2024 JAB Maui Symposium

Event Schedule

Sat, Jan 27, 2024

3:00 PM

Registration Open
3:00 PM - 5:00 PM, Jan 27
Aulani Foyer
General Meet…

6:00 PM

Welcome Rooftop Reception
6:00 PM - 8:00 PM, Jan 27
Pacific Terrace
General Meet…

Join us on the rooftop as we kick-off the 46th Annual Symposium. Food and Entertainment provided.

Sun, Jan 28, 2024

6:00 AM

Registration Open
6:00 AM - 11:59 AM, Jan 28
Aulani Foyer
General Meet…

6:30 AM

Breakfast Symposium: Beyond Burns: Closing Challenging Full-Thickness Wounds with RECELL® Spray-On Skin™ Cells
6:30 AM - 7:30 AM, Jan 28
Puakenikeni Room
General Meet…

Speaker

Derek Bell
Professor of Surgery, Division of Plastic and Reconstructive Surgery; Professor of Orthopaedic Surgery; Director-Kessler Burn Center
University of Rochester

7:00 AM

Continental Breakfast
7:00 AM - 8:00 AM, Jan 28
Aulani Foyer
General Meet…

7:40 AM

Welcome by Dr. Paul Glat
7:40 AM - 7:45 AM, Jan 28
Pikake I & II
General Meet…

Speaker

Paul Glat
Chief of Plastic Surgery, Director of the Burn Unit, Professor of Surgery
St. Christopher's Hospital for Children, Drexel University College of Medicine

7:45 AM

Updates in Plastic Surgical Management of Advanced Hidradenitis Suppurativa
7:45 AM - 8:00 AM, Jan 28
Pikake I & II
Reconstructive/Pla…

Introduction

Severe hidradenitis suppurativa patients who present with chronic, fibrotic, and tunneled disease represent a difficult clinical challenge. These hidradenitis wounds are often refractory to dermatologic management and have underlying heavy microbial colonization. Surgical excision of the hidradenitis with plastic surgical reconstructive procedures may represent the only curative option. However, the rate of recurrence and complications after surgery remains high. We share our experience with a comprehensive treatment plan including operative resection, wound irrigation, and varied plastic reconstructive surgical techniques, which have led to low recurrence and high surgical success rates.

Methods

We present multiple plastic surgical patients, their regions of hidradenitis and stage of disease, surgical excision and reconstruction operative techniques, postoperative wound management techniques, and time to complete healing. In addition, we present several illustrative cases with videos of different operative techniques.

Data was collected by retrospective review of select operative patients with Hurley Stage 3 hidradenitis suppurativa treated with surgical excision and various plastic surgical complex closure, skin graft and flap techniques at one academic hospital by a single academic plastic surgeon. In addition, patients' demographics, comorbidities, and operative cultures were reviewed. Outcomes were assessed at discharge from postoperative care in the outpatient wound center based on presence of any recurrent hidradenitis and healing outcomes of the surgical sites.

Results

There were zero postoperative infections. There were several patients with mild wound healing complications who required postoperative wound management, however each of these patients healed satisfactorily with resolution of their hidradenitis in the operative regions. Other patients all healed uneventfully within the standard accepted postoperative time periods.

Discussion

Severe hidradenitis suppurative excision, wound irrigation, and perioperative care were similar among patients, but reconstructive procedure selection remained variable depending on the disease and patient factors. High surgical success rates were seen with this integrated protocol.

References

1. Taylor EM, Hamaguchi R, Kramer KM, Kimball AB, Orgill DP. Plastic Surgical Management of Hidradenitis Suppurativa. *Plast Reconstr Surg*. 2021;147(3):479-491. doi:10.1097/PRS.0000000000007677
2. Hamaguchi R, Wearda TL, Volk AS, et al. Surgical Management of Hidradenitis Suppurativa: A Two-Center Retrospective Study. *Plast Reconstr Surg*. 2022;150(5):1115-1127. doi:10.1097/PRS.0000000000009658
3. Panayi AC, Matar DY, Haug V, Wu M, Orgill DP. Characteristics and Outcomes of Patients Undergoing Surgical Management of Hidradenitis Suppurativa: An ACS-NSQIP Data Analysis. *Adv Wound Care (New Rochelle)* . 2023;12(5):256-268. doi:10.1089/wound.2021.0132

Speaker

Abigail Chaffin MD, FACS, CWSP, MAPWCA
Professor of Surgery and Chief, Section of Plastic Surgery. Program Director - Tulane University/Ochsner Clinic Plastic Surgery Residency Program
Tulane University

8:00 AM

Pure Hypochlorous Acid Wound Cleanser for Treatment of Burn Wounds

8:00 AM - 8:15 AM, Jan 28
Pikake I & II
Topical Treatm…

Wound Cleansers with antimicrobial preservative ingredients are frequently used to gain local control of wound bioburden. While killing of germs in wounds with high degree of efficacy is not difficult per se, to do without collateral damage to cells is difficult. The concept of theoretical index can be well applied to this area, and rigorous scientific experiments show that one particular ingredient, pure hypochlorous acid, has a high therapeutic index and thus a high margin of safety. Also known is research showing that longer than instant or transient exposure is needed where complex, adherent microbial colonies and their associated slime like material (composed of bacterial proteins and DNA) need to be removed. This is achieved via soaking, but the material with which soaking is done also matters, as does the extent of soaking. Pure hypochlorous acid also seems to have a short half-life in contact with tissue, and the lack of residual efficacy in this case is beneficial to cellular health. Some of the recent science behind this data will be explained. Another effect of the material is to augment mechanical debridement of the wound, which is seen best with the system of instillation. The science behind the empirical observations in this respect will be explained.

Speaker

Gregory Schultz
Professor Emeritus
University of Florida

8:15 AM

Use of SPY™ Imaging (ICG) to evaluate Ovine Forestomach Matrix graft integration in complex wounds: Early Experience

8:15 AM - 8:30 AM, Jan 28
Pikake I & II
Skin Substit…

Background:

Indocyanine green fluorescence imaging is a well-known, and useful tool for evaluating tissue perfusion in reconstructive surgery. It is unique in that it provides intra-operative real-time assessment of microvascular blood flow. We present our early experience with use of (ICG) imaging post-surgery to follow the progress of revascularization and subsequent incorporation of ovine forestomach matrix (OFM)† soft tissue bioscaffold.

Methods:

ICG Imaging SPY-PHI™ was performed on recipient bed tissues prior to the application of OFM graft and again at subsequent post-application follow-up timepoints. Negative pressure wound therapy (NPWT) was applied over the OFM graft with a protective petroleum-based contact layer. Various full-thickness wounds such as traumatic wounds, pressure injury, and necrotizing soft tissue infections were included to evaluate the rate and extent of revascularization. Upon removal of the NPWT, the OFM graft was noted to be adherent to the underlying tissue with a robust vascularized appearance and the wounds progressed toward closure.

Results:

Early experience demonstrates that ICG Imaging may provide a reliable method for assessing the perfusion of incorporated grafts and overall wound healing trajectory in full-thickness wounds.

Speaker

Anthony N Dardano DO FACS
Chief, Plastic Surgery Trauma
Plastic Surgery Trauma Associates LLC

8:30 AM

Hawaiian Welcome Ceremony

8:30 AM

Hawaiian Welcome Ceremony

8:30 AM - 8:45 AM, Jan 28

Pikake 1 & II

General Meet…

8:45 AM

Burn assessment with multispectral imaging and AI: interim analysis of a multicenter study

8:45 AM - 9:00 AM, Jan 28

Pikake 1 & II

Technolo…

Introduction

Early and reliable assessment of burn severity is critical for better management of burn patients. Typically, these estimates rely on the clinician's judgment, gained over years of experience, to discriminate deep partial-thickness and full-thickness burn areas (aka, non-healing burns) from healing areas within the wound. Independent studies have shown that burn specialists have an accuracy of about 70-80%, which drops to 50-60% for non-specialists like emergency physicians. The 20% to 30% ambiguity difference plays a significant difference in the clinical decisions which ripple through the patient's treatment path all the way to recovery. The effects on delivery of care are amplified if the patient-journey starts in the emergency room and transfers to a burn center. Furthermore, a sudden influx of burn patients in a mass casualty event would only exacerbate the situation.

To provide a reliable mode of burn depth assessment, we are investigating a non-invasive, multispectral imaging methodology augmented with artificial intelligence (AI) that automatically highlight non-healing areas within the burn image. Ultimately, we aim to develop this imaging device to provide reliable guidance and validate that guidance generated by AI-algorithms are relevant in clinical evaluation due their significantly higher accuracy than the current standards of visual clinical judgement.

Currently, a translational clinical study is underway to train the detection models and establish the ground truth across a body of real-world data to fine-tune encoded AI. The current work comprises an interim analysis of the ongoing translational study to collect the data required to build the AI-models.

Objective

The objective of this translational study was to determine the agreement between an AI analysis of multispectral images for non-healing burn and the ground truth at the area of non-healing burn, informed by follow-up burn assessment, in a cohort of burn patients from 11 study sites.

Methods

In a multi-center, IRB-approved study (NCT05023135), a multispectral imaging device) was used to image adult and pediatric (<18 y.o.) subjects with thermal burn injuries at 11 burn centers. Subjects were enrolled and imaged within 72 hours of injury, then serially imaged until seven days post-injury. Device AI-outputs were not presented to clinical staff and, at the discretion of the attending surgeon, burn wounds were either allowed to heal spontaneously or surgically treated.

Following all image collections, subjects were followed-up to obtain an accurate diagnosis of burn depth—subjects treated surgically received multiple punch biopsies at surgical intervention and pathology reports detailing histologic changes; and subjects treated with wound care returned for a healing assessment at 21-days post burn injury. After follow-up, an independent panel of at least three burn surgeons developed a consensus determination of non-healing burn areas within each multispectral image—known as the "ground truth". To accurately annotate these non-healing regions within every multispectral image from the subject, the panel reviewed the subject's biopsy results or day-21 healing assessment.

Using multispectral images and the ground truth, an ensemble of 19 convolutional neural networks (CNNs) was trained to highlight non-healing burn tissue within the image. Performance of the ensemble of CNNs was calculated using cross-validation at the level of the subject.

Results

At this interim time-point, 1,359 multispectral images have been collected from 162 subjects including 134 adults and 28 pediatrics. Metrics of agreement between the ensemble of CNNs and the ground truth indicated the algorithm correctly identified non-healing burn tissue with 92±1% accuracy, 90±3% sensitivity, and 93±1% specificity. There have been no adverse events related to the device in the current cohort of subjects.

Conclusions

Historically, burn wound assessment has been dependent on the training and experience of the individual clinician. Our interim results demonstrate improved accuracy, sensitivity, and specificity for non-healing burn areas relative to that of current and historical burn providers. Furthermore, this study is expanding the clinical image dataset for AI-model development including data across the spectrum of patients' skin type, age, burn depth, and burn location that is needed to reinforce AI generalizability. Future studies will focus on validation and implementation in clinical workflows targeting improved burn wound assessment for surgeons and emergency medicine providers.

Funding

This project has been supported in whole or in part with federal funds from the Department of Health and Human Services; Administration for Strategic Preparedness and Response; Biomedical Advanced Research and Development Authority, under Contract No. 75A50119C00033. The findings and conclusions in this presentation have not been formally disseminated by the Department of Health and Human Services and should not be construed to represent any agency determination or policy.

Speaker

Jeffrey Thatcher
Chief Scientist
Spectral MD, Inc.

9:00 AM

Toxicology Screening Burn Population

9:00 AM - 9:15 AM, Jan 28

Pikake 1 & II

Msc./Economy/Basic S…

Objective

Studies in the trauma population document the presence of illicit drugs in 40-80% of admissions. This prospective study was designed to determine the incidence of active pre-hospital substance abuse in patients admitted with a burn injury, document the patient demographic, injury pattern, and treatment requirements.

Methods

We conducted an IRB approved prospective study and obtained a urine toxicology screen on all adult burn admissions, determined prevalence of pre-burn substance abuse, and compared outcomes between the toxicology positive and negative groups to include burn size, number of surgical interventions, and length of stay.

Results

Over a three-month period, fifty-two consecutive patients with acute burns between the ages of 22- and 74-years old (median 44 years) were admitted and treated. Twenty-eight patients met eligibility criteria. Patient demographics and baseline characteristics are summarized in Table 1. Etiology of the burn was flame (17), contact (5), chemical (3), electrical (2), and scald (1). Urine toxicology screens were positive in 22 patients for the specific drugs listed in Table 2. Patients were admitted to the burn floor (17), intensive care unit (10), and one was taken directly to the operating room. Tetrahydrocannabinol (THC) positive patients averaged a statistically significant smaller TBSA burn than THC negative patients (2.9% v 16.6%, p=.02). UDS positive patients were more likely to be admitted during daylight hours (90% v 39%), trended toward a younger age (37 v 44, p=.07)) and required more operative interventions (0.78 v 0.57, p=.29).

Conclusions

Illicit drug use is prevalent in the burn population and should be addressed in educational and outreach programs directed at reducing burn injury. THC was the most frequently abused drug in our study group and pre-hospital THC exposure resulted in a smaller overall burn yet similar resource utilization.

Table 1. Patient characteristics.

	Median	Mean	SD
Height	176 (cm)	174 (cm)	± 10
Weight	86.5 (kg)	86 (kg)	± 21
BMI	28.2 (kg/m^2)	28.7 (kg/m^2)	± 6.6
Prealbumin	15.5 (mg/dL)	17.5 (mg/dL)	± 8.4
TBSA Total	4 (%)	12 (%)	± 22
2nd degree	2.4 (%)	5 (%)	± 6
3rd degree	0 (%)	7 (%)	± 20

SD – standard deviation

Table 2. Drugs resulting in positive toxicology screen

Drug	Threshold Concentration	No. Positive (%)
Acetaminophen/Paracetamol	5 µg/mL	9 (32)
Amphetamines	1000 ng/mL	1 (4)
Methamphetamines	1000 ng/mL	0 (0)
Barbiturates	300 ng/mL	0 (0)
Benzodiazepines	300 ng/mL	6 (21)
Cocaine	300 ng/mL	1 (4)
Methadone	300 ng/mL	0 (0)
Opiates	300 ng/mL	19 (68)
Phencyclidine	25 ng/mL	0 (0)
THC	50 ng/mL	8 (29)
Tricyclic Antidepressants	1000 ng/mL	1 (4)
Oxycodone	100 ng/mL	8 (29)

Speaker

Kurt Stahlfeld
PGY 3 Surgery resident
UPMC Mercy

9:15 AM

A Systematic Review of the Clinical Use of a Single-Layer Bovine Collagen-Elastin Acellular Dermal Matrix

9:15 AM - 9:30 AM, Jan 28
Pikake I & II

Topical Treatm…

Introduction

Dermal substitutes have significantly changed the practice of caring for acute and chronic wounds and earned a place on the reconstructive ladder. The single-layer acellular dermal matrix composed of bovine elastin and collagen types I, III, and V (CEM), was developed in the 1990's, has been commercially available outside of the US since 2005, and received FDA clearance for use in the US in 2021. The objective of this study was to review published literature systematically to summarize the clinical utility of CEM.

Methods

A search of PubMed and Google Scholar was performed utilizing the terms "collagen-elastin matrix" and the trade name. The identified manuscripts were further screened to identify clinical cases describing use of CEM. Manuscripts were excluded if they were primarily animal or in vitro studies, reviews or expert opinion articles, or sufficient details could not be extricated. Google Translate was utilized when necessary.

Results

Five-hundred thirty-five manuscripts contained potential details of CEM usage. After exclusions, 128 remained (13 randomized control trials, 29 cohort studies, and 86 case series/reports) originating from 38 countries and includes nearly 2,600 clinical cases, dating back to the 1990's. Cases varied considerably and included: burns and acute traumatic injuries, chronic wounds, and soft tissue reconstruction in patients ranging from pediatric to the elderly. A one-stage procedure with skin graft overlay was the most common reported technique, but autograft application in a second procedure was also reported in some cases of significant tissue defects. Negative-pressure wound therapy was utilized in 28% of the studies. Studied outcomes also varied widely and included: graft take, several objective scar scales, cutometer and durometer measures, patient satisfaction scores, and histopathology. Studies resulting in less favorable outcomes noted two-stage with long delays before grafting or lack of subsequent grafting, high pre-graft infection rates, ala rim reconstruction, and application on deperiosteated bone.

Conclusions

There is an extensive body of global literature dating back to the 1990's documenting CEM successfully utilized as a dermal matrix for a vast number of patients and indications.

Speaker

David Hill
Clinical Pharmacist / Director of Burn Research
Regional One Health

9:30 AM

Long-Term Follow up of Limb Salvage in the Diabetic Patient with End Stage Renal Disease using Endovascular Revascularization and Free Flap Reconstruction

9:30 AM - 9:36 AM, Jan 28
Pikake I & II

Reconstructive/Pla…

Background: Microvascular surgery plays an indispensable role in the reconstructive process of limb salvage. However, microsurgery in the patient with renal disease is still considered a high-risk procedure. Combining endovascular revascularization with free flap coverage is at present one of the treatment methods for complex soft tissue defects in the ischemic lower limb. The long term follow up of the diabetic foot salvaged using endovascular revascularization and free flap reconstruction is encouraging, but the early and long-term limb salvage rate and patient survival rate in diabetic patients on hemodialysis who had undergone endovascular revascularization and free flap reconstruction are unknown.

Methods: A retrospective review of all diabetic patients with end-stage renal disease on hemodialysis who undergone endovascular revascularization and free flap surgery for lower limb salvage at Dalin Tzu Chi General Hospital was included in the study. Data were collected over a 12-year period, between December of 2010 and December of 2022.

Results: A total of 61 patients were included in this study, of which 38 were men and 23 were women. The average age of the patients was 61 years. All had a history of diabetes mellitus with peripheral vascular disease. The total flap survival rate was 87%. The one, two, and five year limb salvage rates were 63%, 50%, and 27%. The one, two, and five year patient survival rates were 68%, 53%, and 29% respectively.

Conclusions: The present study shows that the results of limb salvage and patient survival in the long-term follow up in this particular group of patients are poor.

Greater effort in the prevention of such severe infections is required in this group of patients to ensure an improved patient survival rate.

Speaker

Honda Hsu
Associate Professor
Dalin Tzu Chi Hospital

9:36 AM

Impossible Abdomens and Difficult Patients: Treatment with NovoSorb Biodegradable Temporizing Matrix (BTM) for Frozen Abdomen

9:36 AM - 9:42 AM, Jan 28
Pikake I & II

Skin Substit…

Abstract: Open abdomen (OA) can be a life-saving surgical strategy following laparotomy to prevent abdominal compartment syndrome as well as facilitate damage control and re-exploration. Unfortunately, maintaining an OA increases the risk of developing intra-abdominal and abdominal wall adhesions that ultimately challenge delayed abdominal closure. Managing patients with severe fixation of intra-abdominal contents, known as frozen abdomen, often creates a vicious cycle of tissue injury that further prolongs OA resolution. In this case report, we share the management course of a 28-year-old male status post motor vehicle accident (MVA) with late presentation vascular injury requiring resuscitative endovascular balloon occlusion of the aorta (REBOA) as well as various abdominal solid and hollow organ injuries. Following initial exploratory laparotomy, he was left with an OA and subsequently developed a frozen abdomen with liver and large area of granulated bowel in addition to an entero-atmospheric fistula. The exposed granulated bowel and fistula limited options for abdominal closure and ostomy appliance placement. In this situation, autografting would likely fail given the inability to control fistula output, and Vicryl mesh would not allow an ostomy appliance to seal nor completely protect the bowel from further fistula formation. NovoSorb Biodegradable Temporizing Matrix (BTM) applied to the granulated bowel allowed an ostomy appliance to be placed around the fistula on top of the silicone layer of the Novosorb BTM. This protected the exposed bowel and facilitated output control of the fistula with an ostomy bag. Because Novosorb BTM is resistant to infection, contamination by the fistula did not hinder eventual incorporation of the Novosorb BTM. With this approach, eventual fistula closure was achieved, and appropriate granulation tissue had formed prior to autografting. For the last few years, NovoSorb BTM has been used to treat various open wounds that span significant total body surface areas. To our knowledge, this is the first report utilizing NovoSorb BTM to aid in the closure of OA in the setting of frozen abdomen with entero-atmospheric fistula.

Speaker

Riana Cerceo
Resident Physician, PGY3
Arrowhead Regional Medical Center-Kaiser San Bernardino

9:42 AM

The Impact of Sleep on Wound Healing

9:42 AM - 9:48 AM, Jan 28
Pikake I & II

Msc./Economy/Basic S…

Sleep plays a crucial role in the body's ability to heal wounds. It is one of the six basic pillars of a healthy lifestyle, along with plant-based nutrition, physical activity, stress management, social connectedness, and passion. Adequate and restful sleep is essential for the overall functioning of the immune system and various physiological processes involved in wound healing. Here's how sleep affects wound healing:

Stress Reduction: Lack of sleep can increase stress levels, which in turn can hinder the body's ability to heal. Chronic stress can lead to elevated levels of cortisol, a hormone that can impede the wound healing process.

Inflammation Control: Sleep helps regulate inflammation in the body. Lack of sleep increases the cortisol which causes chronic inflammation, which can delay the healing process.

Cellular Repair: During the deep sleep stages, the body undergoes the repair and regeneration process. This includes the repair of damaged tissues and the production of new cells. Additionally, cortisol is a catabolic steroid that induces tissue degradation that compromises the wound healing process.

Immune Function: Sleep is important for maintaining a healthy immune system. During deep sleep, the body releases cytokines, which are proteins that help regulate the immune response. These cytokines are essential for the body's ability to fight off infections and inflammation, both of which can impede wound healing.

Pain Management: Sleep can also aid in pain management. Quality sleep helps reduce the perception of pain, making it easier for the body to cope with the discomfort associated with wounds. This can lead to a more restful and less stressful recovery period.

Blood Flow: Sleep is associated with changes in blood flow and blood pressure. Cortisol increases blood pressure and impairs blood flow that is essential for transporting nutrients and oxygen to the wound site, which is crucial for healing.

To optimize wound healing, lifestyle medicine approach is the whole person approach. Every pillar of a healthy lifestyle affects the wound healing process. In particular, sleep is an integral part of the body's natural healing processes. It's important to prioritize good sleep hygiene to support the healing process.

Speaker

Jengyu Lai, DPM, DipACLM
Chief Manager
Rochester Clinic

9:48 AM

Morning Break in Exhibit Hall

9:48 AM - 10:15 AM, Jan 28

General Meet…

10:15 AM

The Treatment of Paediatric Burns and Complex Wounds with Acellular Fish Skin

10:15 AM - 10:30 AM, Jan 28
Pikake I & II

Skin Substit…

The optimal therapy for mixed superficial partial-thickness burn wounds and deep dermal wounds is based on the early debridement of necrotic tissue followed by active wound coverage to optimize scar-free healing. Recently, an alternative resource for burn medicine treatment has become available in the form of acellular fish skin (KerecisTM Omega3®), which was approved for chronic wounds by the FDA in 2013. The structure of fish skin, in this case of north Atlantic cod (*Gadus morhua*), is very similar to that of human skin, and gentle processing allows it to retain its nutrients, including omega-3 polyunsaturated fatty acids, providing potential anti-inflammatory and antimicrobial benefits in addition to antiviral, hypoallergenic, and analgesic effects.

We herein report our experience with this treatment approach for pediatric partial-thickness and full-thickness burns, as well as for complicated and chronic wounds. In particular, we highlight good indications, describe wound healing processes, and offer practical advice for everyday use.

We find that deep dermal burn wounds treated with fish skin demonstrate accelerated wound healing. Specifically, we grafted fish skin onto single, circumscribed, deep dermal burn wounds in children for whom autologous split-thickness skin grafting was indicated as an alternative. All patients presented undisturbed wound healing and very good clinical results with minimal scarring.

At our pediatric burns center, we also regularly treat children with blistering skin conditions, such as epidermolysis bullosa, and we have gained initial experience in using acellular fish skin to treat these patients' very painful chronic wounds. We find that this treatment leads to improved wound healing, although full healing cannot be achieved due to the underlying condition.

We consider fish skin a useful addition to our treatment repertoire for pediatric burns and complicated wounds and call for further experience and clinical studies involving this approach.

Speaker

Katharina Schriek
Consultant in Pediatric and Neonatal Surgery, Representative of the Pediatric Burn Center
Pediatric Hospital Auf Der Bult, Hanover, Germany

10:30 AM

Repigmentation of stable vitiligo lesions using autologous skin cell suspension

10:30 AM - 10:45 AM, Jan 28
Pikake I & II
Skin Substit…

Introduction: Vitiligo is an acquired depigmenting skin condition characterized by the loss of skin pigmentation, impacting 0.5% to 2% of the global population. While there are medical treatment options available, these can be associated with poor efficacy and low medication complianceResidual lesions after treatment may require surgical intervention which allows for melanocyte transplantation from an area that is pigmented to one that is lacking functional melanocytes. Through a point-of-care device, a non-cultured autologous skin cell suspension (ASCS) can be prepared using a small skin sample at a 1:20 expansion ratio. The ASCS contains healthy melanocytes and is immediately applied onto skin treated with ablative laser followed by NB-UVB.

Objective: To evaluate a one-time application of ASCS for the safe and effective repigmentation of stable vitiligo lesions.

Methods: A randomized, within-subject controlled, central observer-blinded study was conducted to compare the clinical performance of laser ablation, ASCS, and NB-UVB to NB-UVB alone for repigmentation of stable vitiligo lesions in adults. Subjects received NB-UVB phototherapy on both ASCS-treated and controlled lesions as per recommended by the Vitiligo Working Group. Repigmentation of ASCS-treated and control lesions were categorized by a Central Review Committee (CRC) of blinded dermatologists as one of the following: 0%-25%, 26%-50%, 51%-79%, or 80-100%. The primary effectiveness endpoint was defined as the proportion of lesions achieving ≥80% repigmentation for ASCS-treated versus control areas at Week 24. Early regimentation was assessed at Weeks 4 and 12 as a post hoc analysis.

Results: A significantly higher proportion of the ASCS-treated areas (36.0%, n = 9) compared to control-treated areas (0.0%) attained ≥80% repigmentation at Week 24 (*P* = 0.012). At Week 4, 30.4% (n = 7/23) of ASCS-treated areas had ≥26% repigmentation compared to 4.3% (n = 1/23) in the control areas. At Week 12, 56.5% (n = 13/23) of ASCS-treated areas had ≥26% repigmentation, compared to 21.7% (n = 5/23) in the control areas. At Week 24, 64% (n = 16/25) of ASCS-treated areas had ≥26% repigmentation compared to 28% (n = 7/25) in the control areas.

Conclusion: Laser ablation of stable vitiligo lesions coupled with ASCS and NB-UVB resulted in superior repigmentation results by 24 weeks, with many subjects seeing repigmentation begin as early as 4 weeks.

Speaker

Steven A. Kahn
Professor of Surgery, Chief of Burn Surgery
Medical University of South Carolina

10:45 AM

Early Use of RECELL in the Management of Extensive Second Degree Burns

10:45 AM - 11:00 AM, Jan 28
Pikake I & II
Skin Substit…

RECELL is a technology being more commonly used to facilitate faster closure of burn wounds, thereby reducing the sequalae associated with open wounds. Here we present a case series of extensive second degree burns where RECELL was used.

Case #1: 20 year old male who sustained 15% Total Body Surface Area (TBSA) superficial to deep 2 nd degree flame burns to the bilateral upper extremities, face, and right thigh from an ATV rollover. He was taken to the OR on post burn day (PBD) #2 where the burns were dermabraded with a Versajet down to confluent dermis. A small split thickness donor site (25cm^2) was harvested from the right thigh to be processed with RECELL device into a suspension of Spray-on Skin cells that were applied directly to all of the burn wounds. Suprathel was applied to the face over the Spray-on Skin cells and Telfa clear was applied to the rest of the Spray-on Skin treated areas followed by xeroform with bacitracin and outer dressings. The entire face dressing was taken down on post operative day (POD) #5 with 95% closure observed. For the extremities, the outer dressings were changed on POD #3 and #5 with a full dressing take down on POD#7 with complete closure except for the right upper arm (375cm^2) which required a split thickness skin graft on PBD# 12. The skin graft had a 100% take and the patient was discharged on PBD#20

Case #2: 31 year old male, with a history of schizophrenia, sustained a 15% TBSA superficial to deep 2 nd degree flame burns to the face, torso, bilateral lower extremities and back from a suicide attempt. He was taken to the OR on PBD#3 where the burns were dermabraded with a Versajet a down to confluent dermis. A small split thickness donor site (25cm^2) was harvested from the right thigh to be processed with RECELL device into a suspension of Spray-on Skin cells that were applied directly to the bilateral lower extremities and torso. The face and back were deferred as they were very small surface areas. Telfa clear was applied over the Spray-on Skin cells followed by bacitracin/xeroform and outer dressing. On POD #3 and #5 outer dressings were changed with a full dressing take down on POD#7, where 95% of the burns were closed. He was then discharged PBD#13

Case #3: 63 year old male sustained 18% TBSA primarily superficial to deep 2 nd degree burns flame burns to the face, bilateral upper & lower extremities after his vehicle catching on fire. He was taken to the OR on PBD#3 where his burns were dermabraded to confluent dermis with an egg burr on a TPS device. A small split thickness donor site (50cm^2) was harvested from the left thigh to be processed with RECELL device into a suspension of Spray-on Skin cells that were applied directly to all four extremities and face. Suprathel was applied to the face and Telfa clear was applied to the extremities followed by xeroform with bacitracin and an outer dressing. The entire face dressing was taken down on POD#5. The outer dressing on the extremities were taken down on POD#3 and #5 followed by a full dressing takedown on POD#7. There was 95% closure on all burns except the left lower extremity (450cm ^{2}) which required additional excision and a split thickness skin graft which was done on PBD#12. The skin graft had about 90% take and remaining small scattered wounds that remained were treated non-operatively. Patient was discharged on PBD#25

Case #4: 19 year old female sustained a 10 % TBSA second degree sun burn to bilateral lower extremities while surfing. She presented to the hospital 6 days post burn. She was taken to the OR on PBD#9 (hospital day #3) where the burns were dermabraded with a Versajet to confluent dermis. A small split thickness donor site (12cm^2) was harvested from the right thigh to be processed with RECELL device into a suspension of Spray-on Skin cells that were applied directly to the burns wounds and covered with Telfa clear followed by xeroform coated with bacitracin and an outer dressing. Full dressing takedown was done on POD#6 (PBD#9) with 99% closure observed. Patient discharged that same day.

Conclusion: Use of Spray-on Skin Cells early in a patient's hospitalization for extensive second degree burns can promote faster closure of such burns and reduce need for daily dressing changes and associated pain. Areas that required autografting were likely much deeper burns than initially anticipated. Nevertheless, by applying Spray-on Skin Cells, it allowed demarcation of these deeper areas which reduced the amount of donor site needed for autografting.

Speaker

Syed Saquib
Burn Surgeon/Burn Medical Director
Kirk Kerkorian School of Medicine at UNLV/ University Medical Center Lions Burn Center

11:00 AM

Finite Element Analysis, Porcine Model Preclinical Study, and Proteomic Evaluation of a Novel 7- Day Peel and Place Negative Pressure Wound Therapy Dressing

11:00 AM - 11:06 AM, Jan 28

Pikake I & II

Skin Substit…

Negative pressure wound therapy (NPWT)* with reticulated open cell foam (ROCF)^ has evolved the practice of wound care. To date, ROCF has not been utilized as an extended wear dressing due to the potential for tissue ingrowth that may occur if left in place for >72 hours. This study evaluated a novel, easy-to-use, peel and place dressing† designed to utilize the advantages of ROCF while addressing tissue ingrowth as an extended-wear NPWT dressing.

A finite element analysis (FEA) study was conducted using computer simulation to evaluate the effects of NPWT on tissue deformations produced by ROCF or the peel and place dressing. Based upon clinical assessments and consultations with plastic surgeons, wound models were developed that incorporate dimensional specifications and material properties for the relevant tissue layers(epidermis, dermis, subcutaneous fat, muscle, and bone). In addition, the peel and place dressing was evaluated in a preclinical study utilizing a porcine model. Full-thickness excisional paraspinal wounds were created on the dorsum of 11 swine and continuous negative pressure administered at –125 mmHg for 7 days. The study was designed to assess long term wear; therefore, no dressing changes were performed throughout the 7-day study. The wounds were dressed with either peel and place dressing or ROCF. Biopsies were collected for protein extraction and tissues excised for histology at study termination. The extracted protein was used in multiplex immunoassays to quantify wound healing biomarkers and histologic morphometry measurements determined granulation tissue thickness. The study was approved by an Institutional Animal Care and Use Committee (IACUC) and animal care complied with all applicable national and local regulations.

FEA revealed more homogenous tissue displacements, more uniform tissue tensile strains, larger volume of tissue engagement, and deeper tissue engagement. In the preclinical study, the peel and place dressing promoted significantly more granulation tissue than ROCF ($p<0.05$), and tissue ingrowth was limited to only ROCF-treated wounds ($p<0.0001$). Furthermore, analysis of wound healing-associated cytokines/chemokines and heparin-binding endothelial like growth factor (HB-EGF) also demonstrated differences between treatments. Elevated levels of interleukins (IL)-1α, IL-1β, IL-1ra, IL-8, IL-12, and HB-EGF were also observed in the peel and place treatment ($p<0.05$).

The more homogenous and greater tissue engagement generated by the peel and place dressing, as illustrated by FEA, are likely to have contributed to the elevated levels of wound healing biomarkers observed via mechanical stimulation and associated signal transduction into the cells. The elevated presence of these critical proteins, in turn, supports the greater granulation tissue formation promoted by the peel and place dressing. This outcome, along with mitigated tissue ingrowth, support the effectiveness of the peel and place NPWT dressing for 7-day extended-wear.

Speaker

Kris Kieswetter
Sr Director, Applied Sciences
3M

11:06 AM

Substance Use Screening on Admission to ABA Reporting Burn Centers: An Analysis of National Burn Repository Data

11:06 AM - 11:12 AM, Jan 28

Pikake I & II

Msc./Economy/Basic S…

Objective: Illicit drug misuse/abuse is considered a common risk factor among burn-injured patients, frequently increasing the risk of burn recidivism and drug-seeking behaviors. Premorbid substance abuse has been found to complicate both short – and long-term burn outcomes, supporting the importance of substance use identification early in the treatment process. This study investigated if there were associations between race and decisions to test for drug/substance use upon burn admissions across ABA verified burn centers in the United States, controlling for case demographics, burn severity, and other circumstances associated with patients' burn injuries. Knowledge of pre-morbid drug/substance use is important when treating burn patients due to the increased risk of mortality, morbidity, medical and psychiatric complications, and poor mental health outcomes that are known to be associated with illicit substance use. Yet, there has been little research on how admitting providers determine which burn trauma patients to test for drug/substance use on admission.

Methodology: This study is a longitudinal secondary analysis of 37,355 cases from the National Burn Data Repository (NBR) from 2008 to 2017. The dependent variable was whether a burn cases was screened for drug/substance use, and independent variables were age, gender, whether physical abuse was reported, mental health comorbidities, marital status, the severity of burns, whether the injury was work-related, injury circumstances, and etiology of burn injury. Race and ethnicity were independent variables of focus. used. There were 45,917 White, 18,678 Black, 1,923 Asian, 665 Indigenous, 188 Hawaiian /Pacific Islander, and 6,822 "other" race burn cases. The focus of the current study was on Black and White burn cases. In order to avoid possible issues with large differences in sample size between Black and White cases, a random sample of 18,677 White cases were selected, so the study sample included 18,678 Black and 18,677 White burn cases, for a total of 37,355 burn cases. Missing data were handled with full information maximum likelihood. Binary logistic regression was used to test for the relationship between race and selection for drug/substance use testing, controlling for other independent variables.

Results: The overall test of the model with all independent variables, and only the race-by-comorbidity-with-mental-health interaction term, was statistically significant, $\chi 2 (29) = 10,325$, $p < 0.00001$, with $R 2 = 0.45$, $z = 80.46$, $p < 0.0001$. The test of interaction terms was statistically significant, $\chi 2 (24) = 41.00$, $p = 0.017$. The only interaction term that was statistically significant was the race-by-comorbidity-with-mental- health variable, $z = -2.844$, $p = 0.004$. These results were consistent with the possibility that decisions about assessing burn patients for drug use may be dependent upon the race. While this does not indicate any forms of implicit or explicit race bias, it does suggest that implicit and/or explicit race bias may be a factor is these determinations.

Conclusion: Our study results suggest that demographic profiles may have influenced decisions to screen for drug/substance misuse in reported burn cases. Currently, there are no specific protocols issued by the ABA for substance use testing on admission, introducing a significant risk that those decisions may be influenced by implicit and/or explicit bias. When race and other social determinants of heath influence providers' decisions to screen for drugs, it is more than an issue of social justice, it also an issue of quality of care. Research clearly states that premorbid substance use negatively impacts both short and long-term patient outcomes and knowledge of that abuse is critical to patients' plans of care. We propose that all adolescent and adult patients be tested for substance use on admission to a burn center and that there be continuity in testing across all burn centers. There are many medically sound reasons to identify patients' premorbid substance use and/or intoxication on admission, however race should not be a determining factor.

Speaker

Thereasa Abrams
Assistant Professor
College of Social Work, University of Tennessee

11:12 AM

A novel Copper-Iodine based Wound Irrigation Solution: Breakthrough dual-action ion technology that improves the wound bed environment and safely addresses bacterial and biofilm contamination.

11:12 AM - 11:27 AM, Jan 28

Pikake I & II

Infection

Bioclynse®" Wound Irrigation Solution (WIS) is an FDA 510(k) cleared medical device. The WIS is indicated in wound management, cleansing, irrigating, moisturizing, and debriding of acute and chronic dermal lesions that are partial or full thickness wounds. These indications include 1st and 2nd degree burns, stage I–IV pressure ulcers, diabetic ulcers, stasis ulcers, abrasions and minor skin irritations, post-surgical wounds, grafted and donor sites.

The mechanism of action of Wound Irrigation Solution (WIS) is based on the mechanical action of the pressurized fluid coming from the dispensing container or through a pulsed lavage system which moves across the wound surface aiding in the removal of contamination or foreign objects such as dirt and debris, including microorganisms. The WIS preservative in solution is based on a powerful yet safe copper-iodine technology that releases a tailored amount of free iodine, I2 (up to 250 ppm), which along with copper ions helps to remove contamination within the solution and produce a combined effect that assist cleansing, irrigating, and debriding of wounds.

This unique dual action Copper-Iodine ion acting as a preservative in solution has the capacity to neutralize a broad number of pathogens such as bacteria, viruses, yeast, and fungi without evoking bacterial resistance1-4. Free Iodine (I2) is a recognized powerful and broad-spectrum antimicrobial with no known resistance that exhibits multiple mechanisms of action, including: (i) penetration into the cell wall of the microorganism, causing blocking of the hydrogen bonds and resulting in damage to the phospholipid cell membrane, (ii) and damage and denaturing of the essential proteins, nucleotides and fatty acids by binding to thiol and amine groups, leading to rapid cell death.

Augmenting the effects of iodine, copper ions and their complexes serve as an additional synergistic antimicrobial tool of the WIS preservative technology. The antibiofilm properties of copper and its mechanisms have been well documented in scientific publications7-10. Copper ions are known to exhibit redox properties able to produce a multi-mechanism antimicrobial activity like that of iodine (binding to several cell structures). Copper ions permeabilize the cell membrane of the microorganism by generation of free radicals that promote membrane lipid peroxidation and subsequent damage and leaking of the key cell components6 . Other antimicrobial mechanisms published in the literature include promotion of changes in the conformational structure of nucleic acids (e.g., DNA mutations and RNA degradation) and proteins as well as interference with oxidative phosphorylation and osmotic balance. This capacity of copper ions to bind to and alter other biological structures make it very effective in disrupting and weakening the biofilms protective coating, allowing greatly increased antimicrobial efficacy8-11. WIS has been proven to be non-cytotoxic, non-pyrogenic, non-irritating, and non-sensitizing to dermal tissue.

WIS can be applied directly to the wound bed to flush debris and particulate matter to ensure adequate cleansing. It is fully compatible with static or pulsed lavage, ultrasonic debridement and negative pressure wound therapy (instillation mode). Significantly, WIS does not need to be rinsed after treatment or application, whether used in a static or dynamic mode, thereby increasing efficacy, and reducing treatment times and additional costs.

The purpose of this presentation is to discuss the quantitative findings of the Wound Irrigation System (WIS) on bacteria, yeast, fungi, and SARS-CoV-2 virus in an in vitro model. Furthermore, the data and efficacy of WIS will be reviewed using common implant material substrates (silicone and titanium) an in vivo porcine model.

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Speaker

Steven J. Kavros, DPM
Advanced Wound Healing, Limb Preservation
Vascular Surgery Associates

11:27 AM

Business of Burns Panel

11:27 AM - 12:00 PM, Jan 28
Pikake I & II
Msc./Economy/Basic S…

Speakers

Steven A. Kahn
Professor of Surgery, Chief of Burn Surgery
Medical University of South Carolina

Bill Hickerson
AccessPro Medical

12:30 PM

Lunch Symposium: PolyNovo: Troubleshooting Complex Wounds: A Discussion Based Symposium

12:30 PM - 1:30 PM, Jan 28
Pikake I & II
General Meet…

Mon, Jan 29, 2024

6:30 AM

Registration | Information Desk Open

6:30 AM - 12:00 PM, Jan 29
Aulani Foyer
General Meet…

Breakfast Symposium: Vericel: The ABCs of NexoBrid® (anacaulase-bcdb): Advancing Burn Care

6:30 AM - 7:30 AM, Jan 29
Puakenikeni Room
General Meet…

Topics presented will include:

- Presentation of NexoBrid product background, clinical trial data, and application
- Case presentations and product use considerations

Speaker

Steven A. Kahn
Professor of Surgery, Chief of Burn Surgery
Medical University of South Carolina

7:00 AM

Continental Breakfast

7:00 AM - 8:00 AM, Jan 29

Exhibit Hall

General Meet…

8:00 AM

Acute and Post Burn Reconstructive Surgery of the Female Truck with Artificial Dermis to Facilitate Healthy Pregnancy

8:00 AM - 8:15 AM, Jan 29

Pikake I & II

Skin Substit…

IntroductionThe sequelae of deep and extensive burns to the abdomen can lead to serious complications during pregnancy. Studies and publications covering this subject are scarce and outdated. The complications described arise during the 3rd trimester of pregnancy, and surgical treatments to address these complications can initiate premature labor with a risk of fetal demise. We felt it would be of interest to prevent these complications through surgical treatments performed before the pregnancy. The need to reconstruct large regions of abdominal scar tissue prompted us to turn to dermal equivalent for preventative surgical treatments.

Materials and method

Four patients were treated with equivalent dermis: one during the initial phase of the burn and three during reconstructive surgery for burn scarring. Three were grafted with Integra, and one with Matriderm.

The first patient is a 24-year-old female with expansive, deep scar tissue of the trunck resulting from a burn at 9 months of age. The scars had caused inelasticity of the abdomen, pelvic contraction and had arrested the breast development. Scars contractures were excised in two surgical procedures and Integra® grafts were performed immediatly. The second patient, 26 years of age, was scalded at the age of 3. The initial burns affected 60% of the total body surface area. The after-effects of the burns consisted of hypertrophic retractile sequelae most notably in the form of circular scar tissue around the abdomen and the lower back, as well as inguinal and perineal contractures. To repair the abdomen and inguinal region, the scar tissue was excised and grafts of Integra dermal equivalent were applied. The third patient is a 28 year Old female with a 3rd degree abdominal burn. The death tissues were excised on day 7 post burn and Integra was grafted during the same surgical procedure. Following regeneration of the dermal layer within the Integra® matrix the silicone layer was removed and epidermal grafts were performed to complete the healing and closure of the dermal surface. The fourth patient, aged 24, had burns of the trunk, perineum and thighs, which made it impossible to abduct the lower limbs. Reconstructive surgery consisted firstly in releasing the scar tissue from the trunk, and secondly from the lower abdomen, perineum and then the thighs. Matriderm was the equivalent dermis chosen for these surgeries.

Results

The surfaces grafted with Integra dermis were 2 x 1250 cm² for the first patient, 2 x 1000 cm² for the second patient, and 1750 cm² for the third patient. Epidermization occurred on the 20th day after dermal grafting, during the second surgical stage for each of the three patients. We did not observe any loss of graft tissue or any complications of hematoma or infection. The surfaces grafted in a one step surgery with Matriderm were respectively 624 cm²for the first surgery and for the second surgery and 2x624 cm² for the third surgery. The long-term postoperative Vancouver scores were 3 for the first patient and 2 for the three others.

Excision of the thoracic scar tissue in the first patient revealed mammary glands that were present, but atrophied. After being freed from their adherences, they were repositioned and then covered with Integra dermis. Their growth was normal throughout the pregnancy. No engorgement from lactation was observed. All four deliveries were uncomplicated, full-term, and vaginal. Following the pregnancies, the abdominal walls returned to their place and the Vancouver scores remained 3 and 2, thanks to the suppleness of the skin that had been achieved. After pregnancy, the breasts of the first patient retained a normal shape and volume. Only the areolas are absent and will need to be reconstructed.

Discussion

Abdominal scar sequelae can be unproblematic during a pregnancy that is already underway when scar tissue is limited or if, during the initial treatment, a total skin graft was performed. In the absence of surgery, the main side effects encountered are abdominal inelasticity and painful symptoms during the 3rd trimester Abdominal inelasticity may cause the uterus to ascend, resulting in compression of the diaphragm and dyspnea. The consequences of abdominal inelasticity can be very serious if inelasticity provokes premature labor or needs to be surgically released. When releasing incisions are performed to address abdominal compartment syndrome, there is an associated risk of fetal demise. When a patient with large, inelastic abdominal scar tissue wishes to become pregnant, and total skin grafts or grafts of skin flaps cannot be performed, dermal equivalents may be called upon. These dermal equivalents are regularly used during acute surgery of burns and during corrective surgery. Their action results in better surgical outcomes because it prevents the development of large, inelastic scar tissues, and allows for the correction of already developed scars. Since large grafts of artificial dermis are immediately available, it is possible to consider treating large surfaces like the abdomen. Consequently, when caring for the 4 patients subject of this series, it was possible to preventively treat scarring complications, by performing a dermal graft at the initial stage of the burn for one of the patients, and by correcting the large areas of scar tissues for the other 3 patients.

Conclusion

Artificial dermis has undeniable benefits because it is simple to use and can be applied to treat large surfaces, at the initial surgical stage of burn care or during the treatment of sequelae. It has, furthermore, enabled physicians to improve their patients' quality of life, when faced with the question that is asked when treating severely burned patients: "You saved their life, but what kind of life have you given them?" Restoring the skin's elasticity and suppleness allows the patient to recover normal functionality in all of life's aspects, including pregnancy.

Speaker

Eric Dantzer
Senior Plastic Surgeon
Instruction Military Hospital Sainte Anne

8:15 AM

Enhancing Wound Healing through Modern Wound Culture Testing

8:15 AM - 8:30 AM, Jan 29

Pikake I & II

Infection

Infections pose a significant challenge in wound management and can impede the healing process. Despite this, wound culture testing remains underutilized, with many practitioners still relying on traditional plating techniques that may overlook uncommon microbes and fail to identify non-bacterial pathogens promptly.

This abstract presents three clinical cases highlighting the transformative impact of modern molecular wound culture tests on wound healing.

Case 1: An 80-year-old Caucasian woman sought diabetic foot care for a wound on her right lower leg, the origins of which were unclear due to dementia. Her primary care provider initiated daily dressing changes for two weeks before a nucleic acid-based wound culture test identified Methicillin-resistant Staphylococcus aureus (MRSA). Subsequent treatment with doxycycline and advanced wound care materials led to significant improvement within ten days, ultimately resulting in complete healing within three weeks.

Case 2: A 79-year-old Caucasian woman presented with a non-healing wound on her left lower leg, which had progressed in size, depth, and drainage over one month. Conventional wound culture results were negative for pathogenic microbes, prompting an investigation into the underlying cause: uncontrolled edema. Adequate compression therapy successfully improved the ulcer.

Case 3: A 63-year-old Caucasian male with chronic ulcers on his sacrum and hip, receiving long-term antibiotic therapy for osteomyelitis, exhibited non-healing ulcers with excessive drainage. Molecular wound culture tests revealed the presence of Pseudomonas in both ulcers, despite presumed microbial control from previous treatment. Adjusting wound bed pH and reducing drainage frequency to every three days resulted in notable improvements.

These cases underscore the significance of assessing the biological load in wound management. The conventional plating method for wound culture testing is inadequate for capturing the diverse wound microbiome. In contrast, modern molecular wound culture tests can rapidly detect bacteria, fungi, and viruses, enabling a comprehensive and timely diagnosis of the causes behind delayed wound healing. The swift identification of pathogens empowers healthcare providers to formulate precise and effective treatment plans, ultimately facilitating optimal wound healing outcomes.

Speaker

Jengyu Lai, DPM, DipACLM
Chief Manager
Rochester Clinic

8:30 AM

Long term aesthetic and functional outcomes of MEEK micrografting.

8:30 AM - 8:45 AM, Jan 29

Pikake I & II

Surgical

Autologous split thickness skin grafting is the standard-of-care for the majority of deep dermal and full thickness burns. Multiple techniques have been described for skin graft expansion, with meshed grafts and micrografting techniques, like the modified MEEK technique being the most used, globally. The modified MEEK technique encompasses the processing of skin grafts into separate skin islands and subsequently introducing a defined distance between these islands in a controlled manner. It is becoming increasingly recognized that the size as well as depth of the donor site with the modified MEEK technique is less than what is needed in the mesh technique when grafting the same size wound with the same expansion ratio. For this reason, especially in larger burns the modified MEEK technique is generally used. Also, the modified MEEK technique is considered a good option in patients in need of a small donor site, because of potential wound healing problems.

Mortality rates of burn patients have decreased with the advances in burn care in the last decades. As a result, the focus of research has shifted towards assessment of the aesthetic and functional outcome as well as quality of life. Studies addressing these (long term) functional as well as aesthetic outcome of both the meshed graft and the modified MEEK technique suggest at least comparable and, in some studies, superior results of the modified MEEK technique. Both observer and patient evaluation of the scars have been studied. This was shown by a prospective comparative randomized study (Noureldin et al. 2022) as well as a cross sectional study (Zhen et al 2019). One of the reasons some specialists might be hesitant to use the modified MEEK technique is the longer procedural time. However, several studies contradict this and claim similar or even shorter procedural time in the modified MEEK technique compared to the mesh technique once the team overcomes the initial learning curve (Dahmardehei et al. 2020, Mishra et al. 2022)

Thus, an increasing number of teams is using the modified MEEK technique with favorable long term aesthetic and functional outcomes, as well as procedural time. Still, it remains beneficial to perform additional high-quality clinical trials to evaluate the comparison of the different expansion techniques. These trials should explore both long term outcome after 2 years and cost effectiveness and especially the patients' opinion.

Speaker

Fenike Tempelman
Medical Advisor
Humeca Inc.

8:45 AM

Physical Activity of Pediatric Burn Patients after Hospitalization

8:45 AM - 9:00 AM, Jan 29
Pikake I & II
Msc./Economy/Basic S…

Introduction: Wearable devices are increasingly being used in healthcare to measure health behavior. Wearable technologies allow clinicians to gather data in a patient's natural settings such as home, work, or school. Decreased activity after burn injury has been shown to have detrimental and life-altering effects. The goal of this study was to objectively measure the activity level of pediatric patients after hospitalization for major burn injury.

Methods: Fitbit activity watches were administered to pediatric patients at discharge from acute hospitalization for burn injury and data was collected for 12 weeks. Total steps, steps per day, and "very active" minutes per day were collected. In addition, adherence with wearing the Fitbit trackers was measured.

Results: Twenty-nine patients were administered Fitbit, Inspire 2 devices. The average TBSA was 21% and the average length of stay was 32.4 days. Patients demonstrated 79% adherence at 1 month, 59% at 2 months, and 38% at 3 months. For those who were wearing the Fitbits at each time point, the average total steps were 42242, 37464, 35632 respectively with 6035, 5352, 5090 steps per day at each time point. The average minutes of the patient being "very active" was 7, 9, 5 minutes per day. Comparison of the reported values to normal, age-appropriate values and statistical analyses will be presented.

Conclusion: After burn injury, pediatric patients demonstrate declining activity for three months after hospital discharge and show low levels of being "very active". Activity trackers allow for remote monitoring of patients' activity levels after discharge. This information can be used to monitor health behaviors after hospitalization and be used to guide more effective follow-up treatments.

Speaker

Ingrid Parry
Physical Therapist, Researcher
Shriners Hospital for Children, Northern California

9:00 AM

A Pallette of Care: Progression in the Burn Center

9:00 AM - 9:15 AM, Jan 29
Pikake I & II
Msc./Economy/Basic S…

Speaker

Anjay Khandelwal
Chief, Division of Burn Surgery; Director, Burn Institute; Program Director, Acute and Reconstructive Burn Fellowship
Akron Children's Hospital

9:15 AM

Advanced Wound Management Using Ovine-Derived Extracellular Matrix: A Year Later

9:15 AM - 9:21 AM, Jan 29
Pikake I & II
Skin Substit…

ding on our initial experiences with the novel ovine-derived extracellular matrix (ECM) technology, this presentation delves into the continued exploration and outcomes of utilizing ovine forestomach matrix (AROA ECM) in managing deep partial thickness burns and full thickness wounds. Over the past year, we have expanded our application of this innovative technology across a broader spectrum of wound types, harnessing the unique properties of the ovine ECM. We have also had the ability for time to pass and allow wound remodeling. Our findings demonstrate enhanced healing dynamics, notable improvements in tissue regeneration, and a reduction in healing time across various cases. The presentation will highlight key case studies that exemplify the practical applications and benefits of this technology, along with a discussion on the manufacturing process that preserves the essential characteristics of the ECM. This follow-up aims to provide deeper insights into the versatility and efficacy of ovine-derived ECM in modern wound management, reaffirming its role as a groundbreaking tool in tissue repair and regenerative medicine.

Speaker

Tracee Short
Burn Surgeon
Traumatic Skin Institute

9:21 AM

Case Series: Use of a Lactide-based Copolymer Skin Substitute Applied at Bedside for Treatment of Superficial Burns

9:21 AM - 9:27 AM, Jan 29
Pikake I & II
Skin Substit…

IntroductionThe ideal skin substitute would be inexpensive, inert, antimicrobial, readily available, easy to apply and use, require few dressing changes, promote healing and be painless. There have been several studies examining the use of a lactide-based copolymer skin substitute in partial thickness burns, focusing on pain reduction, use on donor sites or use in children or the elderly. The purpose of this case series is to demonstrate that bedside application of this skin substitute can result in successful wound closure and decreased length of stay and discuss hospital economics in patients who do not need operative intervention.

Methods

We performed a retrospective chart review of all patients undergoing bedside lactide-based copolymer skin substitute placement from August 2023 to October 2023 at a single ABA verified burn center. Inclusion criteria were patients greater than eighteen years of age with superficial and intermediate depth partial thickness burns. The skin substitute was applied in our hydrotherapy room after the burns underwent bedside debridement. The treated areas were dressed in petrolatum-based gauze and absorbent pads on the trunk; extremities were dressed in petrolatum gauze, gauze rolls and compression wraps. Patients were instructed to either change outer dressings daily or keep dressings clean and dry. Data collected included age, sex, percent TBSA burned, co-morbidities, smoking status, mechanism of injury, length of follow up, length of stay and percent closure.

Results

Thirteen patients were included in this study. Among the patients, nine (69%) were male and the age range was 17 to 76 years of age. Six patients (46%) were smokers and ten (77%) had co-morbidities (hypertension, chronic obstructive pulmonary disease, hyperlipidemia, marijuana use, alcohol abuse, diabetes mellitus, schizophrenia). Four patients (31%) suffered thermal burns, five (38%) scald burns, three (23%) grease burns and one (8%) electrical flash burn. TBSA burned ranged from 1.5% to 8% and areas affected included hands, upper extremities, lower extremities, chest, abdomen, back, flank, buttocks, face, and neck. Time between injury and skin substitute application ranged from zero to eleven days. Length of stay ranged from zero to 14 days, with eight patients (62%) being discharged from the emergency room or within 24 hours under observation. Length of follow up ranged from six to thirty-five days and seven (54%) patients followed up; follow up is pending for three patients (23%), one patient refused follow, one was lost to follow up and one died after discharge, unrelated to his burns. Complete (100%) closure was achieved in seven patients (54%) and near complete closure (98%) in one patient. There was one complete treatment failure and one partial treatment failure.

Discussion

Superficial partial thickness burns will heal with local wound care; barriers to healing include patient compliance secondary to pain with dressing changes. A skin substitute could aid in healing by decreasing pain and simplifying wound care for patients, thus obviating the need for admission or operative intervention. In this case series, we demonstrate the successful use of a lactide-based copolymer in treating superficial to mid dermal partial thickness burns. Despite patient comorbidities or smoking status, most patients achieved 98-100% closure and most patients were discharged from the emergency room or within 23 hours under observation. The two treatment failures occurred in patients who were non-smokers and had no medical co-morbidities. Limitations of this study include its small sample size and lack of a standardized process for application of this skin substitute. Future directions include studying a larger cohort focusing on health economics and performing prospective studies to examine the use of this skin substitute to treat partial thickness burns on an outpatient basis.

Speaker

Ram Velamuri Plastic and Burn Surgery

9:27 AM

A Comparative Study Assessing the Use of Biofilm-Based Dressing Versus Conventional Dressing in the Management of Venous Leg Ulcers

9:27 AM - 9:34 AM, Jan 29

Pikake I & II

Topical Treatm…

Background: Venous leg ulcers (VLUs) represent a significant source of suffering and impacts negatively on patients' quality of life, with some patients experiencing a frustrating cycle of ulceration, healing, and recurrence. These ulcers are often associated with pain, unpleasant odors, and moderate to high levels of exudate. These wounds typically respond inadequately to treatment, and patients frequently endure these ulcers for a year or even longer. In these hard-to-heal wounds, they provide an environment conducive to the proliferation of wound microorganisms, disrupting the skin's natural microbiome, allowing for the formation of Biofilms. Biofilms are now estimated to be as prevalent as 80% in hard-to-heal wounds. They significantly impede the wound healing process resulting in delayed recovery.

The principal objective of this comparative cross-sectional study was to assess the safety and effectiveness of employing a biofilm-based dressing designed to combat biofilm in combination with compression therapy for patients suffering from venous leg ulcers.

Methods: A retrospective analysis of all patients with venous leg ulcers from January 2019 to January 2023. The inclusion criteria included adult patients aged 18 years or older with venous leg ulcers classified as C6 according to the CEAP (clinical severity, etiology, anatomy, pathophysiology) classification. Patients needed to have an ankle-brachial pressure index greater than 0.8. The venous leg ulcers must have persisted for a duration of greater then 1 month, and ultrasound confirmation of varicose veins was required. As the biofilm-based dressings required out-of pocket payment, the patients were randomly allocated into two groups: those who chose the biofilm-based dressing (AQUACEL™ Ag+ Extra) and those who did not (as they could not cover the expenses themselves) and instead chose the conventional form of treatment, as this was covered by the national health insurance. All patients must have used compression therapy in conjunction to either the biofilm-based dressing or with conventional form of dressing. Demographic data collected for the study included information on age, gender, comorbidities, and the necessity for additional surgery. Additionally, a comprehensive description of the wounds was recorded, encompassing their location, duration, and the state of the wound bed.

Results: A total of 59 patients were included in this study, 27 patients used a biofilm-based dressing for their venous ulcers and 32 patients were treated with either wet-to dry dressings or with silver sulfadiazine. The patients that used the biofilm-based dressing showed a better healing rate, a better absolute reduction in wound surface area (measured in square centimeters), a better relative reduction in wound area (measured as a percentage), and increased average speed of wound healing (measured in square millimeters per day), and a better wound surface area reductions of ≥ 40% and ≥ 50% by the end of the 24th week compared to baseline measurements. More patients showed complete ulcer healing rate within the 24 week follow up. The control group showed a higher loss of follow-up, poor ulcer response rate, and rarely achieved complete ulcer healing rate.

Conclusions: The present study showed that compression dressing together with a biofilm-based dressing is effective in the management of chronic venous ulcers.

Speaker

Honda Hsu
Associate Professor
Dalin Tzu Chi Hospital

9:34 AM

Morning Break in Exhibit Hall

9:34 AM - 10:15 AM, Jan 29

General Meet…

10:15 AM

DermiSphere(tm): Advancing the Standard of Care for Full Thickness Tisue Loss Wounds

10:15 AM - 10:30 AM, Jan 29

Pikake I & II

Technolo…

Purpose: Full thickness skin loss is a debilitating problem, most often reconstructed using a split thickness skin graft (STSG), which does not reconstitute normal dermal thickness and often produces suboptimal functional and aesthetic outcomes that diminish a patient's quality of life. To address the minimal dermis present in most STSG, engineered dermal templates were developed that can induce tissue ingrowth and the formation of neodermal tissue. However, clinically available dermal templates are limited by relatively slow vascular ingrowth, which necessitates a 2-3 week interval between surgical device placement and wound closure with STSG in a second surgery, predisposing patients to prolonged inactivity and increased risk of infection. To mitigate the potential complications of this protracted process the novel composite hydrogel scaffold DermiSphere™ was developed. DermiSphere™ optimizes a unique scaffold microarchitecture with native hydrogel properties and mechanical cues ideal for promoting neovascularization, tissue regeneration, and wound healing.

Methods: DermiSphereTM (DS) was fabricated by embedding higher % (w/v) collagen microspheres in lower % (w/v) collagen bulk and allowed to thermally polymerize. We have evaluated DS's in vivo performance in a full thickness porcine skin wound model as well as in high throughput full thickness rat wound model (developed by Fesarius to enable fast, functional screening of our prototypes).

The rat model not only enables us to screen different formulations, but also allows us to evaluate our product's performance in common "challenging" clinical wound scenarios. In such cases, an avascular portion of a wound bed (e.g. exposed tendon without paratenon) does not support scaffold vascularization, resulting in failure of the skin graft over the non-vascularized portion of the dermal template. We mimicked such a scenario by grafting the products over a silicone strip that "blocked" ~30% of the wound bed. The market leading engineered dermal template product was implanted for comparison in all studies.

For the porcine studies Yucatan mini swine were used. Each pig received 8 full thickness skin wounds on the dorsum. Three experimental groups were evaluated: 1) split thickness skin autograft alone at day zero (STSG-only), 2) DermiSphere™ & STSG autograft concurrently at day zero and 3) Integra Bilayer Wound Matrix (INT) at day zero followed by STSG autograft 14 days later (per the INT product IFU). For each group, half of these wounds (N=4) were harvested 7 days post STSG to histologically assess graft "take" (the area of transplanted skin that engrafted) and healing. The remaining (N=4) were allowed to heal for 21 days post STSG and were harvested at study termination.

Results:

Full thickness reconstruction in rat "challenging model": After confirming DS performance in standard skin wounds in a rat (data not shown), we also evaluated respective performance in a challenging wound as mentioned above. Results from a small-scale feasibility rat study (Figure 1), along with histological analysis, clearly suggest that DS was significantly better in terms of supporting the epidermal skin graft (DermiSphere group shows viable, vascularized epidermal graft (~100% take), while market leading INT graft has extensive areas of ischemia (~30% take)). As graft take is directly correlated to the presence and health of regenerated vascularized tissue, these data greatly support the potential of this novel dermal regenerative template.

Full thickness reconstruction in porcine model: H&E staining demonstrated viable split thickness grafts in all groups 7 days after graft placement (POD 7 for DS/STSG and STSG alone, POD 21 for INT/STSG) with functional blood vessels seen throughout both the dermal component of STSG as well as the subjacent dermal template in all three groups (Figure 2 and 3). Both DS and INT generated significantly thicker dermal tissue when compared to STSG-only, both 7 days (DS 2108 ± 288 µm, INT 1845 ± 243 µm, STSG-only 866 ± 250 µm, $p < 0.0034$) and 21 days after STSG (DS 2857 ± 608 µm, INT 2106 ± 445 µm, STSG-only 1159 ± 408 µm, $p < 0.0053$). When compared to market leading INT, DermiSphere™ induced a similar moderate and transient inflammatory response that produced similar neodermal tissue maturity, thickness, and vascularity, despite being implanted in a single surgical procedure leading to wound closure 2 weeks earlier.

Conclusions: The innovative collagen scaffold microarchitecture of DermiSphereTM developed by FesariusTherapeutics shows significantly increased cellular invasion and neovascularization compared to the market leader. Such expedited angiogenesis and anastomosis with the host vasculature shows great potential for rapid neodermis formation, successful graft incorporation and definitive closure of challenging skin and soft tissue injuries. By harnessing micro-architectural properties and hastening neovascularization, this biocompatible, biodegradable, acellular tissue engineered scaffold holds tremendous promise as a next-generation dermal replacement product.

Speaker

Jason Spector
Chief, Division of Plastic & Reconstructive Surgery
Weill Cornell Medicine

10:30 AM

The treatment of complex acute and "chronic" burn wounds: Exploring the role of acellular fish skin grafts in wound healing (based on pre-clinical studies and on clinical healing outcomes)

10:30 AM - 10:45 AM, Jan 29
Pikake I & II

Skin Substit…

Acute and Chronic, non-healing wounds have a significant economic impact on healthcare and are associated with elevated patient morbidity. Among the toolset of treatment options available to clinicians, skin grafts from other species (xenografts) are often used to promote wound healing. While porcine xenografts have been the most used skin xenograft over the years, acellular fish skin grafts from Atlantic cod have steadily gained traction in usage. Unlike other skin grafts, acellular fish skin grafts have a substantial lipid profile primarily composed of omega-3 fatty acids. The use of acellular fish skin grafts result in faster rates of wound epithelialization, and omega 3 fatty acids provide barrier protection against bacteria and alter the inflammatory profile of wounds. Acellular fish skin grafts have shown to have modulatory effects on the progression of wound healing and the omega-3 fatty acids and their metabolites alter skin physiology at a cellular and molecular level.

Clinically, fish skin grafts continually demonstrate increased efficacy in treatment of wounds. When applied to non-responsive acute and „chronic" burn wounds acellular fish skin grafts have resulted in accelerated healing rates and significantly more fully healed wounds when compared to standard options.

Speaker

Anna-Lisa Pignet
Medical University Graz

10:45 AM

The Role of Nanocrystalline Silver Dressing for Antibiotic Stewardship within Burn Centers

10:45 AM - 11:00 AM, Jan 29
Pikake I & II

Speaker

Paul Glat
Chief of Plastic Surgery, Director of the Burn Unit, Professor of Surgery
St. Christopher's Hospital for Children, Drexel University College of Medicine

11:00 AM

Early Split-Thickness Autografting Over a Collagen-Elastin Dermal Matrix Aids in Vascularization and Decreased Contraction in a Porcine Model

11:00 AM - 11:15 AM, Jan 29
Pikake I & II

Skin Substit…

Introduction

The dermis plays an important role in skin biomechanics and epidermal homeostasis. Following deep cutaneous injuries, restoration of the dermis is key for optimal functional and aesthetic outcomes. To regenerate a healthy, vascularized dermis, several dermal substitutes have been designed. The timing of split-thickness skin graft (STSG) application over these dermal substitutes is critical to success yet has not been studied systematically for some matrices.

Methods

To understand the impact of STSG application timing, a collagen-elastin matrix (CEM) was applied to 2 x 1 in full-thickness acute surgical wounds created on the dorsum of red Duroc pigs following an IACUC approved protocol (10 sites per pig, 5 pigs). CEMs were applied to the sites after which sites were grafted with meshed (1:1.5) and expanded STSG immediately, D0, or 4, 8 or 14 days following CEM application. Sites without a CEM beneath the STSG served as controls. Non-invasive measurements of tissue perfusion, epidermal barrier function, contraction, erythema, pigmentation and biomechanics were collected at each site along with normal pig skin (NPS). All quantitative data were analyzed using a One-Way ANOVA with a Tukey posthoc test.

Results

Engraftment rates were high when CEM were grafted on D8 or earlier (> 97% engraftment); however, engraftment was more variable when CEM were grafted on D14 (avg 75% engraftment, range 100%-5%). Four days post CEM application, all groups were ~4-fold more perfused than normal pig skin. Following grafting, perfusion reduced to 2-fold NPS within one week of grafting. Perfusion within the CEM remained high (4.5-5.2-fold NPS) until STSG application with the D14 group remaining at elevated perfusion levels through 6 weeks post-injury. The presence of the CEM did not hinder re-establishment of epidermal barrier function with all groups reaching baseline values of transepidermal water loss within 4 weeks with no significant difference in rate of re-epithelialization compared to STSG alone. Graft area was inversely related to time of grafting with CEM sites grafted on D0 having 95% of the original area at week 6 and the group grafted on D14 having 73% of the original area at week 6. No differences in graft erythema or pigmentation were measured as a function of presence of CEM or time of graft application. Additionally, no differences in tissue laxity or stiffness, as measured by BTC, were observed.

Conclusions

In a porcine model, immediate and early application (< 14 days) of STSG over a CEM was well tolerated and did not significantly impact engraftment rates or re-epithelialization. Early (≤4 days) application of STSG was correlated with less contraction.

Applicability of Research to Practice

Data suggest immediate and early application of STSG over CEMs is well tolerated.

External Funding

This project was supported by a grant from Access Pro Medical.

Speaker

Heather Powell
Professor
Ohio State University

11:15 AM

Aseptically Processed Dehydrated Allograft Placental Membrane for Limb Salvage Reconstruction

11:15 AM - 11:30 AM, Jan 29

Pikake I & II

Skin Substit…

Introduction

Surgical reconstruction as a “last resort attempt at limb salvage” is challenging and comes with a significant burden of limb loss if failure occurs. Previously, we have reported the use of placental allografts for incisional management following surgical closure of chronic wounds.

Placental allografts provide native matrix proteins and support wound progression. While incisional management following closure of chronic wounds may benefit from the addition of aseptically processed dehydrated allograft placental mini membrane to assist in optimizing the tissue for surgical healing, the value of the supportive tissue is beneficial when failure can result in limb loss.

Methods/Results

We present 5 cases utilizing placental allograft mini membrane to optimize outcomes following reconstruction in the setting of potential limb loss of the lower extremity. The cases include hardware infection in the knee (n=2) and ankle (n=1) and chronic infection without hardware in the knee (n=1) and ankle (n=1). The dehydrated placental mini membrane was placed prior to incision closure and/or over a skin graft. Negative pressure was applied postoperatively and continued for 7-10 days.

Primary healing was achieved in all cases without postoperative infection and/or additional surgical intervention. In 1 case, the patient had a small area of dehiscence which was managed non-operatively and healed without further surgical intervention.

Discussion

The addition of dehydrated allograft placental mini membrane without terminal sterilization to surgical reconstruction may improve surgical outcomes in patients at risk for potential limb loss. The aseptically processed placental tissue without terminal sterilization is known to maintain native matrix proteins and growth factors, which support wound closure and secondary healing. We found that surgical outcomes were encouraging in the face of chronic infection with and without hardware present in the lower extremity at risk for amputation. Additionally, in those cases that had incomplete surgical healing, the wounds healed and/or progressed without recurrent infection.

References

1. DiDomenico LA, Orgill DP, Galiano RD, et al. Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing in chronic diabetic foot ulcers: A prospective, randomized, multi-centre clinical trial in 80 patients. Int Wound J 2018; 15: 950-957.
2. Zelen CM, Orgill DP, Serena TE, et al. An aseptically processed, acellular, reticular, allogenic human dermis improves healing in diabetic foot ulcers: A prospective, randomized, controlled, multicenter follow-up trial. Int Wound J 2018: 1-9.

Speaker

Michael N. Desvigne
Plastic Surgeon
Abrazo Arrowhead Hospital

11:30 AM

Chronic Inhibitory Bacterial Load in Burns and Chronic Wounds

11:30 AM - 11:45 AM, Jan 29

Pikake I & II

Infection

Speaker

Thomas Serena
CEO and Medical Director
SerenaGroup

11:45 AM

Standardizing Burn Wound Care to Improve Knowledge and Workflow

11:45 AM - 11:51 AM, Jan 29

Pikake I & II

Msc./Economy/Basic S…

Background:

Our burn center admits over 400 burn patient per year and see an additional 4-10 patients per week treated in the emergency room, observed, and sent home. To care for a variety of burns we have a repertoire of topical ointments and solutions. In the postoperative period, there can be an array of skin substitutes, donor sites, and autograft techniques that require specific dressing. Our patients require skilled and knowledgeable wound care to be provided by our burn unit nursing staff and providers. The autonomy that is offered to our patients by providers has caused wound care treatments to be confusing and unpredictable to both providers and burn unit nursing staff. The clinical consequences of this are delays in wound care, prolonged procedural time for wound care, and diminished patient and nurse satisfaction. We hypothesized that standardization of wound care after skin grafts, biosynthetic grafts, xenografts, and donor site care could reduce patient and nurse dissatisfaction by making wound care more predictable.

Methods: Collaborating with Burn team providers, RNs, and individual product representatives we created short PowerPoint documents on each of the products with background, typical dressing techniques used, and stages of the healing process. We then translated that into a burn wound care grid that protocolized the care being provided for each graft type and product used and separated it out by postoperative day. Much consideration in this collaboration was taken towards the location's environmental factors, staff availability, the patient population demographics, comorbidities, and environmental or location-based challenges.

The burn care grid was created and then disseminated in poster form in the wound treatment room of the hospital's Burn Unit, as well as the ICU unit. It was also made electronically available to all rotating resident staff and faculty. A brief survey consisting of six questions and one free text comment box was distributed to all Burn floor staff to evaluate the initial usability, helpfulness, and satisfaction.

Results: Survey data found that 77% of staff responded. 78% of respondents found the wound care grid to be helpful. 80% of respondents found it easy to reference. 87% found it easily accessible, while 71% were likely to reference the grid if they had a question. 69% found it to improve their knowledge of the products, while 81% found it helpful in providing patient care. Many of the respondents said they would like tactile and visual pictures of the products available. Other comments asked for an easier way to explain the products to the patients and a reference to explain to the patients why they received one treatment method versus others.

Conclusion: Based on the nursing survey, the burn wound care grid reference had a positive response in helping workflow, accessibility, and knowledge of hospital courses and products used. The grid also was helpful with the clinical flow of wound care. We learned that the grid did not achieve the goals of improving the knowledge of the surgical procedure, identification of dressing types, and rationale of selected treatments. Based on feedback from the survey the next step will be to create a more tactile and interactive reference to facilitate staff and patients' understanding of burn procedures, wound products, and wound treatment rationale of post-operative care.

Speaker

Michael Young
Burn Surgery Advance Practice Provider / First Assistant
The Ohio State University Wexner Medical Center

11:51 AM

Synthetic Biodegradable Guided Wound Matrix: An option in wound closure in deep and non-healing burn wounds

11:51 AM - 11:57 AM, Jan 29
Pikake I & II
Skin Substit…

Introduction

We describe the use of synthetic biodegradable guided wound matrix (Supra-SDRM) in two complex burn patients admitted to an urban burn center in the US. In both cases patients had deep and slow or non-healing burn wounds. Synthetic biodegradable guided wound matrix is used in each case as novel therapy for treating these wounds in both an OR and bedside setting.

Materials and Methods

The information from the electronic medical records (EPIC) was searched and data collected. An IRB approved study previously obtained grants the ability to access data on healing of burn wounds.

Results

In Case 1 there was 97% healing in scalp wound at 5 months, with placement of synthetic biodegradable guided wound matrix at 3.5 months. Three applications were required for healing and all applications were done at the bedside.

In Case 2 approximately 65% healing of wounds was achieved at time of death in Hospice care. Three applications of synthetic biodegradable guided wound matrix were performed, one at bedside and two in the operating room. Patient was able to be discharged home in between applications, increasing his quality of life.

Discussion

These two cases demonstrate the use of synthetic biodegradable guided wound matrix in deep and slow or non-healing burn wounds. This type of wound closure has the advantages of ease of application and minimal pain to the patient. It is ideal for bedside application to deep burns, traumatic or other types of wounds, and can be applied at bedside by advanced practice providers. Synthetic biodegradable guided wound matrix should be considered as an optimal choice for dermal substitutes for deep burn wounds.

Speaker

Patricia Gebe
Advanced Practice Provider
University of North Carolina at Chapel Hill

11:57 AM

Treatment Patterns and Outcomes of Medicare Enrollees who Developed Venous Leg Ulcers

11:57 AM - 12:12 PM, Jan 29
Pikake I & II
Msc./Economy/Basic S…

Aim: To retrospectively evaluate the comorbidities, treatment patterns and outcomes of Medicare enrollees who developed venous leg ulcers (VLUs).

Methods: Medicare Limited Data Standard Analytic Hospital Inpatient and Outpatient Department Files were used to follow patient episodes who received medical care for a VLU from October 1, 2015 through October 2, 2019. Patients diagnosed with chronic venous insufficiency and a VLU were propensity matched into four groups based on their treatment regimen. Episode claims were used to document demographics, comorbidities, and treatments of Medicare enrollees who develop VLUs and important outcomes such as time to ulcer closure, rates of complications, and hospital utilization rates. Outcomes were compared across key propensity matched groups.

Results/Discussion: Forty-two percent of Medicare enrollees with chronic venous insufficiency (1,225,278), developed at least one VLU during the study, and 79% had their episode claim complete within one year. However, 59% of patients developed another VLU during the study period. This analysis shows that only 38.4% of VLU episodes received documented VLU conservative care treatment. Propensity matched episodes which received an advanced treatment or high-cost cellular, acellular, matrix-like products (CAMPS) for a wound which had not progressed by 30 days saw the best outcomes when their treatment was applied weekly or biweekly (following parameters for use).

Conclusions: Medicare enrollees with chronic venous insufficiency have diverse comorbidities and many of these patients do not receive sufficient management which contributes to high rates of VLUs and subsequent complications. Medicare patients at risk for a VLU who receive early identification and advanced treatment demonstrated improved quality of life and significantly reduced healthcare resource utilization.

Speaker

William Tettelbach
Chief Medical Officer, Adjunct Assistant Professor
RestorixHealth, Duke University School of Medicine

12:12 PM

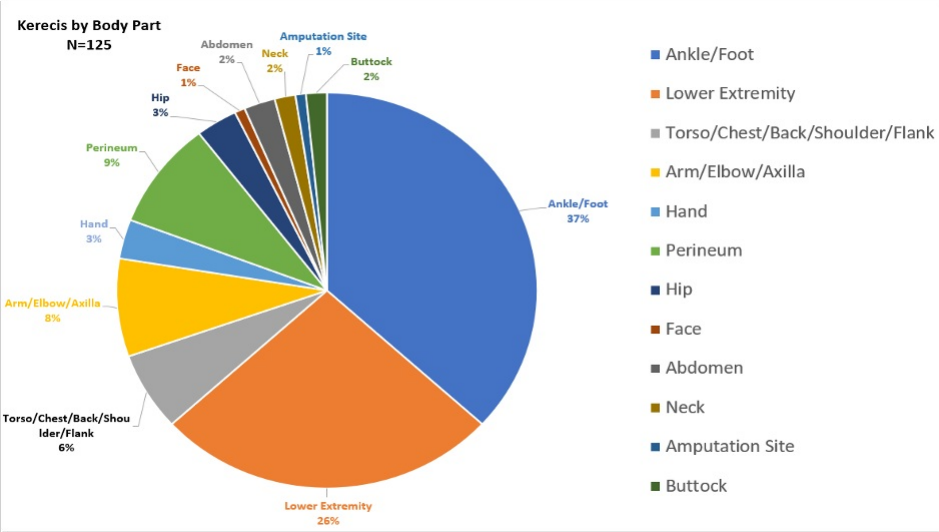
Kerecis for acute burns and burn reconstruction

12:12 PM - 12:18 PM, Jan 29
Pikake I & II
Skin Substit…

Intact fish skin (Kerecis) is a newer tissue regeneration product derived from Icelandic cod. It is described as an excellent scaffold which enhances cell proliferation, neovascularization and decreases inflammation in the wound bed. Therefore, it is adjunctive on a cellular basis in all phases of wound healing.

We have used Intact fish skin as a platform for the management of the wound bed for both acute and reconstructive wounds in 125 patients from January- December 2022 (Fig 1). The majority have been to the lower extremity/ ankle and foot (63%) followed by the perineum (9%), Upper extremity (8%) and the torso (6%). Indications for use include exposed neuro-vascular structures, partially colonized wound beds, poorly granulating wounds, reconstructed wound beds with the need for leveling the wound bed.

The advantages of this scaffold are that it is able to tolerate colonization, its use produces a fairly elastic wound base ("neo-dermis")



and allows wound closure in difficult wounds. The newly developed base can be built upon with successive applications to build contour in wounds that have a significant contour deformity or are in need of a more planar wound bed for skin grafting. In addition, keratinocytes (either STSG or Recell) adhere well to the construct.

Speaker

Rajiv Sood
Chief of Plastic Surgery and Burn Reconstruction
JMS burn center

12:18 PM

A Case Report of the Surgical Treatment of Severe Hidradenitis Suppurativa using NovoSorb Biodegradable Temporizing Matrix (BTM) and NovoSorb MTX Dermal Matrices

12:18 PM - 12:24 PM, Jan 29
Pikake I & II
Skin Substit...

Hidradenitis suppurativa (HS) is a chronic inflammatory skin disease that affects the apocrine-rich areas of the body and is characterized by painful abscesses, wounds with foul odor, sinus tracts, and fibrosis. It's true prevalence is unknown, but its negative affect on patients' quality of life, especially in severely extensive disease is well prevalent. Surgery can be curative but the management of severe disease using radical excision and subsequent skin grafting can be hampered by prolonged postop pain, burdensome wound care, and protracted duration of treatment. However, the use of NovoSorb Biodegradable Temporizing Matrix (BTM) and MTX dermal matrices can help address these shortcomings and help achieve good outcomes.

This case is of a 42-year-old male with 20+ years of Hidradenitis disease that first began around the time of his high school graduation. It started at the posterior neck, and subsequently affected the axillas, chest, groins, buttocks, and thighs. His medical history is also notable for Ankylosis Spondylitis, which manifested after the HS symptoms. The patient's medical treatments included years of oral corticosteroid therapy, use of various biologics, and oral and topical antibiotic therapies. His surgical histories included multiple deroofing surgeries, and wide excisions with primary closures of various affected sites, with associated severe pain with postop wound care and recurrence of disease. Among the affected sites, the chest was the largest in area, and was Hurley stage 3 disease. Surgical recommendations were made for a staged treatment approach. The first stage would consist of radical excision of clinically active disease and application of NovoSorb BTM to establish a well vascularized wound bed. The second stage would then consist of split thickness skin grafting. The patient underwent two operations for radical excision of disease. At the first excision surgery the depth of disease was seen extending to the subfascial level of pectoralis major in the central 1/3rd of the chest, and there were also multiple large pockets of pus present. He was admitted postop with plans for a second debridement operation to ensure a clean wound bed. IV antibiotic therapy was also initiated. Four days later, he was taken back for the "second look" radical excision surgery. BTM was applied along with BTM's complementary product, Novosorb MTX. MTX was applied at the central 1/3rd of the wound to help augment the concavity present at the central portion of the wound. The patient was discharged home on postop day 3, without any complicated wound care required. Split thickness skin grafting was performed 38 days later, and he was discharged after a 23-hr observation period for pain control due to the large areas of grafting. His post skin grafting course was uncomplicated and at the postop day 42 follow up visit, there is 100% skin graft take, and there is no signs of recurrent disease.

This case demonstrates the successful surgical treatment of a large anterior chest Hurley stage 3 HS disease using a two-stage approach with application of NovoSorb BTM and MTX dermal matrices as adjuncts. This approach avoided cumbersome postop wound care for patients and potential severe postop pain associated with dressing changes and did not require any prolonged hospitalization for treatment. Morbidity for the patient was minimize while the skin grafting outcome was maximized. This straightforward treatment approach using NovoSorb dermal matrices can potentially be applied to Hurley stage 2 or 3 disease affecting any parts of the body in Hidradenitis patients, offering curative surgery for large disease areas.

Speaker

Phu Tran
Plastic Surgeon
UCSF Fresno

12:30 PM

Lunch Symposium: Aroa Biosurgery: Na'auao: Understanding How Ovine Forestomach Matrix Fits in My Burn Practice

12:30 PM - 1:30 PM, Jan 29
Puakenikeni Room
General Meet...

Join us for an exclusive luncheon sponsored by AROA Biosurgery, featuring Dr. Nicole Bernal from Ohio State University, a leading expert in Surgical Critical Care and Trauma Surgery. Dr. Bernal will present her groundbreaking clinical outcomes on deep partial thickness burns utilizing an ovine forestomach matrix known as Myriad Matrix. This engaging session will cover the application of a responsibly priced extracellular matrix technology in burn care, showcasing Dr. Bernal's surgical approach, post-operative care strategies, and notable findings. Don't miss this unique opportunity to gain insights into innovative surgical methodologies and impactful clinical results.

Speaker

Nicole Bernal
The Ohio State University Wexner Medical Center

5:00 PM

Wine and Cheese Poster Reception

5:00 PM

5:00 PM - 6:00 PM, Jan 29

Aulani Foyer

General Meet…

Change of practice study evaluating a case series of donor site management with autologous skin cell suspension and biologic (Kerecis) or synthetic (Suprathel) skin substitute

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

PURPOSE: The optimal management of donor sites from split thickness skin grafts remains under investigation. The utilization of both biologic and synthetic skin substitutes to promote donor site healing is part of the standard of care. Current practice is to use some type of graft to reduce pain and simplify wound care, compared to outdated methods such as allowing donor sites to dry out or daily dressing changes. This case series compares the management of donor sites with xenograft (Kerecis) application to synthetic skin substitute (Suprathel) application.

METHODS: This is a change of practice study, starting with synthetic skin substitute and changing to xenograft, in response to a cluster of donor site complications. Forty-three consecutive patients with donor sites from split thickness skin graft were treated with application of autologous skin cell suspension sprayed directly on the wound bed and then a biologic (Kerecis) or synthetic (Suprathel) skin substitute, at a Level 1 trauma center. Donor sites were evaluated for complications including bleeding, delayed healing, and hypertrophic scar formation. Chi square analysis was performed on the data to evaluate statistical significance.

RESULTS: The percent of patients with donor site complications after the application of Suprathel was 5 of 15 patients (33%) compared to 1 of 28 patients (4%) after the application of Kerecis. In addition to the clinical significance of these findings, the statistical significance was confirmed by Chi-Square analysis with a p value of 0.007.

CONCLUSION: When used for donor site management the application of Kerecis significantly reduces donor site complication rate when compared to the application of Suprathel. including reduction of donor site morbidity, and low incidence of hypertrophic scarring.

Speaker

Carrie McGroarty
Plastic and Reconstructive Surgery Physician Assistant
WakeMed Health and Hospitals

Atypical Presentation of Frostbite Resulting in Loss of Skin from Buttock and Bilateral Lower Extremities Without Deep Tissue Injury

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction

Frostbite is a cold related injury that occurs when the skin and tissue are exposed to temperatures below zero degrees Celsius (°C) for a sustained period of time [1,2]. The typical presentations are tissue damage of the distal extremities and ischemic changes to digits, hands, feet, and nose depending on the external temperature that the body is exposed to and length of exposure. We present an atypical presentation of frostbite that resulted only in necrosis of skin of the bilateral lower extremities and lower abdomen in the setting of prolonged cold exposure. This is our experience of a multidisciplinary and multimodal approach to coverage of a 42% TBSA wound with exposed bone, tendon, and muscle in the setting of limited donor sites.

Case presentation

A 22-year-old female with no significant past medical history presented with severe hypothermic shock (core temperature of 75 degrees Fahrenheit) and 42% total body surface area skin necrosis circumferential on bilateral lower extremities that extended from feet to hips and buttocks (Figure 1). She was found down in a snowbank and unresponsive in a t-shirt and shorts during a winter storm after jumping out a moving vehicle, and sustained exposure for six hours. After initial rewarming for hypothermia and treatment with TPA she was transferred to our institution. After 6 days, all her skin from waist down necrosed sparing only the feet. The tip of her left great toe and the fingers of the left hand had a typical necrosis. After excision to healthy tissue, she was left with exposed bilateral patella and tendon, lower extremity muscles and tendons, and bone in bilateral ankles.

Methods

She had 13 operative days (16 distinct operations) to get the wounds closed. She only required an amputation of left-hand phalanxes. Omental flaps were taken at time of laparoscopic diverting colostomy were utilized to cover the bone and tendon of the ankles. The colostomy was completed after recurrent gram-negative infections of wounds on buttock and thigh from stool contamination. Polymer foam dermal substitute was used to optimize the wound bed for grafting from the knees down and several layers were used to cover the patella. Cadaveric skin was used to temporize wounds on the thighs and buttocks that had recurrent infections prior to grafting. The patient refused use of any donor site other than her back and abdomen. The autografting was completed with mesh ratio of 4:1 and 6:1 with Autologous Skin Cell Suspension (ASCS). The only exception were the knees and ankle which were covered with 1:1 or 2:1 meshed graft.

Results

Due patient restrictions on donor sites, challenges with patient participation with therapy and wound care, she required a 5-month inpatient stay. ICU/step down length of stay was 107 days and she had 43 days at acute care status. She was discharged to a skilled nursing facility with non-healing buttock wounds and not able to sit or walk. She was at the facility for an additional 2 months until she could walk and then went to inpatient rehab for 3 weeks prior to discharge home. Her only remaining wound involves the patella which will require flap coverage. Coverage of the wounds with limited donor sites was accomplished with wide mesh graft and ASCS.

Conclusion:

Given the extreme cold, extent of exposure and lack of protective clothing, one would have expected more extensive amputation of distal extremities. Since her feet had viable skin, muscle, and toe amputation was not required, the team put a plan into place to save the legs.

The choice of employment of the omental flap was due to its neovascularization, tissue healing, and tissue regenerative properties [3], the application of this type of flap to the lower extremities to cover exposed tendon has only been reported one other time. We were able to create a wound bed over the exposed bone and tendon on the knees and lower legs and over the omental flap with Polymer foam dermal substitute successfully in a colonized wound bed. We were able to respect the patients need for autonomy and utilize ASCS to cover the area with limited donor sites. This case proved to be a challenging and unique presentation of frostbite; limb salvage was possible through a multimodal approach for wound coverage.

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Speaker

Chinaemelum Akpunonu
Post Graduate Year 2 of General Surgery Residency
The Ohio State University at Wexner Medical Center

Management of Surgical Site Wound Breakdown with a Surfactant-Based Gel Dressing: A Case Report

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction

Advancements in wound care have significantly improved our ability to improve healing of complex wounds. Topical therapies rely on prevention of infection and creation of an environment to promote healing. Chronic wounds are frozen in a state of prolonged inflammation with an increased amount of under-perfused and devitalized tissue, exudative debris and microbial overgrowth, all impairing the potential to heal. In an effort to combat these wound bed issues and optimize healing, surfactant-based gel dressings have been developed to loosen and trap debris, providing local debridement at the wound base while hydrating healthy surrounding tissue, promoting growth.

Case Description

A 59-year-old otherwise healthy female who previously underwent an open reduction and internal fixation of a left trimalleolar fracture following a mechanical fall from standing presented with cellulitis and dehiscence of her surgical incision. She initially presented 4 weeks following surgery with small breakdowns of the proximal and distal ends of her incision with overlying cellulitis. She was treated with oral antibiotics and approximation of wound edges. At 8 weeks following surgery, the patient had more wound breakdown with larger proximal and distal wounds, with surrounding edema and erythema requiring local therapy with wet to dry dressing changes. The patient had continued progression of wound breakdown with escalating local wound therapies to include collagen matrix and antimicrobial dressings. Despite escalation of care, patient continued to have progression of her wound. The patient was ultimately transitioned to the surfactant-based gel dressing (Plurogel®) 12 weeks following initial surgery and 8 weeks after initial dehiscence. The wound had improved erythema and edema at 1 week after application with no nonviable tissue and granulation tissue beginning to form. At 8 weeks, the proximal wound showed a 64.3% reduction in wound size and the distal wound showed 96.5% reduction in wound size.

Conclusion

Surfactant-based gel dressings (Plurogel®) are an additional topical dressing to combat chronic wounds, promoting wound healing with noticeable improvement of the wound beds with eventual reduction in the size of wound.

DOD Disclaimer

The views expressed herein are those of the author(s) and do not necessarily reflect the official policy or position of the Defense Health Agency, Brooke Army Medical Center, the Department of Defense, nor any agencies under the U.S. Government.

Speaker

Connor Kenney
Surgery Resident
Brooke Army Medical Center

Shim-Trunk Burn Reconstruction

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction: Autologous skin grafting has been the popular method for reconstructing post-burn defects. However, this technique has limitations such as high contracture rates, inadequate volume coverage, and limited availability of donor sites. This report aims to describe the principles and advantages of utilizing microsurgically linked perforator flaps for the reconstruction of extensive burn defects and associated post-burn scar contracture in the lower and upper extremities and trunk.

Method: A total of 20 patients who underwent free tissue transfer for primary and secondary burn wound reconstruction at a single institution between 2016 and 2023 were included in the study. All patients received sequentially linked flaps for the correction of post-burn deformities. Postoperative results were evaluated, including flap survival, complications, and the DASH self-report questionnaire for upper extremity reconstruction.

Result: Among the 20 patients, 12 required primary reconstruction, while 8 underwent secondary reconstruction using anastomotic chimeric free tissue transfer. The majority of burn injuries resulted from thermal contact(40%, n=8), followed by flames(25%, n=5), scalds(20%, n=4), electrical contact(10%, n=2), and friction(5%, n=1). The most frequently utilized combinations were the thoracodorsal artery perforator(TDAp) and anterolateral thigh(ALT) flap(11 cases, 55%). Additionally, four cases involved the pedicled TDAp flap in conjunction with the deep inferior epigastric artery perforator(DIEP) flap. The average DASH score for upper extremity burn patients was 10.58.

Conclusion: Three-dimensional tissue coverage achieved through the sequential linkage of two or even three independent free flaps is increasingly utilized in post-burn reconstruction. This approach offers multiple advantages and represents a viable option for burn reconstruction.

Speaker

Hyung-Sup Shim
Professor
The Catholic University of Korea

Multiple digit resurfacing with a lateral thoracic free flap of Hand Burns: Two-stage mitten hand and division procedures

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction: : The conventional abdominal and groin flaps for resurfacing the defect have several disadvantages, including the risk of flap failure due to accidental traction or detachment, immobilization of the arm before division, and aesthetic dissatisfaction because of the flap bulkiness. The aim of this study was to share our experiences with the free lateral thoracic flap and elucidate the optimal timing of division in complex hand reconstruction, which yielded favorable outcomes in terms of both functionality

Method: This article is a retrospective review of multiple digit resurfacing using free tissue transfer from 2012 to 2022. Patients who underwent two-stage operation including mitten hand creation using superthin thoracodorsal artery perforator (TDAp) free flap and secondary division were included. A flap was elevated over the superficial fascia layer the midportion between the anterior border of the latissimus dorsi and pectoralis major muscles and once the pedicle was found, an outline that matched the defect was created. A process named “pushing with pressure and cutting” was carried out before pedicle ligation until all the superficial fat tissue had been removed except for around the perforator. Two cases (18%) involved defects of the entire fingers reconstructed by TDAp flap with anterolateral thigh flap. Six cases (55%) had a super-thin TDAp flap only. In two cases (18%), non-vascularized iliac bone grafting was required for finger lengthening. One case (9%) was resurfaced with a TDAp chimeric flap including a skin paddle with the serratus anterior muscle. The primary outcome was defined as the survival or failure of the flap, while the secondary outcomes associated complications such as infection and partial flap necrosis. A statistical analysis was not performed due to the size of the case series..

Result: All 13 flaps survived completely without any complications. Flap dimension ranged from 12 cm x 7 cm to 30 cm x 15 cm. Mitten hand duration prior to division was 41.9 days on average which was essential for the optimal result. During the division procedures, there were nine cases of debulking (82%), six cases of split-thickness skin graft (STSG) (55%), and three cases of Z-plasty performed on the first web space (27%). The mean follow-up period was 20.2 months. Mean Disability of the Arm, Shoulder, and Hand (DASH) Questionnaire score was 10.76.

Conclusion: We resurfaced severe soft tissue defects of multiple fingers with thin to super-thin free flaps, mainly TDAp flaps. Surgeons can restore original hand shape using a two-stage reconstructive strategy of mitten hand creation and proper division timing to create a 3-dimensional hand structure, even in severely injured hands with multiple soft tissue defects of the digits.

Speaker

Hyung-Sup Shim
Professor
The Catholic University of Korea

Free flap coverage for skin and soft tissue defect on dorsal foot due to third degree burn

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction

Complicated injuries to the lower extremities expose vital structures such as blood vessels, tendons, and bones, leading to defects. If the damaged area is not adequately covered with connective tissue, functional loss may occur, necessitating surgical interventions like amputation. This negatively impacts the patient's quality of life, emphasizing the need for appropriate reconstruction.

Microsurgical procedures, such as free flap surgery, may be considered as a primary option for lower extremity reconstruction. In the past, reconstructing the lower extremities was challenging due to the complex skin and soft tissue structures, and the limited availability of donor sites for local flaps. However, advancements in microsurgery have improved the efficacy of free flap surgery, enabling it to provide satisfactory functional and aesthetic outcomes in lower extremity reconstruction.

This report presents a case in which free flap surgery was employed as the primary treatment for a patient with a third-degree burn on the dorsum and ankle of the foot, resulting in a loss of connective tissue.

Case

A 62-year-old male presented with a burn injury, accompanied by cellulitis and abscess in the right foot. The patient had sustained a third-degree burn on the dorsum and ankle of the right foot from welding sparks two weeks prior, and despite initial management with antibiotics and wound care at another hospital, the condition worsened. (Fig. 1) An MRI of the foot revealed widespread cellulitis and abscess extending from the proximal metatarsal area to the lateral aspect of the ankle. (Fig. 2)

Serial debridement and wound irrigation were performed repeatedly over a 10-day period, resulting in the control of infection and elimination of the abscess. (Fig. 3) This improvement was also confirmed by CT imaging. (Fig. 4) Subsequently, reconstruction of the foot using free flap surgery was planned.

After serial debridement of the eschar, a 12 x 6 cm sized defect was remained, exposing tendons and the dorsalis pedis artery. (Fig. 5A) A free flap was harvested from the anterolateral thigh, including the lateral circumflex femoral artery, and the dorsalis pedis artery and surrounding veins were selected as recipient vessels for microvascular anastomosis. (Fig. 5B, 5C) The free flap has been maintained without complications, ensuring overall survival.

Conclusion

The reconstruction of the defect in the lower leg was a challenging issue due to the limited options of locally available grafts. After debridement surgery, many functionally important structures were exposed, making it essential to adequately cover the defect with surrounding tissues. The free flap can be the first choice in treatment, as in this case, yielding favorable outcomes both functionally and aesthetically

Figures

Figure 1. A third-degree burn caused by flames, the affected area presents erythema, swelling, and warmth, extending from the metatarsal dorsum to the midfoot region.

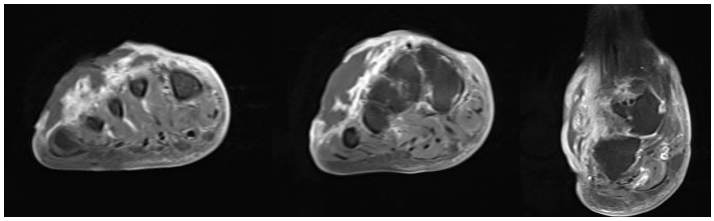

Figure 2. The MRI conducted at initial visit, revealed widespread soft tissue inflammation and the formation of an abscess extending from the proximal part of the metatarsal to the lateral side of the ankle.

Figure 3. Following multiple debridement and irrigation procedures, the signs of infection have been controlled, and the abscess has been successfully removed.

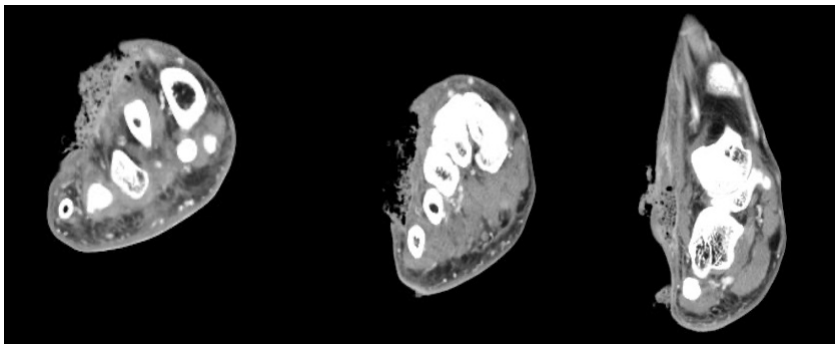

Figure 4. The resolution of the previous soft tissue inflammation and abscess is observed on the CT scan.

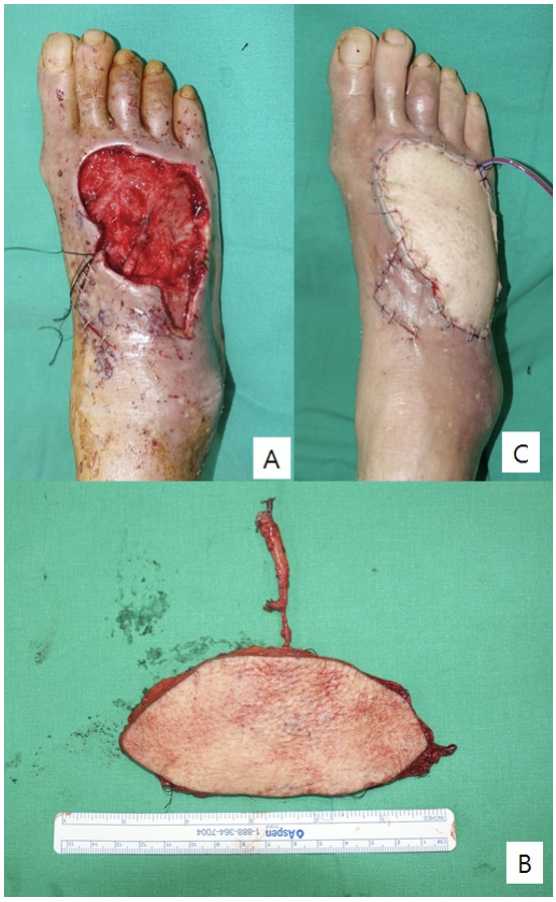

Figure 5.

A. The wound site, following multiple debridement procedures, revealed a 12 x 6 cm sized defect, exposing tendons and the dorsalis pedis artery.

B. A 13 x 8 cm sized anterolateral thigh(ALT) flap was harvested.

C. A post-operative clinical photo, using the dorsalis pedis artery and veins as recipient vessels for the free flap.

Speaker

Jaewon Kim

Surgical treatment and strategy in patients with pressure sores Choosing the optimal flap for reconstruction

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction: Pressure sores are a common concern for individuals with limited mobility and require a comprehensive approach for effective management. This report provides a concise overview of the clinical approach employed at the 'Comprehensive Clinic for Pressure Injuries' at SNUBH. In the initial stage of treatment, a crucial step is to establish clear treatment goals, achieved through in-depth discussions with patients. In addition, we discusses the advantages of utilizing perforator-based island flaps (PBIF) to prevent recurrence.

Method: We conducted a clinical study to assess the effectiveness of PBIFs in preventing recurrence of pressure sores. Patients with pressure sores requiring surgical reconstruction were selected for this study. The key advantage of PBIF, in this case, was the emphasis on addressing color difference and flap thickness. Surgical procedures were performed by experienced surgeons, utilizing PBIF techniques tailored to each patient's specific needs.

Results: The application of PBIFs demonstrated a lower recurrence rate compared to conventional flaps, and this difference was statistically significant. These results indicate that PBIF is an effective method for achieving both functional and aesthetic success in pressure sore reconstruction, ultimately enhancing patient satisfaction and outcomes.

Conclusion: In conclusion, the clinical approach at the 'Comprehensive Clinic for Pressure Injuries' focuses on establishing personalized treatment goals, selective surgical reconstruction. In addition, the application of PBIFs have shown to be effective in reducing the recurrence rate of pressure sores, providing better outcomes for patients with pressure sore.

Speaker

Jong-Ho Kim
Seoul National University Bundang Hospital

The effects of Povidone-iodine hydrogel on the treatment of diabetic foot ulcers

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Background : The diabetic foot is a common and devastating complication that occurs to patients with diabetes mellitus. These are associated with increased mortality, illness and reduced quality of life. Povidone-iodine hydrogel is composed of 3% povidone-iodine and liposomal Hydrogel (Repithel ®: Mundipharma GmbH, German). This dressing aims at removing slough tissue, creating a clean wound bed, improving moisture environment and reducing bioburden.

Objective : This study was intended to investigate the effects of povidone-iodine hydrogel on reducing wound size, preventing local infection and discomfort of diabetic foot ulcers.

Methods: All the wounds were applied with povidone-iodine hydrogel and then covered with a polyurethane foam. The number of times to dressing was performed two to three times a week, depending on the status of ulcers. 15 patients with diabetic foot ulcers were assessed and monitored in the clinic weekly for 24weeks. During each visit to patients, the ulcer size and condition of wound bed were assessed. A 10cm visual analogue scale was used to estimate the degree of patients' discomfort.

Result : The ten patients' wound size was reduced by over 50%. The five patients' wound was healed completely. The degree of discomfort remarkably decreased. However two patients complained about the discomfort continuously. No patient has suffered from local infections.

Conclusion : It was found that povidone-iodine hydrogel is not only easy and convenient dressing method for patients but also safe and effective treatment in promoting the healing of diabetic foot ulcers.

Speaker

Jung Yoon Kim
wound care nurse

Effects of Injection of Polydeoxyribonucleotide(PDRN) on the Management of pressure Injuires

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Problems : A pressure injury, which is a type of chronic wound, reflects damage occurring on skin and tissue through continuous pressure imposed on the tissue. It not only causes pain and make patients susceptible to morbidity and mortality but also result in increased medical spending and prolonged hospital stay. Polydeoxyribonucleotide (PDRN) helps healing in wounds involving skin damage by stimulating tissue reconstruction without any side effects. This study aimed to examine the positive effects of PDRN on the wound-healing process in pressure injuries.

Rationals : As a deoxyribonucleotide linear polymer, PDRN is a combination of purine and phosphodiester bonds forming the monometric unit of pyrimidine nucleotides. It is known to selectively act on the A2 purinergic receptor to help cell growth and neogenesis.

Method : In this randomized controlled trial, the effects of PDRN (Placentex® Integro; Mastelli Srl, Sanremo, Italy) were compared over time between an experimental group (n=11) and a control group (n=12). The former was administered the same dose of PDRN intramuscularly(1 ampule, 3 mL, 5.625 mg, for 5 days) for 2 weeks and perilesionally (1 ampule, 3 mL, 5.625 mg, twice a week) for 4 weeks. The primary endpoint for determining efficacy was size of wound using VISITRAK Digital (Smith & Nephew, Largo, FL). The secondary endpoint was determined using Pressure ulcer scale for healing (PUSH Tool 3.0 developed by the National Pressure Ulcer Advisory Panel).

Results : After the 4-week treatment period, PDRN therapy was found to significantly reduce the wound size and PUSH score, without adverse effect during the treatment.

Conclusions: The findings indicate that PDRN can positively modify the wound healing process in pressure injuriess, and its use could improve the clinical outcomes of patients and lower the need for additional therapies or hospital stay.

Speaker

Jung Yoon Kim
wound care nurse

Efficacy of RECELL® System and Autologous Cultured Epidermis in Combination Time-Differential Therapy in Extensive Burns; A Case Report

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

In extensive burns, effective use of skin donor site is required. Autologous cultured epidermis (CEA) can be expanded to an area approximately 1000 times larger than the area of the skin sampled. However, it takes approximately three weeks from skin harvesting to CEA use. Extensive burns require early excision and skin grafting, and also require efficient and stable wound closure in early treatment period.

The RECELL® system, in combination with meshed split thickness skin grafts (STSG), provides good, stable wound closure in full thickness burns, from an early stage and also allows early epithelialization of donor site. We report a case of an extensive burn in which early wound closure was achieved using the RECELL ® system and meshed STSG, and when autologous cultured epidermis (CEA) became available, the remaining wound was closed using CEA in combination of meshed STSG.

[Case] 63-year-old male. 40%TBSA full thickness flame burns were sustained as a result of a cigarette fire igniting clothing (Fig. 1). On the day of injury, a cervical escharotomy and debridement were performed, followed by a mesh STSG (1.5:1). Both upper limbs were covered with artificial dermis after debridement. Post burn day 3, after debridement of the anterior trunk, the wound was covered using RECELL® and 3:1 STSG using donor skin form the back and posterior thighs. RECELL® was also applied donor site. At 3 weeks post-injury, when CEA was available, the remaining lateral raw surface of the trunk and both upper limbs was covered with a combination of 6:1 STSG and CEA (Fig. 2). Subsequent conservative treatment resulted in closure of the entire burn wound.

This time-delayed combination method of RECELL® and CEA has been very effective.

Fig.1: Day of burn injury

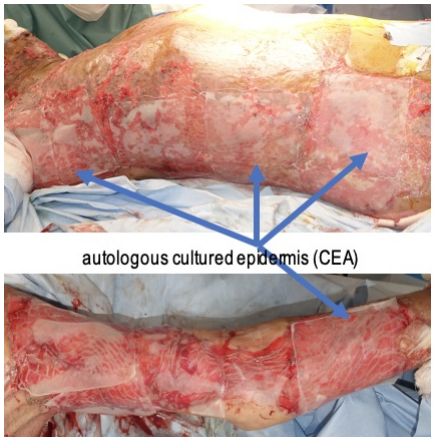

Fig.2: 3 weeks post-injury

Speaker

Junichi Sasaki
Professor
Keio University School of Medicine

Epidermal growth factor receptor signaling on age-associated alteration of keratinocyte -To improve wound healing for elderly burned victims-

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction

Skin regenerative capacity declines with age, but the underlying mechanisms are largely unknown. Here we demonstrate epidermal growth factor receptor (EGFR) signaling on age-associated alteration of keratinocyte in mouse skin wound healing.

Materials and Methods

C57BL/6N mice, 12-week-old (n = 3) and 19–25-mo-old (n = 3) male mice, were used as young and old mice in the experiments, respectively. Before wounding, mice were anesthetized using isoflurane, and the absence of a physical and physiological response to a noxious stimulus was verified. A 6-mm-diameter punch biopsy was performed to make a circular full-thickness wound on the dorsal skin. 3 d after wounding, all mice were euthanized, and the wounded area was excised from the skin. An ～2-mm margin of the wound was collected for Western blotting. Rabbit monoclonal antibody against EGFR and rabbit polyclonal antibody against phospho-EGFR were used for Western blotting.

Results

Strong signals of phospho-EGFR were detected in the protein lysate prepared from the wound in the young mice, but the signals were decreased in the lysates from the aged mice. Western blot analysis confirmed these results and also revealed that the level of phosphorylated EGFR was reduced in protein lysates prepared from aged mice, even though the EGFR expression level was maintained.

Discussion

Wound healing experiments strongly suggested that the decline of EGFR signaling with aging results in an age-associated alteration of keratinocyte migration and reepithelialization. The decreased phosphorylation of EGFR results from the reduced production of EGFR ligands in wounds and/or the dysregulation of EGFR signaling in keratinocytes.

Speaker

Kyoichi Matsuzaki
Professor
Department of Plastic and Reconstructive Surgery , International University of Health and Welfare School of Medicine

A retrospective analysis of the use of VERSAJET™ Hydrosurgery System in the management of burn patients.

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Background: Burn injury result in lifelong psychological and physical scarring, causing considerable morbidity and mortality [1], resulting in 40,000 admissions annually in the US and about 30,000 in specialist burn centres[2]. Burns have a huge economic impact with hospitalized patients costing around $1 billion/year [2] in the US. To promote wound healing, reduce risks of infection, and improve patients' and economic outcomes devitalized tissue should be removed. One such way is debridement, which comes in various forms such as enzymatic, surgical, mechanical. This study aimed to assess the use of Versajet Hydrosurgery System compared to standard of care in the management of burn patients. **Methods:** This retrospective study used deidentified HIPAA compliant data from the Premier PINC AI Healthcare Database (PHD) between 2017 to 2022Q2. The PHD is an all-payer database with information on inpatient discharges representing approximately 25% of annual United States inpatient admissions[3]. Patients with burns were identified using ICD-10 diagnosis and procedure codes. We used propensity matching to ensure we had a balanced cohort in terms of patient (race, age, gender, comorbidities) and hospital (region, size, teaching/rural) characteristics. We measured the following outcomes: infection rates, inpatient readmissions over 30 and 90 days, debridement and scarring at one year. **Results:** We identified and did a one-to-one matching of 1460 patients treated with Versajet and standard of care each. Most patients came from large, urban teaching hospitals. 99.6% of patients treated with Versajet had third degree burns compared to 8% in the standard of care, and age range was 0 to 89 years in both groups. Versajet resulted in significant reduction in 30-day (p=0.026) and 90-day inpatient readmission (0.006), one year scarring outcomes (p=0.028), debridement counts at 30 days (p=0.014) compared to standard of care. No differences were observed in infections (p=0.125). **Conclusions:** This study demonstrated that treating burn patients with Versajet can potentially reduce inpatient readmissions, debridement counts and most important the cosmesis outcome of scarring when compared with standard of care. The study is large and uses real world evidence in matched patients.

References

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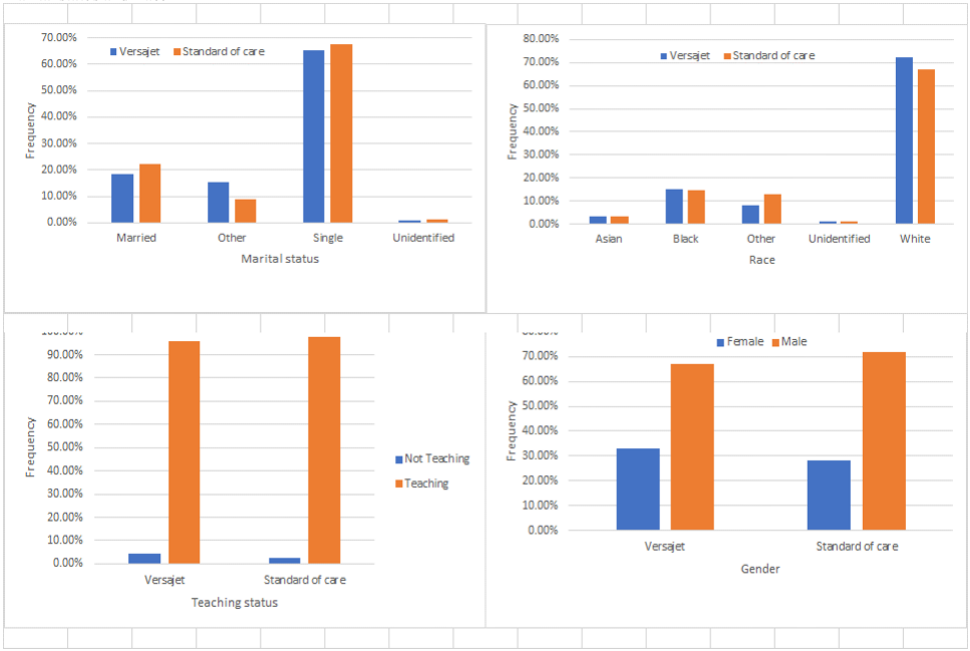
Appendix baseline data

Marital status and Race



Speaker

Leo Nherera
Director Health Economics and Outcomes Research
Smith+Nephew

A Novel Surgical Treatment Adjunct to Pyoderma Gangrenosum with a Wide Mesh and Autologous Aerosolized Skin Grafting. A Case Series.

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

A NOVEL SURGICAL TREATMENT ADJUNCT TO PYODERMA GANGRENOSUM WITH A WIDE MESH AND AUTOLOGOUS AEROSOLIZED SKIN GRAFTING. A CASE SERIES

Lourdes Castañón MD, Beverley Trutter MD, David Contreras, Michael Ditillo DO, Bellal Joseph MD
Division of Trauma, Critical Care, Burns, and Emergency Surgery
The University of Arizona College of Medicine – Tucson, Arizona

BACKGROUND

Pyoderma gangrenosum (PG) is characterized by neutrophil infiltration and inflammation of the skin, marked by deep necrotic ulcers that rapidly enlarge, deepen and lead to extensive tissue damage.

Diagnosing is made through clinical evaluation, histopathology of skin biopsies and serology. The pathogenesis involves complex immunological mechanisms, believed to involve dysregulated involvement of abnormal T cell subsets at the margins of the lesions that contribute to the destructive inflammatory response. Management requires a multidisciplinary approach. The primary goal is to control inflammation, promote wound healing and prevent complications. Systemic immunosuppressive (corticosteroids, cyclosporine and new generation immunosuppressive agents) are added for long term control.

Wound care is integral to facilitate the healing and minimize infection of PG. Surgical interventions has demonstrated varying outcomes, some with excellent results, while others have reported exacerbation of the disease and poor outcomes leading to further morbidity. Autologous aerosolized skin grafting previously exclusively used in burn surgery is an option for the treatment of complex wounds as it utilizes a smaller donor site to cover a larger area.

AIM

As a strategy for limb salvage, we present he use of a novel surgical technique using wide mesh and autologous aerosolized skin grafting for the closure of complex Pyoderma Gangrenosum wounds.

DESCRIPTION

All patients were seen and evaluated by a multidisciplinary team. Once a maintenance treatment was reached and the PG was quiescent, all patient underwent surgical debridement and were grafted with a 4:1 mesh and autologous aerosolized skin.

RESULTS

Case 1. 65M. DM2 and CAD referred for amputation by PMD for a none healing wound that progressively worsen over the las

Admission day | Pre-Op Day | POD 10

Case 2. 56M initially treated for necrotizing soft tissue infection, underwent multiple debridements to BLE with worsening so year old wounds on both lower legs.

Admission day | Pre-Op Day | POD 2

Case 3. 42F hx. Lupus with an expanding RLE wound diagnosed with PG. She was placed on immunosuppressive medica lesions developed on BLE.

Consult Visit | Admission day | Pre-Op Day | POD 10

CONCLUSION

Surgical management of PG remains a topic of debate as it can lead to pathergy. There have been reports of favorable outcomes when employing gentle techniques. We present thr conjunction with maintenance immunosuppression underwent a wide mesh and aerosolized skin grafting with complete closure. Surgical intervention should be considered on a ca wide mesh and autologous aerosolized skin autographing shows promise in the treatment of wound ulcers related to pyoderma gangrenosum and further studies are need to evaluat

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Speaker

Lourdes Castanon
Director of Burn and Complex wounds
University of Arizona

Novel outpatient treatment of wet- cement alkali burns with a polylactide- based synthetic matrix (SUPRA SDRM) ®- the timing matters

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Background: Alkali burns resulting from cement exposure have an insidious onset that demand a timely diagnosis and targeted treatment. Patients often have exposure for hours without feeling discomfort. The calcium hydroxide and hydroxyl ion proton acceptors produced from the cement – water mix is exothermic and caustic with a pH as high as 12.9. This can result in microscopic deep tissue injury and liquefactive necrosis that continues to cause injury despite initial removal of the insult. The treatment for wet cement burns differs greatly, and prompt recognition is necessary.

Methods: We present a 29-year-old – male construction manager who presents post burn day 2 with a 0.5 percent TBSA deep- partial burn to the ventral right wrist. Our treatment algorithm included initial pH testing (wound pH 10.5), wound culture, thermal free- tissue excision and routine application of hypochlorous acid was the initial treatment for 48 hours. A ploylactide synthetic matrix graft was applied on post burn day 5 and 12 with a hypochlorous acid secondary dressing.

Results: Peak wound pH change resulted on post-burn day 7 (pH=8) and 14 (pH=7.2). We observed a robust dermal appendage infiltration with minimal granulation response on post burn day 7 and full epidermal coverage by post burn day 16, a mature flat scar and a sequelae of post-burn dyspigmentation. The patient was placed in a silicone compression for 2 weeks with return to full function.

Discussion: Early recognition and treatment of alkali burns are imperative. Implementation of a relevant treatment algorithm coupled with the use of a polylactide synthetic wound matrix is an alternative option for treatment of deep partial alkali burns of modest TBSA in the outpatient setting and may result in short healing times and avoidance of autografting.

Speaker

Marcus Yarbrough
Medical Director Alpha Wound Care
Alpha Wound Care Solutions and Wellness/ Bon Secours Hospital , National Vascular Associates

Outpatient reconstruction of traumatic dog bite avulsion injuries of the lower extremity with Kerecis (®) acellular fish graft and negative pressure wound therapy in a two-stage procedure

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Background: Dog bite avulsion injuries are common sources of morbidity requiring initial treatment in the emergency room. Management of skin avulsion injuries of the lower extremity may require coverage with large flaps or skin grafts. Use of Xenograft can be combined with negative pressure wound therapy in a two staged algorithm to optimize coverage of deep structure elements, wound bed preparation and ultimately epidermal regeneration.

Methods: We performed this technique in a 65-year-old -male who sustained a large full thickness (muscle and fascia) avulsion injury of the left thigh from a pit bull dog attack. Initial treatment in the ED resulted in inadvertent primary closure of the wound. Patient underwent debridement and compartment decompression. Patient was discharged 2 days later to our wound center. An algorithm of pH testing, wound culture, thermal free- tissue excision and hypochlorous acid-soaked white sponge with negative pressure wound vac therapy was applied for 2 weeks. The peri wound was undermined, and a 3 cm free flap sutured over the visible muscle rim. A single layer of meshed Kerecis Omega3 Marigen ® was applied with negative pressure wound therapy and compressive dressings for 2 weeks. Graft incorporation and wound bed viability was assessed at 2 weeks post graft application.

Results: We observed a robust hyper-granular over exposed muscle and fascia within week 1 of NPWV therapy and hypochlorous acid. At week 3, Kerecis xenograft resulted in complete incorporation, decrease in pain (Numerical Pain Rating Scale of 2), dermal appendage migration and at week 5; complete epidermal coverage. Overall appearance of the reconstructed area was satisfactory at week 5 (Vancouver Scar Scale Score of 9)

Discussion: The use of Kerecis ® acellular fish graft combined with negative pressure wound therapy is an alternative outpatient reconstructive option for managing extensive traumatic skin avulsion injuries. it reduces postoperative immobilization, avoids prolonged hospitalization, minimizes pain and restoration of functional and esthetic results in a two-stage repair algorithm.

Speaker

Marcus Yarbrough
Medical Director Alpha Wound Care
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Primary Closure and Steroid Injection Under Local Anesthesia for Surgical Site Opening Due to Spinal Fluid Leakage After Spinal Surgery: Three Case Reports.

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Purpose: Cerebrospinal fluid(CSF) leak after spinal surgery is a common but fatal complication. Continued leakage slows wound healing and causes wound opening. Additionally, opening wounds significantly increase the risk of infection. Treatment includes conservative treatment and surgical treatment. Conservative treatment has the disadvantage of taking a long time and recovery may be difficult. In the case of surgical treatment, general anesthesia is required and the field of surgery may be expanded. In recent spine surgeries, the incision area has tended to be smaller, which has the disadvantage of requiring additional incisions during surgical treatment. Accordingly, in this paper, we present three case reports of patient who underwent primary closure and steroid injection under local anesthesia for surgical site opening due to spinal fluid leakage that occurred after spinal surgery

Method: In this study, three patients underwent an open surgical site evaluation. (Table 1.) The wound was thoroughly cleaned to create a healthy bed. Subsequently, a primary closure was performed under local anesthesia. Steroid injection (triamcinolone 40mg + normal saline 30cc) was administered. The follow-up period lasted between 2 and 5 months.

Result: The first patient, a 49-year-old man, underwent unilateral laminectomy and bilateral decompression for spinal stenosis at a neurosurgery clinic. He was referred for surgical site fluctuations that occurred one month after surgery. The second patient, an 80-year-old female, underwent unilateral laminectomy and bilateral decompression for spinal stenosis in a neurosurgery department. The patient was referred due to surgical site opening and effusion that occurred 2 weeks after surgery. The third patient, a 67-year-old female, underwent Direct Lateral Interbody Fusion (DLIF) for spondylolisthesis at an orthopedic surgery center. One month after surgery, she was referred for surgical site disruption. After cleaning the wound, primary suture was performed under local anesthesia. After primary closing, fluctuations due to CSF leakage were observed. An abdominal band was maintained immediately after surgery, and steroid injections were administered. Subsequently, the patient's condition stabilized, and a full recovery was observed without any further complications.

Conclusion: When a wound opening due to CSF leakage occurs, steroid injection after wound closure using local anesthesia is an effective treatment option. This method is recommended for patients for whom general anesthesia is difficult or for patients with fixation devices without infection.

Table 1. Demographic characteristics of the patients.

Case	Sex	Age	BMI	Past History	Diagnosis	Surgery
1	M	49	26.79	Hypertension Gout Smoking	Spinal stenosis L3/4	ULBD, L3/4 4/5, Lt.
2	F	80	27.09	Hypertension Dyslipidemia	Spinal stenosis L3/4 4/5	ULBD L3/4 4/5, Lt.. Microdisectomy L3/4, Lt.
3	F	67	28.88	Hypertension Diabetes mellitus Hypothyroidism	1. SPLT, L2-3 2. Retrolisthesis, L3-4 3. Central stenosis, L2-3 4. Foraminal stenosis, L3-4-5-S1	DLIF, L2-5

ULBD: unilateral laminectomy and bilateral decompression, SPLT: Spondylolisthesis, DLIF: Direct Lateral Interbody Fusion

Table 2. Steroid injection outcomes for wound disruption due to CSF leakage following spinal surgery

	Number of steroid injections after primary closure	Period of follow-up (Wound disruption / fluctuation / infection)		
Case	Number / POD	1M	3M	5M
1	#2 / #10D, #19D	(-/+/-)	(-/-/-)	(-/-/-)
2	#1 / #14D	(-/-/-)	(-/-/-)	
3	#1 / #10D	(-/-/-)	(-/-/-)	

POD: Postoperative day, M: month, D: day

Speaker

Marhip Anh
Clinical fellow
The Catholic University of Korea, Bucheon ST. Mary's Hospital

The Use of the SBAR Tool to identify and Prevent Complications in Care

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

BACKGROUND/KNOWLEDGE GAP:

Historically, any complications in burn care has been reviewed during the programs monthly mortality and morbidity review. These complications typically trended toward being more serious events. During these reviews, the team would go over if any factors came into play that could have prevented these issues. It is extremely important as a program that we review these cases but the questions arises if there is a way to catch these complications before they happen. By doing the M&M review, we can create policy and procedure changes in order to prevent these, but is there a method to use as another safety net to really stop these issues in real time. This is when the team had come up with the idea to address issues in real time and also perform a review on a more frequent level. With the help of the Burn Program Manager and the Assistant Nurse Manager, they had started to implement the use of an SBAR Tool to write any issues that happen in care that they could catch during daily nurse report. The Situation, Background, Assessment, and Recommendation (SBAR) tool, initially developed by the US Navy, was disseminated by the Institute for Health Promotion as an easy and effective tool for shift reporting. This tool decreases communication mistakes during shift report through consistent communication.

Ghonem NME-S, El-Husany WA. SBAR Shift Report Training Program and its Effect on Nurses' Knowledge and Practice and Their Perception of Shift Handoff Communication. SAGE Open Nursing. 2023;9. doi:10.1177/23779608231159340

METHODS/DESIGN:

The use of this tool is set up as a document that all members of the burn team can constantly review if/when issues arise. The document is set up as a chart where it states the Situation, so this is the section where the exact circumstances of the situation get explained. Non-essential information is excluded. The focus should be on the seriousness of the situation. The next part is the Background. This is where essential information related to the situation. This information should pertain only to the current situation. Following this is the Assessment. This includes a precise statement based on the situation and background information. The assessment must be made by a qualified staff person. The last section is the Recommendation. This would be the qualified staff person makes a recommendation for resolving the issue based on the situation, background, and assessment.

BURN SBAR

MRN:_____ DATE: _____

1. Situation In this initial section, the exact circumstances of the situation get explained. Non-essential information is excluded. The focus should be on the seriousness of the situation.	
2. Background The background section presents essential information related to the situation. This information should pertain only to the current situation.	
3. Assessment The assessment is a precise statement based on the situation and background information. The assessment must be made by a qualified staff person.	
4. Recommendation The qualified staff person makes a recommendation for resolving the issue based on the situation, background, and assessment.	

After daily nursing rounds. The designated team members will fill in the document if any issues did arise during shift report. This is also an on-going evaluation throughout the day while the team in onsite.

OUTCOME MEASURES

When it comes to reviewing this document, this will be done at the minimum of a weekly basis. It is schedule for every week after multidisplinary rounds, but if more serious SBARs are present this will be reviewed at a quicker time frame.

These SBARs will be ranked into 3 categories when reviewed by the whole burn team. The first category will be those that are quick fixes or simple errors that can be fixed by real time conversations and some education. The intermediate category will be those events that require more interventions in place. This could include formal education for all staff, policy and producer changes, etc. The serious event category will be those events that must be reported out during M&M and have peer to peer reviews completed.

With having the ability to track and trend these issues, the team will be able to have a better understanding of how they can break down issues and the real cause of something simple or something more serious.

RESULTS/FINDINGS

The findings have resulted in a way that we have been able to report out less serious events due to having this SBAR tool to prevent small issues into becoming large ones. The team plans on keeping this running for a year to compare the amount of M&M reviews to the previous year. They will also be looking at the 3 different categories to evaluate if any of the small issues prevented them from moving up the different ranks of events. This will continue to be reviewed at the multidisplinary level with the attending physicians being the main reviewers of the SBARs

CONCLUSION/IMPLICATIONS

Mistakes can happen every day but can be avoided and stopped before becoming serious with some simple communication. This SBAR tool is a simple and easy way to track any and all errors in care and to help guide the team to drive their practice to result in the best outcomes for the patient.

Resources:

Ghonem NME-S, El-Husany WA. SBAR Shift Report Training Program and its Effect on Nurses' Knowledge and Practice and Their Perception of Shift Handoff Communication. SAGE Open Nursing. 2023;9. doi:10.1177/23779608231159340

Speaker

Mariah Sturges
Burn Program Coordinator/ Assisant Nurse Manager
AHN West Penn Hospital

DEFINITIVE WOUND CLOSURE OF A LARGE SCALP MOH'S DEFECT WITH EXPOSED CRANIUM IN AN IRRADIATED FIELD UTILIZING A FISH SKIN XENOGRAFT

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction

Moh's micrographic surgery is a tissue sparing technique used in the treatment of nonmelanoma skin cancers. Reconstruction of soft tissue defects after Moh's surgery can be a substantial challenge. In wounds with exposed underlying bone, there are limited reconstructive options. Closure can be further complicated if the area received prior radiation therapy.

Methods

The patient is a 78 year old white female, who was status post resection of a right parietal scalp sarcoma with a titanium plate cranioplasty and rotation flap reconstruction approximately 10 years ago. Her surgery was followed by adjuvant radiation therapy. Past medical history is pertinent for noninsulin dependent diabetes mellitus and venous thromboembolism, requiring active anticoagulation. In July 2022, the patient underwent Moh's excision for a poorly differentiated squamous cell carcinoma of her vertex scalp within the prior radiation field. It required multiple passes for definitive oncological clearance. This resulted in a 7 by 5 cm defect with exposed cranium. The following day, she was taken to the OR for bone burring and omega 3 fish skin xenograft placement. A nonadherent compressive postoperative dressing was applied and the patient's anticoagulation was restarted on postoperative day #1.

Results

After 8 applications of the fish skin xenograft at weekly or biweekly intervals, the wound completely healed without need for staged surgical reconstruction.

Discussion

Omega 3 fish skin xenografts are FDA approved for the treatment of chronic and acute surgical wounds. The product is an acellular dermal matrix harvested from Icelandic cod, with a porous microstructure similar to human skin. Characteristics of the xenograft include bacterial resistance, angiogenesis, and inflammatory cytokine mitigation. As shown by this case report, a fish skin xenograft is suitable for complex wound closure, including difficult Moh's reconstruction.

Speaker

Mark Suski
Plastic Surgeon/Medical Director
Los Robles Medical Center

Treating 3rd degree burn on the anterior abdominal wall of a paraplegic patient with an advanced thermo-reversable antiseptic hydrogel.

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Speaker

Michelle Moore
Vice President of Clinical Services
Kaleidoscope Clinical Consulting

The Use of a Novel Antimicrobial Matrix in the Management of a 5-Year-Old Venous Leg Ulcer

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Prospective studies have shown that a synthetic, ultrathin, resorbable wound matrix accelerates wound healing in chronic wounds. An additional prospective study showed dramatic reduction in the amount of wound drainage in 30/30 patients with complex lower extremity ulcers. Unfortunately recalcitrant venous leg ulcers have significant and life altering impacts on patients and families and remain an unsolved problem for wound clinics. Surgical intervention and skin grafts have a high failure rate due to bacterial overgrowth and wound drainage mandating ongoing topical antimicrobials and compression wraps.

A 41 y/o woman with a 5-year history of venous leg ulcer nonresponsive to wound clinic protocols was referred for consideration of operative intervention. Preoperatively the patient was treated with three applications of the antimicrobial matrix and 4-layer compression wraps in the week prior to operative intervention. Surgical technique consisted of meshed autograft 225 cm2 with sprayed-on epidermal autografts and immediate placement of the antimicrobial matrix and usual outer dressing. The postoperative management included compression wraps and replacement of the matrix over areas of drainage with each dressing change. The overall outcome was durable graft take and wound closure

The antimicrobial resorbable matrix could be an ideal adjunct for use in complex venous leg ulcer skin grafting cases. The antimicrobial characteristics and moisture control properties are ideal for this complex disease.

Speaker

Michael Schurr
Chair, Department of Surgery
MAHEC

Topical mafenide acetate quality improvement project

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

At the Lehigh Valley Health Network Regional Burn Center, we often treat patients with topical mafenide acetate. The Journal of Burn Care and Research found that 2.5% mafenide acetate was as effective compared to 5% mafenide acetate, which led to a change in our dosage. The purpose of this quality improvement project is to determine if there is a difference in burn patients treated with topical mafenide acetate before and during COVID-19. Our goal was to determine if there has been an increase in infection rates due to the lower dose in addition to the lack of personal protective equipment during COVID-19.

Speaker

Sigrid Blome-Eberwein
Associate Director Burn center
Lvhn

Secondary Intention Healing After Surgical Excision of Hidradenitis Suppurativa

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Background: Hidradenitis suppurativa (HS) is a chronic, debilitating skin disease, characterized by recurrent inflammatory boils and abscesses, mainly located in the inverse body areas. Early wide surgical excision is important and effective in order to prevent complications, however, reconstruction is quite challenging, often requiring skin graft or skin flap. To evaluate the efficacy of secondary intention healing after wide excision for treating severe HS

Method: Over the last 10 years, 9 patients with severe HS (Hurley grade II and III) underwent surgical excision/wide exteriorization with reconstruction using secondary intention healing and artificial collagen insertion. We evaluated and compared intraoperative and post-operative data, retrospectively.

Results: Seven patients (77. 77 %) showed no recurrence after surgery. The mean treatment time to complete wound healing was 115 ± 110 days (range, 36 – 339 days). The mean disease-free duration after treatment was 665 ± 283 (range, 123 – 924 days).

Conclusion: Based on our experience, secondary intention healing after excision is an effective treatment option for patients with severe HS presenting multiple interconnected tracts and abscesses.

Reference:

1. Joerg-peter Ritz., Norbert Runkel., Joerg Haier.(1998). Extent of surgery and recurrence rate of hidradenitis suppurativa. Int J Colorect Dis.13:164-168. Springer-Verlag 1998

2. Ziyad Alharbi., Jens Kauczok., Norbert Pallua.(2012) A review of wide surgical excision of hidradenitis suppurativa. BMC Dermatology 2012, 12;9

Speaker

Kyoung Ae Nam
Wound Care Specialist, RN, MSN
Yonsei University SEVERANCE HOSPITAL, Dept. of Dermatology

Relationship of early dressing change to discharge on lower extremity grafts

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

We were inspired to do this project because we noticed disagreements between those in the Burn community as to when it is safe to start ambulating patients who underwent lower extremity skin grafting. We performed a retrospective chart review on all patients who were admitted to the burn center, regardless of age and comorbidities. The data we found is a great resource for the Burn community and has the potential to benefit a large population of patients.

Speaker

Sigrid Blome-Eberwein
Associate Director Burn center
Lvhn

Effects of a Copper-Iodine Complex Wound Irrigation Solution on the reduction of biofilms on implant materials and in vivo porcine wounds

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction

Clyra's "Bioclynse®" Wound Irrigation Solution (WIS) is an FDA 510(k) cleared medical device indicated in wound management, cleansing, irrigating, moisturizing, and debriding of acute and chronic dermal lesions that are partial or full thickness wounds. These indications include 1st and 2nd degree burns, stage I–IV pressure ulcers, diabetic ulcers, stasis ulcers, abrasions and minor skin irritations, post-surgical wounds, grafted and donor sites.

The WIS Preservative in Solution is based on a powerful Copper-Iodine Complex technology that releases a tailored amount of free iodine, I_2 (up to 250 ppm). This free iodine, acting in concert with copper ions, produces a synergistic effect that helps remove contamination within the solution and assists in the cleansing, irrigating, and debriding of wounds. The mechanism of action of the WIS is based on mechanical action of the pressurized fluid coming from the dispensing container or through a pulsed lavage system, which moves across the wound surface aiding in the removal of contamination or foreign objects such as dirt, debris or microorganisms.

This unique Copper-Iodine Complex of the WIS's preservative can neutralize a broad number of pathogens such as bacteria, viruses, yeast, and fungi without evoking bacterial resistance [1-4]. The WIS has been proven to be safe, non-cytotoxic, non-pyrogenic, non-irritating, and non-sensitizing to dermal tissue[5,6]. It can be applied directly to the wound bed and can be used with static or pulsed lavage, ultrasonic debridement and negative pressure wound therapy (instillation mode). Also, importantly, it does not need to be rinsed after treatment or application in either static or dynamic mode, potentially reducing procedure times.

The purpose of this study is to quantitatively evaluate the effect of the Copper-Iodine Complex Wound Irrigation Solution on biofilm on two commonly used implant material substrates (silicone and titanium alloy), and in an *in vivo* porcine model.

Materials and Methods

Trial #1 - Silicone Trial - mature biofilms of *S. epidermidis* ATCC 35984 were grown for 48 hours on smooth silicone breast implant shell material coupons (1 cm^2) using a CDC Biofilm Reactor. The reduction of biofilm was evaluated at three exposure times (5h, 24h, and 72h). Three independent experiments were conducted, and log reduction data were plotted as mean values with standard deviations. Untreated silicone coupons with initial bacterial load of-107 CFU/cm2 acted as controls.

The testing approach used methods adapted from ASTM E3161-18, "Standard Practice for Preparing A *Pseudomonas aeruginosa* Or *Staphylococcus aureus* Biofilm Using The CDC Biofilm Reactor".

For comparison purposes, efficacy data for other commercially available wound cleansers against *S. epidermidis* were drawn from published information, where their biofilms were grown on hydroxyapatite or titanium alloy substrates. Contact times of Irrisept, Betadine, Vashe and Bactisure are determined by manufacturer's instructions and the need to rinse out.

Trial #2 - Titanium Alloy Trial - mature biofilms of *Staphylococcus aureus* (MRSA) MBL strain 10943, a clinical chronic wound isolate, were grown for 72h on Grade 5 (6AL-4V) titanium coupons (18.75 cm2) using a Drip Flow Biofilm Reactor® **.** Three independent experiments were conducted, each with evaluation of biofilm reduction at four exposure times (5 min, 0.5h, 2h, and 24h) as shown in Table 3.

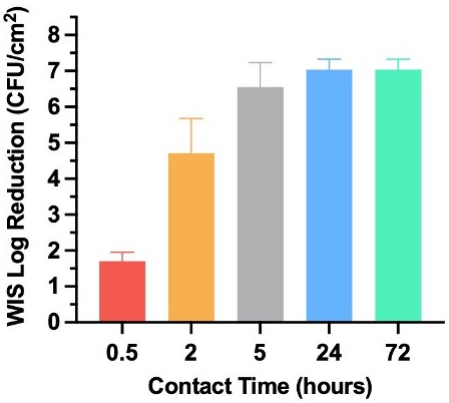
A variation of this study was then performed using a pulsed lavage system (InterPulse® by Stryker) for 1.5 min (time required to dispense an entire 32oz WIS bottle) simulating an irrigation procedure. The coupons were irrigated at a distance of 3±1 inches with the pulsed lavage system guided over the coupon back and forth at approximately 1 sweep per second. After spraying, coupons were returned to the DFR and maintained under static immersion for 30 min and 2 hours. Untreated Grade 5 (6AL-4V) titanium coupons with initial bacterial load of 106-107 CFU/cm2 acted as controls.
The testing approaches used methods adapted from ASTM E2647-20, "Standard Test Method for Quantification of *Pseudomonas aeruginosa* Biofilm Grown Using Drip Flow Biofilm Reactor with Low Shear and Continuous Flow".

Trial #3 - Porcine Model Trial (in vivo) – the final trial centered on a GLP *in vivo* porcine model to assess the antibiofilm and antimicrobial activity utilizing WIS. Acute full thickness wounds were created on the back of a pig and then treated with WIS or left untreated (controls). Thereafter, a combination of bacteria (*Staphylococcus epidermidis* (coagulase-negative staphylococci (CNS))), *Pseudomonas aeruginosa* (pig clinical isolate, *Fusobacterium sp.*) were applied to these wounds to create mature biofilms and assess the infection-protective activity across the different treatments and control groups. The wounds were treated with WIS 24 hours after infection. Four hours after treatment, the dressings were removed, and all wounds were biopsied for microbiology.

Results

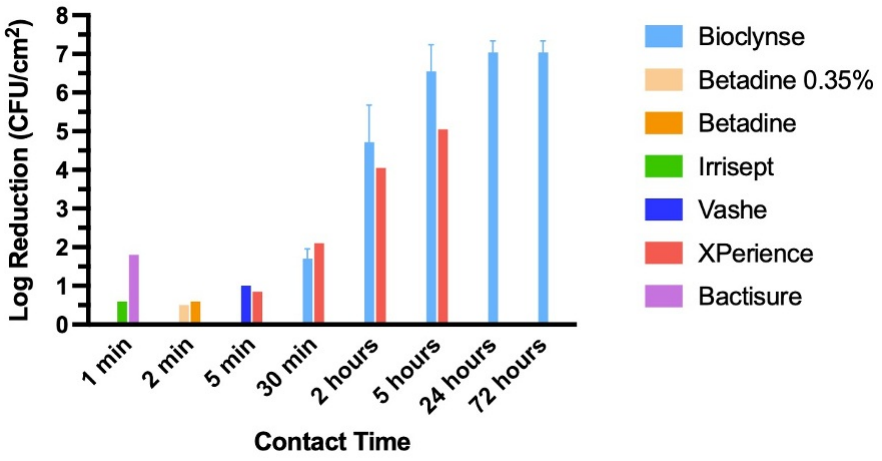
Silicone Trial - efficacy of WIS Copper-Iodine Complex against mature *S. epidermidis* biofilms on silicone substrate, comparison with other commercially available wound cleansers

Results: 1.7 log reduction at 30 min / 4.7 log reduction at 2 hours / 6.6 log reduction at 5 hours / 7.0 log reduction at 24h and 72h. No colonies observed at 24h and 72h .



Data was analyzed with one-way Anova and Tukey post-hoc tests, p-value: < 0.05

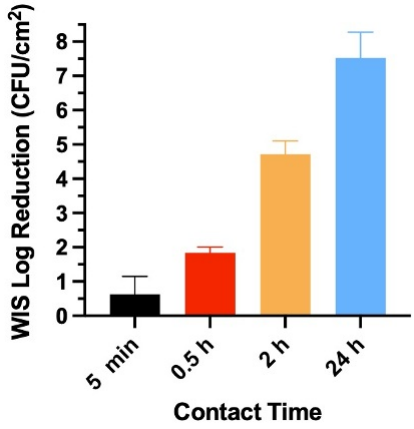
Biofilm test conducted by the Center for Biofilm Engineering at Montana State Univ.



Comparison efficacy data for other commercial wound cleansers based on published data.

Titanium Alloy Trial - efficacy of WIS Copper-Iodine Complex against mature *S. aureus* biofilms on titanium alloy substrate

Results: 0.6 log reduction at 5 min / 1.8 log reduction at 0.5 hours / 4.7 log reduction at 2 hours / 7.5 log reduction at 24h. No colonies observed at 24h .

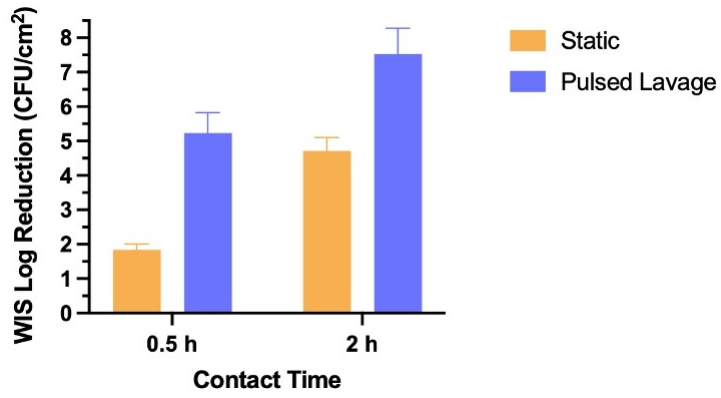


Data was analyzed with one-way Anova and Tukey post-hoc tests, p-value: < 0.05

Biofilm test conducted by the Center for Biofilm Engineering at Montana State Univ.

Titanium Alloy Trial with Pulsed Irrigation - further increase in efficacy of WIS Copper-Iodine Complex against mature *S. aureus* biofilms on titanium alloy substrate

Results: use of a pulsed irrigation system incorporating WIS increased the efficacy of biofilm reduction on titanium alloy substrate by up to three orders of magnitude, from 1.8 log reduction (no lavage) to 5.2 log reduction (with pulsed lavage) at 30 min, and from 4.5 log reduction (no lavage) to a full 7.5 log reduction (with pulsed lavage) at 2 hours.



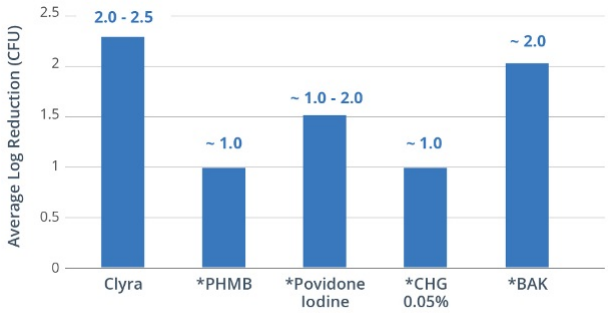
Data was analyzed with one-way Anova and Tukey post-hoc tests, p-value: < 0.05

Biofilm test conducted by the Center for Biofilm Engineering at Montana State Univ.

Porcine model *in vivo* Trial - to assess the anti-biofilm and antimicrobial activity.

Results: WIS Copper-Iodine Complex reduced total bacteria in the biofilm by 2.0 – 2.5 log CFUs compared to initial inoculation level.

Comparison of WIS *in vivo* antibiofilm efficacy with *in vivo* antibiofilm efficacy data of other commercially available wound cleansers drawn from published information and retrospective data collection and analysis.



*Retrospective Data Collection and Analysis

Conclusion

Bioclynse® Wound Irrigation Solution generated a significant log reduction in the growth of Staph epidermidis and Staph aureus biofilms grown respectively on silicone and titanium implant materials. Biofilms were also significantly reduced in an *in vivo* wound porcine model. This offers potentially far reaching clinical applications and the chance to positively impact patient outcomes, especially considering the significant personal, clinical and financial burdens posed by septic implants. Further studies will follow to demonstrate that it can help both prevent and treat infected implants in humans.

References

1. GLP Time Kill Study 2016-2018. Nelson Laboratories
2. Antimicrobial Effectiveness Test (USP<51>) 2018. KLM Labs
3. Efficacy Test for SARS-CoV-2 Inactivation 2020. Galveston Nat'l Lab, Univ of Texas
4. Time Kill & Persistence Test 2023. Biolargo Water Laboratory, Univ. of Alberta
5. GLP Wound Healing Study (porcine wound model) 2019. Bridge PTS
6. GLP Cytotoxicity Test 2018, GLP Sensitization Test 2018, GLP Pyrogenicity Test 2018, GLP Skin Irritation Test 2019. Nelson Laboratories

- Additional statistical information and further references available on request.

Speaker

Steven J. Kavros, DPM
Advanced Wound Healing, Limb Preservation
Vascular Surgery Associates

A Copper-Iodine Complex-based wound irrigation solution with persistent and long-lasting activity against clinically relevant pathogens: an in vitro model

5:00 PM - 6:00 PM, Jan 29

Poster Presenta…

Introduction

Clyra's "Bioclynse®" Wound Irrigation Solution (WIS) is an FDA 510(k) cleared medical device. The WIS is indicated in wound management, cleansing, irrigating, moisturizing, and debriding of acute and chronic dermal lesions that are partial or full thickness wounds. These indications include 1st and 2nd degree burns, stage I–IV pressure ulcers, diabetic ulcers, stasis ulcers, abrasions and minor skin irritations, post-surgical wounds, grafted and donor sites.

The WIS Preservative in Solution is based on a powerful Copper-Iodine Complex technology that releases a tailored amount of free iodine, I_2 (up to 250 ppm). This free iodine, acting in concert with copper ions, produces a synergistic effect that helps remove contamination within the solution and assists in the cleansing, irrigating, and debriding of wounds. The mechanism of action of the WIS is based on mechanical action of the pressurized fluid coming from the dispensing container or through a pulsed lavage system, which moves across the wound surface aiding in the removal of contamination or foreign objects such as dirt, debris or microorganisms.

This unique Copper-Iodine Complex of the WIS's preservative can neutralize a broad number of pathogens such as bacteria, viruses, yeast, and fungi without evoking bacterial resistance [1-4]. The WIS has been proven to be safe, non-cytotoxic, non-pyrogenic, non-irritating, and non-sensitizing to dermal tissue[5,6]. It can be applied directly to the wound bed and can be used with static or pulsed lavage, ultrasonic debridement and negative pressure wound therapy (instillation mode). Also, importantly, it does not need to be rinsed after treatment or application in either static or dynamic mode, potentially reducing procedure times.

The purpose of this study is to quantitatively evaluate the effect of the Wound Irrigation System (WIS) on bacteria, yeast, fungi, and SARS-CoV-2 virus in an *in vitro* model.

Materials and Methods

Trial #1 - Antimicrobial efficacy testing of WIS as a preservative in solution against five common organisms at 14 and 28 days, using the USP <51> test method.

Trial #2 - Time-Kill Data determination of WIS against 15 clinically relevant pathogens. Spiral and pour plate methods were used to examine antimicrobial activity of WIS. Tubes containing 10 mL of the test article were challenged with 0.10 mL test organism to yield ~10^6 CFU/mL. The test articles were mixed thoroughly.

At each time point, 1 mL aliquots of the test suspension were removed and added to 9 mL DEYE. Alternatively, 900 µl aliquots of the test suspension were removed and added to 110 µl 0.5M sodium thiosulfate, 9% saline solution. The tubes were mixed thoroughly. Samples were plates using a pour plate method. 1 mL aliquot was added to an empty petri dish. Molten agar (15 mL) was added and swirled to mix. Once agar had solidified, plates were incubated for 24-48 hours under organism appropriate conditions. Titer controls were also prepared.

The log reduction values were calculated using the following formula:

$$\text{Log reduction} = \log_{10} U - \log_{10} C$$

Where: U = Average titer control

C = Average recovered counts

The percent reduction values were calculated using the following formula:

$$\% \text{ reduction} = (1 - 1/10^{(\log \text{ reduction})}) \times 100\%$$

Trial #3 - Persistent antimicrobial efficacy determination of WIS against clinically relevant pathogens in the face of pathogen re-inoculation at 3 different time points. Test followed the same culture and plating procedure as Time-Kill test, with pathogen re-inoculations at 10 minutes, 4 hours, and 24 hours after initial inoculation.

Trial #4 - Validate efficacy of WIS against SARS-CoV-2 . A virus stock concentration of 1x10 ^{6} median tissue culture infectious dose ($TCID_{50}$) per mL was used. Aliquots of stock virus (10 µl) were mixed with 90 µl of WIS or control solutions. Room temperature water was used as a negative control for virus inactivation, while boiling water (water pre-heated to 100°C) was used as a positive control. All mixtures were incubated for 30 seconds, 10 minutes, 30 minutes, or 60 minutes at room temperature, at which time 900 µl infection medium was added to neutralize antiviral activity. Subsequently, the SARS-CoV-2 viral titer ($TCID_{50}$/mL) for each test substance was determined. The experiment was conducted in triplicate.

Results

Antimicrobial Efficacy Test per USP <51> of WIS

Copper-Iodine Complex as Preservative in Solution

Results: WIS meets USP criteria for antimicrobial effectiveness for category 2

Organism	**Log $_{10}$ reduction 14 days**	**Log $_{10}$ reduction 28 days**
E. coli	>5.7	>5.7
P. aeruginosa	>5.3	>5.3
S. aureus	>5.4	>5.4
Candida	>5.3	>5.3
Aspergillus	>5.1	>5.1

* Test performed by KML Laboratories, an FDA registered and ISO 17025 certified laboratory.

Time-Kill Data of WIS Copper-Iodine Complex against Clinically Relevant Pathogens

Microorganism	**Exposure Time**	**Percent Reduction**	**Log_{10} Reduction**
Staphylococcus epidermidis	10 min	> 99.99998	>6.7
	24 hours	> 99.99998	>6.7
ATCC 35984			
Staphylococcus aureus	10 min	> 99.99998	>6.7
ATCC 6538	24 hours	> 99.99998	>6.7
Streptococcus salivarius	10 min	> 99.99991	>6.1
	24 hours	> 99.99991	>6.1
FUA3532			
Streptococcus pyogenes	10 min	> 99.99998	>7.0
	24 hours	> 99.99998	>7.0
ATCC 19615			
Enterococcus faecalis	10 min	~ 99.99981	~5.7
	24 hours	> 99.99998	>6.7
ATCC 29212			
Cutibacterium acnes	10 min	~ 99.9993	>6.2
	24 hours	> 99.99993	>6.2
ATCC 11827			
Escherichia coli	10 min	> 99.99999	>6.9
	24 hours	> 99.99999	>6.9
ATCC 25922			
Proteus mirabilis	10 min	> 99.99999	>6.9
	24 hours	> 99.99999	>6.9
ATCC 29906			
Candida tropicalis	30 min	> 99.99915	>5.1
	24 hours	> 99.99915	>5.1
ATCC 750			
Candida albicans	30 min	> 99.99952	>5.3
	24 hours	> 99.99952	>5.3
ATCC 10231			
Enterococcus faecium	10 min	> 99.99998	>6.7
	24 hours	> 99.99998	>6.7
ATCC 19434			
Klebsiella pneumoniae	10 min	~ 99.9997	~5.8
	24 hours	> 99.99999	>6.8
subsp. *pneumoniae* ATCC 4352			
Pseudomonas aeruginosa	10 min	> 99.99997	>6.5
	24 hours	> 99.99997	>6.5
ATCC 10145			
Klebsiella aerogenes	10 min	> 99.99999	>7.0
	24 hours	> 99.99999	>7.0
ATCC 13048			
Acinetobacter baumanii	10 min	> 99.99999	>6.9
	24 hours	> 99.99999	>6.9
ATCC 19606			

* Tests performed by Nelson Labs, Biolargo Water and Keystone Labs.

Long-lasting WIS efficacy against ESKAPE pathogens and Candida albicans and Candida tropicalis has been demonstrated up to 3 days (Data on File).

Speaker

Steven J. Kavros, DPM
Advanced Wound Healing, Limb Preservation
Vascular Surgery Associates

Successful coverage of Purpura Fulminans Wounds of the Abdomen, Buttocks, and Thighs with a Meshed Autograft, Autologous Skin Cell Suspension (ASCS), and Cadaveric Composite Technique
5:00 PM - 6:00 PM, Jan 29
Poster Presenta…

Speaker

George Abboud
Clinical Research Coordinator
The Ohio State University Wexner Medical Center

Reduction of donor skin requirements in individuals with full-thickness, non-thermal wounds using a point-of-care autologous cell harvesting device combined with meshed autograft
5:00 PM - 6:00 PM, Jan 29
Poster Presenta…

Speaker

Camy Bell
Director, Medical Affairs-Wound Healing
AVITA Medical

Optimizing Skin Graft Success Using Aseptically Processed Dehydrated Allograft Placental Membrane
5:00 PM - 6:00 PM, Jan 29
Pikake I & II Foyer
Poster Presenta…

Speaker

Michael N. Desvigne
Plastic Surgeon
Abrazo Arrowhead Hospital

Tue, Jan 30, 2024

6:30 AM

Registration | Information Desk Open
6:30 AM - 12:00 PM, Jan 30
Aulani Foyer
General Meet…

ProgenaCare Breakfast Symposium: From Fresh Start to Finish: revyveTM Antimicrobial Wound Gel and ProgenaMatrixR Human Keratin Matrix in the Treatment of Chronic Wounds
6:30 AM - 7:30 AM, Jan 30
Puakenikeni Room
General Meet…

The presentation will trace key milestones in wound treatment from addressing bioburden at the initiation of treatment to wound closure and disucss two innovative products to support the healing process. Dr. Schultz will present general considerations relating to biofilms and wound healing, discuss the components of the revyve Antimicrobial Wound Gel including its thermo-reversible plutonic surfactant, and present laboratory and clinical data relating to the gel. Dr. Zelen will present product information and laboratory and preclinical data relating to ProgenaMatrix, the first and only human matrix, and share his clinical experience with the product including select cases.

Speakers

Charles Zelen
peri

Gregory Schultz
Professor Emeritus
University of Florida

7:00 AM

Continental Breakfast
7:00 AM - 8:00 AM, Jan 30
Exhibit Hall
General Meet…

7:45 AM

Initial Clinical Experience with a Collagen-Elastin Matrix
7:45 AM - 8:00 AM, Jan 30
Pikake I & II
Skin Substit…

Our American Burn Association verified burn center began a clinical evaluation period of a new collagen elastin matrix (CEM). During this period, each of three attending surgeons selectively applied CEM as deemed useful. Here we examine our initial collective experiences.

Since June 2023, we have used CEM in the treatment of 19 patients with the following demographics: mean age of 46 years, 4 female, 15 male, 1 Black, 3 non-white, and 15 white. The average TBSA was 12% with an average full thickness TBSA of 10%. There were no inhalation injuries.

The mean time between application of CEM and autografting was 11 days. In two cases, definitive coverage involved a locoregional flap. In two cases, local reconstruction was not possible due to non-viable wound base.

We conclude that CEM is a valuable tool in the treatment of patients with significant skin injury treated at a referral burn center. Further, CEM seems to effectively fill a need for faster coverage of surgically prepared wounds. Through our evaluation of CEM, we are reminded of the need for a clinically-based classification of the greater family of skin substitutes to help facilitate our professional understanding and communication.

Speaker

Kevin Bailey
Surgeon
WFBMC (Burn Center)

8:00 AM

Filling the Void: Ovine ECM Grafts Support Closure of Large Volume Trauma Defects

8:00 AM - 8:15 AM, Jan 30
Pikake I & II

Skin Substit…

Introduction: Rapid closure of traumatic wounds remains an important endeavor in the treatment of trauma patients. Ovine forestomach matrix (OFM) leverages the inherent wound healing properties of the extracellular matrix to maximize tissue repair and has reported to be of great utility in a diverse array of wounds. Of particular interest to the U.S. military are deep traumatic wounds that require infill before closure at the skin level can be obtained. Herein, we describe the military experience with an OFM graft in the reconstruction of battlefield-relevant soft tissue injuries.

Methods: The OFM graft was available at our institution as both a sheet † and morselized‡ format and was used as the discretion of the treating trauma surgeon. Products were utilized as a single application and repeated application as the wound bed warranted. Patients were treated in both the inpatient and outpatient settings.

Results: The OFM grafts were utilized in several wound types, including a dog bite, a gunshot wound to the leg requiring profunda femoral artery ligation, fascial dehiscence after exploratory laparotomy with exposed colon, and wound dehiscence of a superficial femoral artery interposition graft after a gunshot wound to the leg. The dog bite and gunshot wound cases highlighted the impressive ability of a single application of the morselized graft to provide volumetric tissue infill and decrease the dead space of the wound by greater than 50% in a 1-week timeframe. The morselized graft was also successful in rapid granulation tissue formation in both dehiscence cases and proved safe to apply over exposed colon after a single application of another biologic.

Conclusions: OFM graft technology has a unique ability to rapidly fill in dead space in deep wounds in a short timeframe, which is of great utility in battlefield-relevant wounds such as gunshot wounds and blast injury. Further investigation into expanded use of this graft is necessary to fully elucidate its full clinical capabilities across the spectrum of traumatic soft tissue injuries.

Speaker

Julie Rizzo
MD
Brooke Army Medical Center

8:15 AM

Marijuana Legalization Effect on Burn Admissions

8:15 AM - 8:30 AM, Jan 30
Pikake I & II

Msc./Economy/Basic S…

In November 2000, Colorado became the eighth state to legalize medical marijuana. Burn Units immediately saw in increase in marijuana related injuries. Most of these were from manufacturing THC. In November 2012, Colorado legalized recreational marijuana and Burn Unit admissions increased again and for the same reason. This talk will review why marijuana manufacturing is so dangerous and what additional treatments are needed for burn patients who consume large amount of marijuana. Finally, Colorado passed laws regulating marijuana manufacturing processes which ended the epidemic of burn admissions. These laws will be discussed, along with the industries they created. Finally, the current economic picture of the marijuana industry and its effects on state incomes will be discussed.

Speaker

Gordon Lindberg
Intensivist
St. Mary's Medical Center

8:30 AM

The Use of Therapeutic Peptides in Combination with Full-Thickness Skin Columns to Improve Healing of Excisional Wounds

8:30 AM - 8:45 AM, Jan 30
Pikake I & II

Surgical

Introduction: Split thickness skin graft (STSG), the standard of care of skin replacement therapy, lacks adnexal structures as a very thin layer of skin is grafted that only contains the epidermis and a small portion of the dermis. This is done to create a quick coverage on the receiving site but also to minimize donor site morbidity. One of the drawbacks of STSG is the absence of adnexal structures and thus the grafted wounds lack basic skin functions such as durability, thermoregulation, maintenance of hydration and lubrication. An alternative technique to solve this problem is fractional autologous skin grafting using full-thickness skin columns (FTSC). Harvesting occurs orthogonally by taking numerous individual skin columns containing the epidermis down through the dermis including the skin appendages. Bioactive peptides have been shown to rescue hair follicular unit survivals. Therefore, the purpose of this study is to investigate whether transplantation of FTSCs in combination with bioactive peptides would better reconstitute skin function due to the positive effect of the peptides on adnexal structures within full-thickness skin columns.

Methods: Up to 16 standardized full-thickness excisional wounds (Æ 5 cm) were created on the dorsum of two anesthetized pigs. Analgesia was provided prior to all surgical procedures with buprenorphine and the animals were monitored for pain twice every 24 hours for the first 72 hours. FTSC biopsies (Æ 1.5 mm) were harvested from donor sites located on the cranial-dorsum at a ratio of up to sixteen 1.5 mm-diameter skin columns/1cm^2. Subsequently, the wounds were randomized to receive either FTSC + bioactive peptide hydrogel (*carboxymethyl cellulose*), FTSC + scrambled peptide hydrogel, FTSC only or left untreated. Healing was monitored for up to 28 days and biopsies were collected on day 14. The wounds were excised and fixed in formalin for histologic analyses. In addition, non-invasive imaging systems were utilized to assess both wound healing and quality of healing.

Results: By day 14, the FTSC + bioactive peptide, FTSC + scrambled peptide, FTSC only and untreated wounds were 71 %, 55 %, 88 % and 27 % re-epithelialized respectively. The FTSC + bioactive peptide and the FTSC only treated wounds were significantly more re-epithelialized than the untreated wounds ($p < 0.05$). By day 28 all the FTSC transplanted wounds were fully re-epithelialized and the difference to the untreated wounds was statistically significant ($p < 0.05$). The results demonstrated that wound treated with the FTSC + bioactive peptide had more mature epidermis at day 28 post transplantation. The FTSC + bioactive peptide treated wounds had significantly more rete ridges and thicker epidermis in comparison to the other groups. In terms of wound contraction, no significant differences were observed.

Conclusions: This study demonstrated that FTSC can be transplanted in a hydrogel to close a full-thickness wound. Furthermore, it was shown that transplantation of FTSC in combination with bioactive peptides increased quality of wound healing.

Disclaimer: Research was conducted in compliance with Animal Welfare Act, the implementing Animal Welfare regulations, and the principles of the Guide for the Care and Use of Laboratory Animals. The Institutional Animal Care and Use Committee approved all research conducted in this study. The facility where this research was conducted is fully accredited by the AAALAC International. The views expressed in this abstract are those of the author(s) and do not reflect the official policy or position of the U.S. Army Medical Department, Department of the Army, DoD, or the U.S. Government.

Speaker

Kristo Nuutila
Principal Research Scientist
United States Army Institute of Surgical Research

8:45 AM

A Randomized Clinical Pilot Evaluating the Efficacy of Two Application Regimens of a Unique Keratin-based Graft in the Treatment of Non-Healing Diabetic Foot Ulcers

8:45 AM - 8:53 AM, Jan 30
Pikake I & II
Skin Substit…

Speaker

Charles Zelen
peri

8:53 AM

Multi-center, Randomized Controlled Clinical Investigation Evaluating a Unique Micro Water Jet Technology Device Versus Standard Debridement in the Treatment of Diabetic Foot Wounds

8:53 AM - 9:00 AM, Jan 30
Pikake I & II
Surgical

Background: Proper debridement of the wound base is critical to facilitate wound granulation and closure in non-healing diabetic foot ulcers(DFUs). A unique micro water jet device has been developed and recently granted breakthrough designation for treatment of DFUs by the Foot and Drug Administration(FDA) that precisely cleans acute and chronic wounds in a tissue-preserving manner while performing a precise mechanical cleaning and stimulation of the wound base to enhance granulation and healing.

Methods: 170 patients were screened, and 96 patients were enrolled for the analysis, in a two arm randomized controlled trial. DFUs that were non-healing for at least 4 weeks, with adequate blood flow and were void of clinical infection or osteomyelitis were entered into 2 weeks of screening. Those that met all the qualifications were randomized to receive either weekly micro jet wound debridement or standard sharp debridement along with SOC wound dressing and offloading. Both groups were followed for 16 weeks. The primary study endpoint was healing at 16 weeks and the secondary endpoints included a safety analysis.

Results: At 16 weeks 65%(28/43) of the Micro Water jet treated DFUs healed compared with 42%(22/53) treated with standard sharp debridement p=0.021 (unadjusted). Further, at 16 weeks, the safety analysis showed with regard to wound related adverse events (AE) and serious adverse events (SAE); 4 AEs and 1 SAE occurring in the Micro Water jet group versus 12 AEs and 4 SAEs in the standard sharp debridement group.

Conclusion: The micro water jet device was able to statistically significantly close more refractory DFUs over 16 weeks, without the need for any advanced biologic or graft. Further, the number of wound related infections and hospitalizations were 75% less in those patients treated in the Micro Water jet group. Further evaluation is warranted to validate these initial promising findings.

Speaker

Charles Zelen
peri

9:00 AM

Outcomes following simultaneous intense pulsed light and fractional CO2 laser resurfacing in hypertrophic burn scars

9:00 AM - 9:15 AM, Jan 30
Pikake I & II
Reconstructive/Pla…

Introduction

Hypertrophic burn scars present challenges for patients and clinicians. Intense Pulsed Light (IPL) and Ablative Fractional CO2 Lasers (AFCL) have shown promise in scar treatment by targeting vascular structures and promoting collagen production. While IPL-AFCL has been used in managing hypertrophic scarring in various dermatological conditions, limited data exist for burn scar treatment. In addition, scar vascularity can frequently limit the depth of penetration and density of AFCL yielding delayed results. The author's conducted a study asses sing the efficacy of simultaneous IPL-AFCL therapy on hypertrophic burn scars using the Modified Vancouver Scar Scale (MVSS). To the author's knowledge, this is the first reported case series of simultaneous laser treatment in the treatment of hypertrophic burn scars.

Methods

In this retrospective study (April 2021 to July 2023), data from patients (pediatric and adult) receiving at least two IPL-AFCL treatments were analyzed. Demographics, burn details, and complications were collected. Linear regression assessed the impact of time from burn to first treatment on MVSS scores. Unpaired t-tests compared pre/post-MVSS scores for partial-thickness (PT) and full-thickness (FT) burns, and paired t-tests evaluated pre/post-treatment MVSS score differences after IPL-AFCL treatment.

Results

The study involving 33 patients (11 PT burns, 22 FT burns), the mean pre-MVSS score was 12.09 ± 2.77, and post-MVSS score was 6.24 ± 2.96. IPL-AFCL significantly reduced MVSS scores by a mean of 5.85 ± 0.43 ($p< 0.0001$) with an average of 3.70 ± 1.69 IPL-AFCL treatments per patient. Significant reductions were also observed in pigmentation ($p=0.001$), vascularity, pliability, height, pain, and pruritus ($p< 0.0001$). Linear regression analysis showed that the duration from burn injury to the first laser treatment significantly influenced pre-MVSS scores ($p=0.008$) but not post-MVSS ($p=0.062$). No significant differences were found in pre-MVSS ($p=0.186$) and post-MVSS ($p=0.233$) scores between PT and FT burns. As for complications, 4/33 patients experienced blistering following treatment which did not result in any long-term consequences.

Conclusions

Our study demonstrated that IPL-AFCL treatment effectively improved hypertrophic burn scars. MVSS scores did not significantly differ between PT and FT burns, but the time from the initial burn to the first treatment significantly influenced pre-MVSS scores.

Applicability of Research to Practice

Simultaneous use of different light/laser modalities is safe and effective and may offer advantages with symptomatic, functional and cosmetic benefits.

Speaker

AJ Sood
Resident Physician
Summa Health

9:15 AM

Surgeon Meet Tailor: Exploring the Economic Impact of Absorptive Dressings and Optimizing Dressing Utilization

9:15 AM - 9:21 AM, Jan 30
Pikake I & II
Msc./Economy/Basic S…

BuilBurn and wound management is a critical aspect of healthcare, presenting both clinical and economic challenges. This podium presentation delves into the economic ramifications of absorptive dressings and emphasizes the potential benefits of optimizing dressing utilization, with a focus on absorbent, innovative and silver impregnated, large, absorbent textile solutions.

Burn and wound care costs represent a significant portion of healthcare expenditures, and the choice of dressings plays a pivotal role in determining these expenses. This presentation will analyze the economic implications of various dressing choices, highlighting the long-term savings and improved patient outcomes associated with absorptive dressings. Healthcare costs require purchasing commercially available products.

Utilization of this innovative technology can be tailored easily to save costs and optimize the dressings to the patient's wounds. This ensures that healthcare professionals make the most efficient use of dressings while maintaining the highest standards of patient care. The unique perspective on this issue will be presented, showcasing how advanced technologies and materials contribute to cost-effective wound management without compromising patient well-being. We will discuss best practices and strategies for minimizing dressing waste, enhancing dressing longevity, and maximizing their effectiveness.

By the end of this presentation, attendees will gain insights into the financial benefits of absorptive textiles and learn how to implement effective dressing utilization strategies. This knowledge can empower healthcare providers and administrators to make informed decisions that positively impact both patient outcomes and the economic sustainability of burn and wound care programs.

Speaker

Tracee Short
Burn Surgeon
Traumatic Skin Institute

9:21 AM

The Borders of Burns: A Geospatial and Population Analysis of Burn Center Coverage and Mortality

9:21 AM - 9:27 AM, Jan 30
Pikake I & II
Msc./Economy/Basic S…

Introduction: Burn injuries and mortalities represent a significant health challenge and burden on the healthcare system. With specialized burn centers (BC), that burden of care is lessened by focused resource provision in the hands of those who can deliver burn care most effectively. This study investigates burn mortality rates at the state level and burn center coverage within a given state, aiming to provide insights into public health planning and resource allocation.

Methods: A state-level ecological analysis was performed. Crude and age adjusted mortality and YPLL (years of potential life lost) rates were obtained from CDC WISQARS. Utilizing a novel dataset of state populations, state land area, and trauma and burn centers within each state, adult BC coverage was calculated by population (per million), and by area (per 100,000 mi^2). States missing mortality data were excluded from the analysis (n=6). Spearman's rank correlation was employed to determine relationships, given its robustness in non-parametric data without assuming linear correlations. Analysis was conducted using Python with libraries such as pandas and seaborn for data manipulation and visualization.

Results: Our analysis revealed a moderate negative association between BC coverage by population and mortality (crude: ρ= -0.31, p= 0.037; age-adjusted: ρ= -0.29, p= 0.051), indicating lower mortality in states with better per-capita burn center coverage. Analysis of mortality by BC land area coverage did not yield statistically significant findings nor did YPLL across the analyses performed.

Conclusion: The study suggests a potentially significant correlation between burn center density and burn related mortality at the state level, where greater coverage of burn centers was associated with lower mortality rates. The study has limitations based on data availability regarding burn injury prevalence at the state level, which would allow incidence and case-fatality-rate analysis and therefore a less confounded analysis of the potential protective effect of burn center coverage for mortality. Further insight into this relationship could be pivotal in guiding future public health strategies and resource allocation in burn injury management.

Speaker

Jonathan E. Schoen, MD, MPH, FACS
Clinical Assistant Professor of Surgery
LSUHSC School of Medicine New Orleans

9:27 AM

Single-Stage Coverage of Exposed Extensor Tendons with Intact Decellularized Fish Skin and Simultaneous Epidermal Autograft Application

9:27 AM - 9:33 AM, Jan 30
Pikake I & II
Skin Substit…

Introduction:

Coverage of exposed tendons in the upper extremity poses a challenging reconstructive problem, particularly in the absence of peritenon. In these cases, when local tissue is not available for coverage of the exposed tendon, skin substitutes are often used to provide a vascularized layer of soft tissue prior to application of an epidermal autograft. A disadvantage of this reconstructive technique is the additional time and additional surgery required between placement of the skin substitute and eventual skin graft to allow for revascularization of the wound bed to support the autograft. The authors present the first reported case of successful extensor forearm coverage with a single-stage intact decellularized fish skin graft with simultaneous lamination with split thickness skin autograft.

Case Report:

Patient is a 61-year-old female who presented with severe soft tissue injury to the left forearm from multiple dog bites. She underwent serial debridement of the wound resulting in a 150cm2 dorsal forearm wound with multiple exposed extensor tendons without intact peritenon. Initial soft tissue reconstruction was attempted in the traditional fashion with Integra® bilayer acellular dermal matrix (ADM). This healed well over the majority of the wound, however the ADM did not revascularize over the exposed tendons resulting in a persistent wound in this area. Six weeks after initial ADM placement she was brought back to the operating room and debridement was performed followed by placement of PriMatrix® dermal repair scaffold. This initially had good apposition to the wound bed, but eventually began to break down with resulting formation of a wound and exposed tendon.

She ultimately underwent debridement followed by placement of Keracis® meshed xenograft (fish skin) and simultaneous coverage with a thin split-thickness skin autograft covered by a wound VAC® bolster. The laminated coverage went on to heal without further intervention and the patient achieved coverage of the extensor tendons and improved wrist and finger extension.

Conclusion:

Reconstruction of exposed tendons in the upper extremity typically requires flap reconstruction or staged procedures to encourage development of healthy, vascularized tissue prior to application of a skin graft. The authors present the first case report known to date of simultaneous application of xenograft fish skin substitute and split thickness skin graft using the "sandwich" technique with successful coverage of exposed extensor tendons in the forearm. The meshed structure of the Keracis® decellularized fish skin allows for diffusion of nutrients within the wound bed through the xenograft to supply the overlying autograft while the presence of the skin substitute allows for healing of the skin graft over tendons devoid of peritenon. We believe this technique provides a useful single-stage reconstructive option for management of upper extremity soft tissue deficits requiring coverage of tendons and potentially other critical structures.

Speaker

Katherine Benedict
Resident
University of Mississippi

9:33 AM

Morning Break in Exhibit Hall

9:33 AM - 10:15 AM, Jan 30
General Meet…

10:15 AM

Surgical Reconstruction of Stage 3 and 4 Pressure Injuries with ECM Technology: A Proposed Algorithm

10:15 AM - 10:30 AM, Jan 30
Pikake I & II
Skin Substit…

Background: The burden of pressure injuries (PI) remains a substantial problem with over 1 in 10 adults patients admitted to hospitals affected with PIs (Bauer, Rock et al. 2016) . As of 2011 it was estimated that the cost of treating a stage IV PI and its related complications was $129,248. Additionally, the average 6 month post operative healing rates for a stage IV PI is 31-34% and the post operative complication rate after flap reconstruction is reported to be 58.7% (Bamba, Madden et al. 2017) . Approaches to the surgical closure of late-stage PIs are varied and suffer from relatively high complication rates. Additionally, while the utilization of advanced technologies, namely biologics and negative-pressure wound therapy (NPWT), is widespread there is no consistency in their deployment as part of the surgical intervention of late-stage PIs. The absence of a robust algorithm defining the surgical intervention of late-stage PIs led to the convening of an interdisciplinary panel to review the current state of the art and propose a treatment algorithm for the reconstructive and non-reconstructive intervention for late-stage PIs (Awad, Stern et al. 2023) . This abstract presents on-going research from the interdisciplinary panel, including the Surgical Algorithm and worked clinical case examples utilizing the algorithm along with a biologic graft as part of surgical reconstruction of these challenging soft tissue defects.

Methods: Development of the Surgical Algorithm has previously been reported (Awad, Stern et al. 2023) . Cases included herein to exemplify the algorithm included two patients who had undergone reconstructive closure (tissue flap-based closure) and two patients who had been managed with non-reconstructive closure (closed via secondary intention). All PIs were stage IV. Intervention proceeded according to the Surgical Algorithm. In each case a biologic graft comprising ovine forestomach matrix (OFM, Myriad Matrix, Aroa Biosurgery Limited, New Zealand) was included as part of the surgical intervention. Closed incision NPWT or traditional NPWT were used for the reconstructive and non-reconstructive cases, respectively. Patients were followed till closure and monitored for complications such as surgical wound dehiscence, hematoma, seroma, flap necrosis or infection.

Results: The Surgical Algorithm previously developed by the interdisciplinary panel has been put into practice across several US institutions. In the four cases included here-in to exemplify the approach all patients healed, with no post operative complications.

Conclusion: A reproducible surgical algorithm utilizing advanced biologic technology, such as OFM, may assist in the accelerated healing of PIs and lower the post-operative complication rates. Further studies are on-going across the interdisciplinary panel to validate the inclusion of OFM-based graft in the surgical algorithm for late-stage PIs.

References: Awad, S. S., J. D. Stern, C. T. Milne, S. G. Dowling, R. Sotomayor, E. A. Ayello, L. J. Feo Aguirre, B. Z. Khalaf, L. J. Gould, M. N. Desvigne and A. E. Chaffin (2023). "Surgical Reconstruction of Stage 3 and 4 Pressure Injuries: A Literature Review and Proposed Algorithm from an Interprofessional Working Group." Advances in Skin & Wound Care **36**(5): 249-258.

Bamba, R., J. J. Madden, A. N. Hoffman, J. S. Kim, W. P. Thayer, L. B. Nanney and M. E. Spear (2017). "Flap Reconstruction for Pressure Ulcers: An Outcomes Analysis." Plast Reconstr Surg Glob Open **5**(1): e1187.

Bauer, K., K. Rock, M. Nazzal, O. Jones and W. Qu (2016). "Pressure Ulcers in the United States' Inpatient Population From 2008 to 2012: Results of a Retrospective Nationwide Study." Ostomy Wound Manage **62**(11): 30-38.

Speaker

Abigail Chaffin MD, FACS, CWSP, MAPWCA
Professor of Surgery and Chief, Section of Plastic Surgery. Program Director - Tulane University/Ochsner Clinic Plastic Surgery Residency Program
Tulane University

10:30 AM

Ovine Forestomach Matrix in the Surgical Management of Complex Volumetric Soft Tissue Defects: A Retrospective Case Series

10:30 AM - 10:45 AM, Jan 30
Pikake I & II
Skin Substit…

Purpose: Volumetric soft tissue loss is an urgent surgical issue and can frequently lead to suboptimal outcomes for patients due to significant soft tissue loss, compromised vital structures (e.g., viscera, tendons, neurovascular structures), and contamination (Guest, Fuller, and Vowden 2018). Ovine forestomach matrix (OFM) has demonstrated clinical success in the surgical management of acute and chronic soft tissue defects, especially in contaminated fields providing a clinically effective option for the immediate coverage of exposed vital structures prior to definitive closure (Bohn and Chaffin 2020). This retrospective case series (n=13 defects) evaluated the clinical effectiveness of OFM (graft and/or particulate formats) in the surgical management of contaminated volumetric soft tissue defects resulting from necrotizing soft tissue infection, motor vehicle accidents, pressure injuries, trauma and surgical dehiscence.

Method: The IRB-approved retrospective study included patients that had undergone surgical reconstruction during the period January 2021 to November 2022 at a single facility. Patient demographics (e.g., age, gender, significant baseline comorbidities), defect etiology and characteristics (e.g., size, CDC grade), and outcomes (e.g., 100% granulation tissue formation, recurrence, complications) were captured. The primary study outcome was defined as time (days) for complete graft integration and volumetric fill of the soft tissue defect. Secondary endpoints included post-operative complications (e.g., infection, pain, and recurrence). Descriptive statistics (e.g., median, mean, standard deviation (SD)) were calculated.

Results: There was a total of thirteen (13) volumetric soft tissue defects across ten (10) patients that underwent surgical reconstruction. The mean defect age was 3.8±5.6 weeks and mean size was 217.3±77.9 cm^2. Most defects had exposed structures (85%) and all defects were CDC grade 2, or higher. The mean time to 100% granulation tissue formation was 24.1±9.3 days, with a median product application of 1.0. Staged reconstruction was used in n=7/13 defects, with the remainder (n=6/13) left to heal via secondary intention using standard wound care. There were no major post-operative complications to a median follow-up of 8.0±1.7 weeks.

Conclusion: The findings of this case series suggest the clinical efficacy of OFM in the surgical reconstruction of volumetric soft tissue defects. These data suggest that OFM can potentially shorten the time to final closure, limit surgical complications, and provide volumetric contour restoration and functional tissue regeneration.

References:

Bohn, G. A., and A. E. Chaffin. 2020. 'Extracellular matrix graft for reconstruction over exposed structures: a pilot case series', *J Wound Care*, 29: 742-49.

Guest, J. F., G. W. Fuller, and P. Vowden. 2018. 'Costs and outcomes in evaluating management of unhealed surgical wounds in the community in clinical practice in the UK: a cohort study', *BMJ Open*, 8: e022591.

Speaker

Michael Cormican

10:45 AM

Factors Effecting Burn OR Turnover

10:45 AM - 11:00 AM, Jan 30
Pikake I & II
Msc./Economy/Basic S…

Background: Maximizing the efficiency of opera4ng room (OR) turnover 4me, measured as the interval between a pa4ent leaving the OR and the subsequent pa4ent entering, is essen4al for increasing OR produc4vity and providing cost-effec4ve pa4ent care, thus highligh4ng the need to iden4fy variables that can contribute to prolonged nonopera4ve 4me. Data suggests that scheduling consecu4ve cases with the same OR team and increasing communica4on between team members can maximize efficiency, and established strategies addressing these underlying issues exist to help streamline nonopera4ve 4me. However, there is insufficient data on the impact of pa4ent-specific variables and case complexity on turnover and other nonopera4ve 4mes: here, we aim to iden4fy factors associated with these measures for burn pa4ents undergoing procedures in a dedicated burn OR.

Methods: We conducted a retrospec4ve study on pa4ent factors affec4ng opera4ng room turnover 4mes in burn pa4ents at a large academic regional burn center. Relevant 4mestamps, including 4me in/out of room and procedure start/stop, were pulled from OR case logs. We conducted chart review for total body surface area (TBSA) burned, pa4ent posi4on in the OR, and airway upon arrival to the OR. We analyzed pa4ent factors' impact on turnover 4me, 4me from pa4ent arrival to the room to surgery start (induc4on 4me), and 4me to exi4ng the room from surgery end (exit 4me) using one way ANOVA analysis. Finally, turnover 4mes were compared between other surgical special4es.

Results: Over a one-year period, data from 241 cases with 128 unique pa4ents was collected, reviewed, and analyzed. The mean TBSA (%) and number of procedures per pa4ent were 10.93 ± 1.22 and 1.89 ± 0.098 respec4vely. Supine was the most common opera4ve posi4on (n = 191, 78.93%) with prone (n = 28, 11.57%), lateral (n = 4, 1.65%), and prone to supine (n = 16, 6.61%) being less common. Higher TBSA was linearly associated with an increase in both turnover 4me ($p < 0.0001$) (Figure 1) and induc4on 4me ($p < 0.0001$) (Figure 2). Pa4ents intubated upon arrival to the OR were also associated with significantly longer turnover 4mes ($p < 0.0001$). Finally, posi4ons other than supine were associated with significantly longer induc4on 4me ($p < 0.0001$) (Figure 3) but not exit 4me ($p = 0.50$). Compared to other surgical special4es, mean burn specific turnover 4me (min) was 42.10 ± 1.38 compared to 34.43 ± 0.83 for general surgery, 59.61 ± 1.74 for neurosurgery, 40.85 ± 0.99 for orthopedics, and 44.84 ± 1.54 for urology.

Conclusion: Larger TBSA, posi4ons other than supine, and intuba4on status upon arrival to the OR were associated with longer turnover and induc4on 4me. Pa4ent factors can be considered in OR block scheduling to increase accuracy and efficiency. TBSA and pa4ent posi4on's effect on induc4on 4me can be useful informa4on for surgeons.

Speaker

Michael Paolini
UPMC

11:00 AM

CCO mitigates burn progression

11:00 AM - 11:15 AM, Jan 30

Pikake I & II

Msc./Economy/Basic S…

Introduction: Prevention of burn conversion, progression beyond the initial injury via necrosis from the zone of coagulation to the zone of stasis, is of vital importance in clinical practice. Progressing thermal injury of the skin is influenced by permeability of the epithelium and subsequent prolonged inflammatory responses. Recent studies suggest debridement via Clostridium collagenase modulates a cellular response to foster a pro-reparative and decrease in pro-inflammatory macrophage polarization allowing a more coordinated healing response. To understand its role in burn wounds, we evaluated Clostridium collagenase's ability to minimize secondary necrosis and its impact on the inflammatory response to the tissues surrounding burn injury.

Methods: A porcine burn comb model was used to create deep-partial thickness burns on Yorkshire-cross pigs. Immediately post injury and then daily, wounds were treated with collagenase or vehicle hydrogel. Burn interspaces represented the zone of stasis. Punch biopsies were collected from the burn interstices, fixed, and prepared for histological and immunohistochemical analyses. In addition, an observational case series was documented over time.

Results: Collagenase treatment showed an early epidermal separation/loss that coincided with maintained fibrillary collagen structure and significantly reduced necrosis ($P<0.001$) and apoptosis ($P<0.01$). Collagenase treatment also showed a significant ($P<0.05$) advantage for preservation of hair follicles and blood vessels. A dynamic immunomodulatory response to burn injury with advantageous influx/efflux of neutrophils ($P<0.05$) and macrophage response was observed for collagenase-treated burns. By day 4, collagenase treatment diminished M1 phenotype in parallel to significant ($P<0.05$) M2 phenotype influx indicating transition out of the pro-inflammatory and into a pro-reparative response. Observational findings show CCO mitigation of burn progression in partial-thickness burn patients.

Discussion: Clostridium collagenase debridement led to early dermal separation that effectuated a limit of necrosis, preservation of vasculature, and early influx/efflux of the inflammatory process beneficial to preventing burn conversion. Our findings suggest application of collagenase has the advantage in early stages following burn injury in preventing continued damage due to the process of necrosis that often leads to a significant delay in healing.

Speaker

Rajiv Sood
Chief of Plastic Surgery and Burn Reconstruction
JMS burn center

11:15 AM

Glabrous Palmar Grafting

11:15 AM - 11:30 AM, Jan 30

Pikake I & II

Surgical

A 3-year-old Black boy was caught in his parents' treadmill for a few moments and presented with an abrasion of the right hand to our burn center shortly thereafter. He was treated conservatively with local wound care for several days, but it soon became apparent that this abrasion resulted in full thickness palmar and ventral thumb injuries and would not heal without debridement and grafting. As we were concerned about pigment mismatch and the durability of his skin, and had but a small area to graft, we elected to use the hypothenar eminence of his palm as a donor for the remaining full thickness abrasion. With informed consent from his parents, we proceeded to the OR where under tourniquet his wound was debrided with a Goulian knife to viable deep dermis and in places palmar pulp. Next, we harvested a strip of skin from the hypothenar eminence to mid-dermis using the same Goulian knife. Once hemostasis had been established the donor was then divided between the ventral aspect of the thumb and palm and sewn in place, and the hand was then bolstered and splinted. The graft was revealed on postoperative day 5 and appeared quite viable. Healing progressed and within 20 days both graft and donor were healed with excellent color match and only modest scaring. The patient was followed for the next year and developed a mild flexion contracture of the thumb due to splint noncompliance amenable to a single z-plasty.

While most full thickness injuries to the ventral fingers and palm are treated with full thickness skin grafting, propeller flaps, or other complex means, at times simple glabrous skin harvest and grafting can be used to advantage. These grafts have the advantages of ease of harvest, are a good color match, wear like the original skin, have none of the typical donor site complications associated with flaps or full thickness donor sites, are not prone to epidermolysis and are more aesthetically pleasing than full thickness skin grafts, especially in more pigmented individuals. Use of the non-injured portions of glabrous skin on the injured hand (or foot) when feasible, eliminates the morbidity associated with remotely harvested sites. There are scant few papers in the medical literature discussing glabrous skin grafting. While rarely discussed, and seldom written about, glabrous skin for palmar (and plantar) grafting has some unique advantages over other often more complicated solutions and should be in the lexicon of all burn, plastic, and hand surgeons.

Speaker

Gary Vercruysse
Director of Emergency General Surgery
University of Michigan

11:30 AM

The Use of a Novel Antimicrobial Matrix That Promotes Human Cell Growth in Conjunction With Epidermal Autografts

11:30 AM - 11:36 AM, Jan 30

Pikake I & II

Technolo…

Bacterial control and keratinocyte growth are essential components of burn wound closure. Attempts to decrease wound bioburden with debridement and topical antimicrobials is not always effective as residual microbes can regrow in as little as 5 minutes, and reform biofilm with 24 hours. Commonly used silver containing compounds are antimicrobial but can impair wound healing. A potential solution is the use of a synthetic, ultrathin, resorbable wound matrix that not only decreases wound bioburden with nanoparticles of silver, but also promotes cell migration. The matrix has been used safely and effectively on burn patients and in conjunctions with complex biologics, skin grafts, and donor sites.

Epidermal autografts can also facilitate burn wound closure and reduce donor site size, but there has been minimal experience with epidermal autografts in conjunction with a resorbable antimicrobial matrix. This report details our initial experience with this combination technique.

A variety of patients have now been treated with both the antimicrobial matrix and epidermal autografts. All patients had 2:1 mesh autografts oversprayed with epidermal autografts and immediately covered by the resorbable antimicrobial matrix. Donor sites were treated in a similar fashion. A nonadherent layer, bismuth impregnated gauze and outer dressing was used in all and changed per previously published protocols. All had 100% graft take and accelerated donor site closure consistent with previous reports.

The antimicrobial resorbable matrix could be an ideal adjunct for epidermal autograft use in complex skin grafting cases and is an important adjunct for the burn surgeon managing a wide variety of complex wounds.

Speaker

Michael Schurr
Chair, Department of Surgery
MAHEC

11:36 AM

Successful Soft Tissue Reconstruction Utilizing Acellular Fish Skin Grafts in a Delayed Ukrainian War

11:36 AM - 11:42 AM, Jan 30

Pikake I & II

Skin Substit…

Abstract:

Blast wounds significantly contribute to injuries sustained by military personnel and civilians, with nearly 10,000 US occurrences reported from fireworks in 20141. Briefly, blast wounds are categorized as primary (pressure), secondary (fragments), tertiary (structural collapse), and quaternary (thermal)2. Secondary blast wounds account for most blast wounds to military service persons and are often fatal and associated with severe tissue involvment2. There is debate on the temporal nature of contending with soft tissue damage from secondary blast wounds but an agreement that early and frequent debridement is critical3. Outside of trauma-related injuries, the surgeon is often faced with severe tissue loss, which is often highly contaminated and requires the application of novel strategies3. Fish skin graft (FSG) has been tested and considered for battlefield blast wounds with the implications of providing a bacterial barrier and rapid cellular ingrowth4. Therefore, this case aims to evaluate FSG in a secondary blast wound. Methods A 37-year-old American ER nurse on a humanitarian mission in Bakhmut, Ukraine, sustained significant soft tissue blast injuries from a close-range Russian missile attack on February 2, 2023. The patient was thrown 30 feet from impact, sustaining shrapnel injuries to her right lower extremity, buttock, and flank. She additionally sustained bilateral tympanic membrane rupture and a peroneal nerve injury. The patient was admitted to a frontline Ukrainian Military hospital where superficial shrapnel was extracted from her leg wounds and cleansed. Three days later, the patient was presented with a temperature of 104 F and treated with oral antibiotics. A week later, she underwent diagnostic testing in a US emergency room to rule out vascular orthopedic or intraperitoneal injuries. She presented to our wound care center three days after arrival to the US with necrosis and low-grade cellulitis of her wounds. She was admitted to the hospital for IV antibiotics, and operative debridement was performed the following day. On POD#2, the wound cultures were finalized to Coag neg Staph, and fish skin grafts were applied at the bedside in conjunction with negative pressure wound therapy. Results She has been followed weekly in our wound care center with an excellent clinical response. It is anticipated that her wounds will heal without further surgical intervention. Discussion Blast wounds have several mechanisms to create injury and are accompanied by challenging pathophysiology1. Beyond the traumatic injuries, blast injuries severely damage soft tissues in ways that often extend beyond ordinary wound care. FSG has been considered for battlefield wounds and provided our patient with a viable option for managing her blast wound injury. More significant studies should evaluate FSG for the treatment of blast wounds. References 1. Jorolemon, M. R., Lopez, R. A., & Krywko, D. M. (2022). Blast Injuries. In StatPearls. StatPearls Publishing. 2. Plurad, D. S. (2011). Blast injury. Military medicine, 176(3), 276-282. 3. Sheean, A. J., Tintle, S. M., & Rhee, P. C. (2015). Soft tissue and wound management of blast injuries. Current reviews in musculoskeletal medicine, 8, 265-271. 4. Magnusson, S., Baldursson, B. T., Kjartansson, H., Rolfsson, O., & Sigurjonsson, G. F. (2017). Regenerative and antibacterial properties of acellular fish skin grafts and human amnion/chorion membrane: implications for tissue preservation in combat casualty care. Military Medicine, 182(suppl_1), 383-388.

Disclaimer:

Learning Objectives

1. Blast wounds have several mechanisms to create injury and are accompanied by challenging pathophysiology1. Beyond the traumatic injuries, blast injuries severely damage soft tissues in ways that often extend beyond ordinary wound care.
2. FSG has been considered for battlefield wounds and provided our patient with a viable option for managing her blast wound injury.
3. More significant studies should evaluate FSG for the treatment of blast wounds.

Speaker

Mark Suski
Plastic Surgeon/Medical Director
Los Robles Medical Center

11:42 AM

Reducing Bioburden and Disrupting Hard to Remove Microbial Colonies with Pure Hypochlorous Acid (pHA)* in a Necrotic Wound On the Surface of an Implanted Device

11:42 AM - 11:48 AM, Jan 30

Pikake I & II

Topical Treatm…

Introduction:

Presence of bacterial colonies that are adherent to the tissue surface are recognized as deterrents to wound healing.

If an implant is involved in the wound area, and bacteria enter and proliferate/colonize the implant, the risk to the patient is highly magnified.

Wound cleansers that efficiently remove germ and germ secreted matter such as polysaccharides and proteins (in common parlance, bacterial slime), may lead to notable outcomes against all expectations.

A pure Hypochlorous Acid (HOCl) based cleanser*, evidence shows, is able to remove bacteria, associated slime like materials, and necrotic tissue that are all usually associated with problem wounds.

Case Details

79 yo female s/p percutaneous aortic valve repair complicated by bleed and hematoma in right groin at the valve insertion site, resulting in full thickness necrosis.

Medical history: Aortic valve stenosis, CHF, HTN, Obesity

Treatment:

Patient not deemed a primary closure surgical candidate upon presentation.

NPWT instillation with dwell time* initiated with 3M™ Veraflo™ Cleanse Choice™ Dressing with pHA cleanser, at the bedside, to soften and degrade necrotic tissue.

Taken to OR for staged debridements.

pHA (HOCl) cleanser used always for irrigation during every opportunity in this treatment phase, applied via soaked gauze.

Definitive closure performed with reticular dermal matrix*** placed as tissue scaffolding for soft tissue replacement.

Placental allograft**** placed to optimize healing, followed by incisional primary closure of defect

Incisional NPWT Therapy initiated following closure

Incisional wound dehisced during stay at stepdown facility

The dehisced wound was cleansed regularly with HOCl cleanser, via soaked gauze, then closed primaily via sutures when the wound bed was deemed ready

Results:

As there was an episode of dehiscence, there were two primary closures on the way to healing for this patient.

Following both closures, there was no evidence of residual or recurrent infection at the wound site. More importantly, following a delay in healing there was no evidence of bacterial seeding of her recently implanted aortic heart valve.

Conclusion:

HOCl use seems to be quite compatible with the use of biological matrices used to promote wound healing such as human dermal matrix and amniotic materials.

We believe there may be a role for HOCl to remove biorburden, necrotic tissue, and associated debris to lead to infection free wound healing in highly complex wounds/patients.

Implanted devices are highly prone to bacterial seeding and the development of life threatening internal infections. The use of pHA/HOCl based cleanser seem to have significantly mitigated this risk for this patient.

Speaker

Michael N. Desvigne
Plastic Surgeon
Abrazo Arrowhead Hospital

11:48 AM

Quantitative analysis of dermal regeneration template use for management of burns: a 14 year analysis of National Burn Repository

11:48 AM - 11:54 AM, Jan 30

Pikake I & II

Skin Substit…

Introduction: Thermal burn injuries comprise of over 400,000 emergency room visits in the United States each year, with estimated costs of care being over $1 billion. Dermal regeneration template continues to be the only skin substitute on the market indicated for the management of third degree burns. Since its introduction over 25 years ago, over 75 unique commercially synthetic and non-autologous tissue substitute products are available today. Many of these technologies have been used for patients where sufficient autograft was not available due to their physiological condition. The goal of this study was to elucidate how Integra's dermal regeneration template has been used over the last 14 years and aim to understand where it has the most utility in the burn community.

Methods: National Burn Registry data from 2008-2021 were analyzed (n = 388,775 patients). Surviving patients treated with dermal regeneration template were specifically identified in 'Resource Utilization' of the dataset (n = 528 patients with dermal regeneration template alone). Aggregated metrics included patient demographic information (age, sex, comorbidities, burn location/area) and outcome measurements (LOS, total body surface area (TBSA) (2^{nd}, 3^{rd}, and combined), complications, resources, number of procedures, number of excisional and non-excisional debridements). Additional analyses included normalizing patients' LOS per TBSA.

Results, Discussion, and Conclusion: Preliminary analysis showed patients with a majority third-degree burn 40-59% TBSA and >60% TBSA and treated with dermal regeneration template were associated LOS/TBSA of approximately 1.53 ± 0.74 and 1.06 ± 0.60, respectively. Previous studies have shown significant limitations and overestimation of the traditional rule-of-thumb of LOS/TBSA near 1, including confounding variables such as patient age, complications, inhalation injury, depth of burn, and large TBSA burns. This study demonstrates the utility of National Burn Repository / real world evidence to study a burn care algorithm (use of dermal regeneration template) and the specific impact on clinical performance. Future analysis will investigate this patient cohort to further understand the clinical and health economic implications.

Speaker

Roselle Crombie
Surgeon, Faculty
Yale New Haven Health

11:54 AM

Dehydrated Human Amnion Chorion Membrane (DHACM) Use in Patients with Emergent Craniectomies Demonstrates Minimal Dural Adhesions at Time of Cranioplasty

11:54 AM - 12:00 PM, Jan 30
Pikake I & II
Skin Substit…

Aim: To evaluate whether dehydrated human amnion chorion membrane (DHACM) used in emergent decompressive craniectomies (DC) decreased the rate of dural adhesion formation and subsequent cranioplasty (CP) complications.

Method: Retrospectively analyzed patients undergoing an emergent DC for a traumatic brain injury or malignant edema secondary to a cerebral infarction of the middle cerebral artery (MCA) where either group received DHACM anti-adhesion protocol. Primary objective was to qualitatively evaluate adhesion formation in patients who received intraoperative DHACM interlay/overlay (Figure 1).

Results / Discussion: Of the seven patients, five (71%) had undergone emergent decompression due to SDH secondary to traumatic injury while the additional two patients (29%) had right MCA infarctions resulting in malignant edema and large midline shift. The average age of patients was 43 years (+/- 8.6 CI: 95%) with a range of 28 to 63 years old. Five of the seven patients were male (71%). The mean CP procedure time was 79.2 minutes. Time to replacement of autologous bone flap or implant ranged from 36 to 176 days (1-5 months) across the seven patients. When looking at mechanism of injury, those categorized as traumatic SDH had 99.4 days delay prior to CP while those with right MCA infarcts waited on average 140.5 days prior to CP. Table 1 outlines patient demographics, locations and mechanism of injury, blood loss and overall time from primary DC to CP in days. Qualitative assessment of the degree of adhesions at time of cranioplasty revealed minimal restrictions or increased effort required secondary to dural fibrosis. 86% (6/7) of patients demonstrated no adhesions at the time of the obligatory secondary CP. One (14%) of the seven patients was found to have significant adhesions formed, yet perioperative notes did not show evidence of complications in dissection in this patient. Due to the small patient population, it cannot be determined the relationship between fibrosis of the dura mater and time delay between repairs. Secondary metrics including time dedicated to dissection, estimated blood loss (EBL), and post-surgical complication were assessed using all hospital, clinic, or telehealth reports made at time of cranioplasty or during follow-up. Estimated time spent dissecting and exposing skull defect during the CP prior to implantations was under 3 minutes per operative report and neurosurgeon self-assessment. Estimated blood loss was minimal ranging from 50-100 mLs with an average of 64.2 mLs. Post-operative repair complications were minimal in the immediate interval; however, one patient did require redocranioplasty secondary to acute fluid collection inducing midline shift after initial repair.

Conclusion: DHACM is a biologic tissue which has been safely used in a wide variety of surgical settings. Its potential as a physical barrier which can aid in supporting an intracranial environment that can ameliorate reactive fibrosis in decompressive craniectomy patients is promising. Further research with larger patient volume and controls arms would be invaluable in determining the full therapeutic effect compared to current anti-adhesion protocols.

Speaker

William Tettelbach
Chief Medical Officer, Adjunct Assistant Professor
RestorixHealth, Duke University School of Medicine

12:30 PM

Lunch Symposium - Smith+Nephew: Laying the Foundation Discussion and case presentation: A strategic approach to debridement as the foundation for burn wound management

12:30 PM - 1:30 PM, Jan 30
Puakenikeni Room
General Meet…

Objectives:

- Discuss debridement as the foundation for burn care
- Compare various debridement methods
- Recognize the importance of hydrosurgical debridement as an essential intervention in complex burn wound management

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Speaker

Rajiv Sood
Chief of Plastic Surgery and Burn Reconstruction
JMS burn center

2:00 PM

Kerecis Event: Taste of Iceland

2:00 PM - 4:00 PM, Jan 30
Kapa Pool

Join Kerecis for an informative and fun 'Taste of Iceland' event at the Kapa Pool.

Wed, Jan 31, 2024

6:30 AM

Breakfast Symposium: Access Pro Medical: MatriDerm – World Leading Collagen-Elastin Acellular Dermal Matrix for Burn Care and Soft Tissue Injuries

6:30 AM - 7:30 AM, Jan 31
Puakenikeni Room
General Meet…

Dr. Dantzer will describe the basics of MatriDerm and share insights from his vast experience and knowledge for those who may be new to the product. Dr. Olaveson will present on what he has learned from using MatriDerm over the past two years and how his use is continuing to evolve.

Speakers

Tait Olaveson
Eastern Idaho Regional Medical Center

Eric Dantzer
Senior Plastic Surgeon
Instruction Military Hospital Sainte Anne

7:00 AM

Continental Breakfast

7:00 AM - 8:00 AM, Jan 31
Exhibit Hall
General Meet…

7:45 AM

Creation of an Instrument for Determining Burn Surgeon Wellness

7:45 AM - 8:00 AM, Jan 31
Pikake I & II
Msc./Economy/Basic S…

INTRODUCTION

Studies show that a substantial proportion of surgeons experience burnout. A career in burn surgery, meanwhile, has been associated with long hours, hot operating rooms, compassion fatigue, and possible health conditions. No current studies have benchmarked burn surgeon wellness as compared to their peers. The goal of our study is to assess burn surgeons relative to other professions to better understand the time, intensity, and complexity of a career in burn surgery, and possible health conditions.

METHODS

We conducted a review of available literature on PubMed, EMBASE, and MEDLINE. Articles were included if they were published in English, between 1990-2023, and evaluated surgeon wellness. Keywords used included: workforce, surgeon, burnout, health, wellness. Papers with benchmarked survey tools were assessed, and a review was performed by a panel of burn surgeon experts which will be referenced in our future work.

RESULTS

12 articles were identified. Perceived burnout was mainly characterized by age, sex, years in practice, and hours worked per week. A multitude of studies have described work-related musculoskeletal complaints in surgeons; however, we only found one study on the effects of a hot operating room on surgical staff, which indicated significant dehydration in staff. Increased intra-operative stress was shown to increase risks of heat-related illnesses, as well as cardiac and respiratory complications, and the surgeons' mental and technical abilities. Of note, women's health was excluded from all studies.

DISCUSSION

As the U.S. is facing an increasingly alarming surgeon shortage; it is crucial that burn surgeons are retained in the field, which requires a better understanding of stressors and health related outcomes. Burn surgeons are exposed to sharps, long work hours, bodily fluids, intense heat related work conditions, and thus may suffer health complications. Occupational hazards pose serious, yet unaccounted for, threats to burn surgeon health. Hot environmental conditions may impair manual dexterity, cause a loss in body mass, and dehydration. In a discussion with a panel of burn surgeon experts, we have formulated a survey using benchmarked resources to account for occupational hazards and women's health, in addition to characterizing burnout.

CONCLUSION

Burn surgeons report high satisfaction rates in their career; however, gaps in literature remain. Our formulated survey combines benchmarked data points as well as focus towards women's health and burn surgery related work conditions. Future studies should focus on the outcomes of the time, intensity, and complexity, of a career in burn surgery.

Speaker

Anastasiya Ivanko
Research Associate
University Medical Center (LSU Health)

8:00 AM

Use of Urinary Bladder Matrix in traumatic wounds and necrotizing soft tissue infections

8:00 AM - 8:15 AM, Jan 31
Pikake I & II
Skin Substit…

The management of large soft tissue defects regardless of cause remains challenging . Available strategies to facilitate granulation tissue formation and ultimate closure have changed over the past year . Cases will be presented to demonstrate use of urinary bladder matrix to achieve a superior wound bed and decrease the number of operations and time to closure .

Speaker

Juvonda Hodge
Medical Director
University of Mississippi Medical Center

8:15 AM

A novel thermo-reversible sprayable hydrogel for burn wounds

8:15 AM - 8:30 AM, Jan 31
Pikake I & II
Topical Treatm…

Speaker

Gregory Schultz
Professor Emeritus
University of Florida

8:30 AM

A novel approach to treating a deep hand and foot burn with enzymatic debridement followed by application of an autologous skin cell suspension resulting in early epithelialization and high cosmetic results.

8:30 AM - 8:45 AM, Jan 31
Pikake I & II
Skin Substit…

AIM: To demonstrate a novel approach to wound closure, involving the upper and lower extremities, utilizing a topical concentrate of proteolytic enzymes followed by the application of an autologous skin cell suspension.

INTRODUCTION: Burns of the hands and feet are relatively common and, if not treated appropriately, can result in hypertrophic scars and scar contractures that cause significant functional and cosmetic problems. In addition, the palms and soles are areas that are more prone to epithelialization, while if skin grafting is required, the conventional split skin graft leaves inconveniences. We have treated a mixture of full thickness burns on the palms of adults and deep dermal burns on the feet of two infants. These burns were treated with both enzymatic debridement and autologous dermal cell suspensions with very good functional and cosmetic results. The combination of both treatments is considered a novel approach for such patients.

CASES:

Case 1: A 28-year-old man suffered a contact burn on his right palm. The depth of the burn was determined to be a mixture of deep dermal burn and deep burn with a TBSA of 0.5%. enzymatic debridement with a topical concentrate of proteolytic enzymes derived from pineapple stems and enriched in bromelain (NexoBrid, MediWound, Yavne, Israel) was performed on burn day 9（treatment day 1: Day1）. On burn day 11, an autologous skin cell suspension harvested from the hypothenar area, using a proprietary device (RECELL System, Avita Medical. Inc. California, USA), was applied to the debrided wound (Day 3). Nine days after the autologous skin cell suspension application, complete epithelialization of the right palm burn wound and good cosmetic results were observed (Day 12)（Figure 1).

Case 2: A 9-month-old male suffered a full-thickness scalding burn on his foot. The depth of the burn was determined to be a mixture of deep dermal and deep dermal with a TBSA of 1.5 %. Enzymatic debridement was performed using a topical concentrate of proteolytic enzymes derived from pineapple stems and enriched in bromelain on burn day 7 (Day 1). On burn day 10, an autologous skin cell suspension harvested, using a proprietary device, from the hairline behind the ear was applied to the debrided wound (Day 4). Ten days after the autologous skin cell suspension application, complete epithelialization of the full-thickness foot burn wound, and good cosmetic results were observed (Day 14) (Figure 2).

Case 3: One year and one month old male, suffered a scalding burn on the medial side of the foot. The depth of the burn was determined to be a deep dermal burn with a TBSA of 1 %. Enzymatic debridement was performed using a topical concentrate of proteolytic enzymes derived from pineapple stems and enriched in bromelain on burn day 6 (Day 1). On burn day 7, an autologous skin cell suspension harvested, using a proprietary device, from the hairline behind the ear was applied to the debrided wound (Day 1). Eight days after the autologous skin cell suspension application, complete epithelialization of the medial side of the foot burn wound and good cosmetic results were observed (Day 10) (Figure 3).

Conclusion: The presented case reports highlight how the combination enzymatic debridement using a gel concentrate of proteolytic enzymes enriched in bromelain followed by the application of an autologous skin cell suspension can avoid surgical debridement while achieving expedited epithelialization while potentially reducing the risk of hypertrophic scarring, contracture, and providing good cosmetic results. Further long-term observation beyond the 31-day follow-up highlighted in the first case is needed to determine if contracture will occur in the future.

Speaker

Hajime Matsumura
Professor in Chief
Department of Plastic and Reconstructive Surgery, Tokyo Medical University, Tokyo JAPAN

8:45 AM

Pandemic Era Leg Reconstruction and Limb Salvage Without the Use of Free Tissue Transfer

8:45 AM - 9:00 AM, Jan 31

Pikake I & II

Surgical

Background: The COVID-19 pandemic created a unique set of direct challenges to healthcare such as limitations in operating room availability and resources, as well as secondary challenges such as lack of skilled personnel for surgery and post-operative care. Despite no significant reduction in lower extremity trauma and malignancy, these pandemic era challenges had specific implications in the community setting that impacted methods of leg reconstruction and limb salvage in our practice, which were previously treated by readily available microsurgery and free tissue transfer.

Methods: A consecutive series of leg reconstruction and limb salvage patients is presented demonstrating comprehensive reconstruction and wound closure of the leg, from knee to foot, with traditional and unique autologous flaps, grafts and hybrid procedures without the use of microsurgery and free tissue transfer.

Results: Twelve consecutive patients with 15 unique leg wounds (2 upper third, 3 middle third, 10 lower third) are presented. Twenty-five procedures were performed. Five patients required more than one procedure to achieve wound closure. One patient required debridement in the office. Two patients required two procedures either due to planned staging or unexpected return to the operating room. One patient required three procedures, but presented in follow-up with new unrelated pressure ulcers. One patient required eight procedures. Five of the twelve patients had a complication requiring intervention. Infection requiring antibiotics was seen in two patients. Partial flap loss was seen in three patients. New unrelated pressure ulcers were seen in one patient. Complications in the patient requiring eight procedures included infection, partial flap loss and two failed dermal repair matrices. All wounds went on to closure without amputation.

Discussion: Within the United States, the availability of microsurgery and free tissue transfer has yielded a seemingly indispensable tool for limb salvage. However, this tool is a luxury that is afforded by availability of resources in developed countries. Microsurgery and free tissue transfer require special equipment, teams, and supplies which are not typically limited in the United States. In most circumstances these are challenges thought to be problems most often experienced in developing countries. These types of challenges in the United States have been limited and most frequently encountered only in conjunction with disasters such as Hurricane Katrina or events like the COVID-19 pandemic. In these instances, deviation from “standard practices” may be required to meet patient needs. In some instances, patient volume or needs may even increase due to the surrounding circumstances. An unintended consequence of reliance on advanced techniques that are dependent on specialized resources such as advanced equipment is the loss of knowledge. Lack of experience with alternative procedures that are not entirely dependent on things such as the supply chain, technology, proprietary disposables, or personnel may impact the ability to deliver care when there is a paradigm shift and expectant resources become unavailable.

Conclusion: Most wounds limited to one third of the leg can be closed without microsurgery or free tissue transfer. Review of alternative treatment methods may preserve knowledge and expand continuity of care when current standard treatment algorithms are interrupted.

Speaker

Todd Zuhlke
MD
PlasticsOne

9:00 AM

Minimally invasive burn excision with epidermal autografting in pediatric patients: a paradigm shift?

9:00 AM - 9:15 AM, Jan 31

Pikake I & II

Skin Substit…

Introduction:

The traditional approach to pediatric deep partial thickness burns has been a “watch and wait” attitude with frequent dressing changes, primarily due to evidence that pediatric burns will often heal, and that early debridement leads to removal of non-viable tissue. However, there is still significant morbidity with delayed healing, increased pain and dressing changes, prolonged hospital stays, added cost and hypertrophic scarring. Dermabrasion is a minimally invasive excisional technique that may preserve viable dermis while epidermal autografting can be used for partial thickness burns to facilitate wound healing. In an effort to improve outcomes, the authors evaluated the outcomes of dermabrasion with epidermal autografting in the pediatric population.

Methods:

A retrospective review of pediatric patients (< 18 years old) who underwent minimally invasive excision using dermabrasion with epidermal autografting as the only primary surgical intervention between January 2022 and July 2023 was performed. Patient information collected included: demographics, burn depth, mechanism of injury, percentage of total burn surface area (%TBSA), time to operating room (OR), length of stay (LOS), narcotic use (morphine equivalents), postoperative complications, need for autografting, and number of dressing changes requiring sedation. This was compared to previously conservatively managed patients as well as published historical data.

Results:

A total of 46 patients [mean age: 4.95 years (range: 0.04-18)] were examined with an average %TBSA of 7.45 (range: 0.3-19.75). The majority of patients sustained a scald injury (74%). Most patients (66%) had involvement of critical areas including the hands, face, feet or genitalia. Approximately 40% of the patients had Fitzpatrick Skin Type V-VI. The average time to OR was 2.7 days (range 0-8). Average length of stay/%TBSA was 0.45 days. The total number of dressing changings requiring sedation was 1.6 (range 0-7). Almost all patients (96%) had wounds that were >90% re-epithelialized by postoperative day 10. When compared to historical data, time to epithelialization was decreased by 5 days, grafting rate was decreased (11.5% to 6%), opiate usage was decreased in half (0.3 MME/kg/day to 0.15 MME/kg/day), infection rate was reduced to zero, and average LOS was decreased from 10.4 days to 3.6 days).

Conclusions:

Within the pediatric population, minimally invasive excision with epidermal autografting may be superior to conservative management with decreased length of stay, fewer dressing changes, decreased infections, decreased need for autografting and decreased opiate consumption. Length of stay can be significantly decreased with earlier operating room availability and swift decision making.

Speaker

AJ Sood
Resident Physician
Summa Health

9:15 AM

Pro-remodeling pathway activity positively correlates with UBM product mass applied in porcine full-thickness excisional skin wounds

9:15 AM - 9:21 AM, Jan 31
Pikake I & II
Skin Substit…

Macrophages that infiltrate wounds managed with decellularized urinary bladder matrix (UBM) polarize towards more pro-regenerative M2 phenotypes. Most of the available data supporting this finding is in rodents, although preliminary clinical evidence exists. To better understand the mechanism of action in a more clinically relevant animal model, macrophage polarization was assessed in a porcine model of healing of a full-thickness excisional wound Eight (8) 4 cm x 4 cm full-thickness excisional wounds were created on the dorsa of four (4) female Yorkshire pigs. Wounds were immediately treated with either: 1) standard bandaging only (standard of care), 2) 12.5 mg/cm ^{2} MicroMatrix, 3) 1-layer Cytal, or 4) 6-layer Cytal (n = 8 wounds). Biopsies were taken at 3 d, 7 d, and 14 d post-excision, and animals were sacrificed at 28 d. All wounds healed by 28 d, with UBM-treated wounds showed a slightly rate of wound closure than standard of care. Histopathological scoring indicated non-significant increases in the intensity and duration of immune cell infiltration in UBM-treated wounds. However, Picrosirius Red staining and CT-FIRE analysis indicated that at 28 d, collagen fiber alignment in UBM-treated wounds was more similar to native skin architecture than to wounds treated with standard of care (which healed to scar). Multiplex ELISA of wound biopsies revealed complex patterns in cytokine expression, including a trend of increased IL-1β, IL-8, and IL-10 expression as the amount of UBM product applied was increased. Bulk RNA sequencing depicted upregulation of classical macrophage activation, inflammation, and wound healing pathways by UBM products relative to wounds treated with standard of care. Importantly, however, M2-associated pathways were also upregulated, and the onset of upregulation occurred earlier with UBM products that were integrated and resorbed more quickly (i.e., UBM particulate). This observation is in accord with wound literature indicating that initial M1 activity is inevitable and probably important for wound healing, but that earlier and stronger shifts towards M2 phenotypes correlate with better outcomes. These results indicate that UBM provides an environment in which both the levels and timings of healing-associated processes are modulated and complex. Future work will further investigate the detailed mechanisms of these shifts and attempt to link them to clinically relevant functional outcomes.

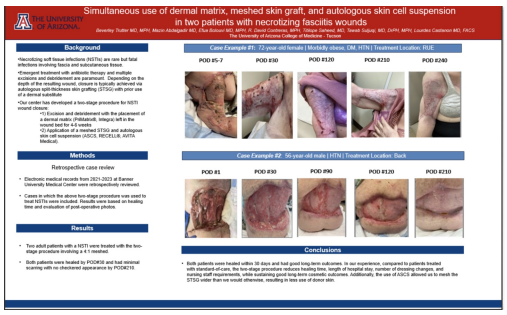
Speaker

Thomas Gilbert
Vice President, Research & Development
Integra Lifesciences

9:21 AM

Simultaneous use of dermal matrix, meshed skin graft and autologous skin suspension in two patients with necrotizing fasciitis wounds

9:21 AM - 9:27 AM, Jan 31
Pikake I & II
Skin Substit…



Speaker

Beverley Trutter
Resident Physician
University of Arizona

9:27 AM

Don’t be meek with the MEEK micrograft technique: Cases and Tips for Success

9:27 AM - 9:34 AM, Jan 31
Pikake I & II
Surgical

The MEEK micrograft meshing technique has been in existence since 1958 and a modernized version was put into practice in 1993. It has the ability to mesh from 1:2 all the way to 1:9, in a very consistent and easy to apply method. The MEEK technique is sometimes seen as very time-consuming and difficult, leading to poor adoption at some burn centers. In this brief report we will share our experience using the MEEK technique and how to incorporate it into cases without adding significant time and producing good outcomes. We will also discuss the potential for its use with other new autografting techniques to perhaps further increase its utility.

Speaker

Carl Schulman
Professor of Surgery - Senior Associate Dean for Research
University of Miami Miller School of Medicine

9:34 AM

Morning Break in Exhibit Hall

9:34 AM - 10:15 AM, Jan 31
General Meet…

10:15 AM

Plastic Surgery Case Series with Usage of pHA Cleanser

10:15 AM - 10:30 AM, Jan 31
Pikake I & II
Topical Treatm…

Introduction: Several recent guidelines recommend the use of pure hypochlorous acid (pHA) based products for wound bed preparation. The high margin of safety associated with the product, combined with its evidence-based ability to remove colonization/biofilm and necrotic tissue, make it a compelling choice in our plastic surgery practice. Primary closure of wounds following good wound bed preparation practice reduces the burden on patients and our institution. Our use for this specific type of cleanser has increased from sporadic to routine.

Methods: We present a quantitative view of our extent of adoption in a 60-day period, via retrospective chart review. We present 21 surgical patients, their wound etiologies, and wound closure times. We reviewed our EMR charts manually/electronically to obtain the extent of cleanser usage to augment our plastic surgery practice. In addition, we present several illustrative cases where visual images show the ability of the cleanser to eliminate visible slough/necrotic tissue.

Results: There were zero postoperative infections. One patient with hypertension had a postoperative hematoma. Skin graft take was 100% for the foot wound skin grafts. Skin graft take was 90% for the pelvic NSTI patient, who had flap tip ischemic loss of about 5% of the flap after ER transfer for pulmonary complications. Other patients all healed uneventfully within the standard accepted postoperative time periods. The calciphylaxis patient achieved 40% granulation of his infected wounds within 3 weeks postoperative, and he had significant pain relief. However, his renal failure progressed and he elected to transition to hospice.

Discussion: We have used evidence-based guidelines to guide our wound bed cleansing and preparation practice. Clinical and preclinical published data indicate that the safety and efficacy of the pHA based cleanser is high. Our high adoption rate is illustrated in the data. Wound bed preparation is based on wound visual inspection, sharp excisional debridement, occasional wound cultures, and irrigation and cleansing. We have used these techniques to prove, via the illustrative cases, that the use of pHA is a sound and safe way to achieve wound healing goals.

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Speaker

Abigail Chaffin MD, FACS, CWSP, MAPWCA
Professor of Surgery and Chief, Section of Plastic Surgery. Program Director - Tulane University/Ochsner Clinic Plastic Surgery Residency Program
Tulane University

10:30 AM

Use of hypochlorous acid as a topical therapy following skin grafting and as part of a burn center universal decontamination protocol

10:30 AM - 10:45 AM, Jan 31

Pikake I & II

Topical Treatm...

Introduction: Infections are a leading cause of morbidity and mortality in thermally injured patients. One of the strategies to prevent or reduce infectious complications in this population is to use topical antimicrobial solutions following skin grafting. Additionally, targeted and universal decolonization methods can eradicate methicillin resistant *Staphylococcus aureus* (MRSA) carriage and assist in reducing infectious complications. The purposes of this study are to describe the use of hypochlorous acid as a topical agent following skin grafting and to describe its use in a successful universal decontamination protocol.

Methods: In study one, patients with burns less than or equal to 20% total body surface area (% TBSA) were randomized post-operatively to either hypochlorous acid topical therapy or standard of care. Outcomes included graft viability, infectious complications, pain, and cost. In study two, patients admitted to the burn center were treated with a universal decolonization protocol which included topical hypochlorous bathing and nasal mupirocin. Outcomes included infectious complications and cost, compared to historical controls.

Results: In study 1, the demographic data demonstrated no difference patients treated with hypochlorous acid and standard of care. Graft viability was equal between the two groups as were infectious complications. Likewise, pain reported pain scores did not differ between the two groups. Cost analysis revealed and substantial savings with the use of hypochlorous acid over standard of care. In study two, implementation of the universal decolonization protocol resulted in a marked and significant reduction in the rate of MRSA infection in burn patients. There were no adverse events associated with the use of hypochlorous acid. This reduction in MRSA infection led to a significant cost savings for the burn center.

Conclusion: This review demonstrates that the hypochlorous acid is a versatile and useful tool in the prevention and reduction of infectious complications in thermally injured patients. It has been particularly useful in our center following burn excision and skin grafting, and in a universal decolonization protocol.

10:45 AM

Platform Wound Device - Novel and Simplified Negative Pressure Wound Therapy Device Without a Filler Material

10:45 AM - 11:00 AM, Jan 31

Pikake I & II

Surgical

All common negative pressure wound therapy (NPWT) systems include a filler material usually foam or gauze at the wound/device interface. The filler material increases airflow and thus increases the required pump capacity that can cause patient discomfort or even ischemia in wounds with compromised vascularity. In addition, foam or gauze may fragment and become colonized with bacteria over time. To mitigate these, negative aspects, we have developed a new impermeable single layer component membrane dressing to deliver NPWT that does not need a foam or gauze to function. The purpose of this study is to introduce Negative Pressure - Platform Wound Device (NP-PWD).

Materials and Methods

The NP-PWD is a transparent, single component dressing that consists of an impermeable polyurethane membrane. It has a permeable adhesive base which is attached to the perimeter of the wound, enabling fast Band-Aid-like application. The suction pump is connected to the underside of the membrane with tubing. The inner surface of the PWD contains pyramid-like structures protruding toward the wound. Once the suction pump is turned on and the desired negative pressure is achieved, the embossed membrane is pulled into contact with the entire surface area of the wound and the space between the pyramids is providing channels for even distribution of negative pressure as well as for exudate removal. Folds in the membrane provide secondary channels for negative pressure and fluid removal. The NP-PWD has been extensively validated in preclinical large animal models as well as in clinical case series.

Results

The results have demonstrated that the NP-PWD can function effectively at lower negative pressures (-80 mmHg and -50 mmHg) promoting healing, reducing tissue necrosis, inflammation and bacterial burden in the wounds. Importantly, when compared to the conventional devices, with foam or gauze, no differences were observed. Clinical studies have reported that patients tolerate the NP-PWD well. In addition, the possibility to monitor the wound without dressing removal has proven to be beneficial in a clinical setting.

Conclusions

The NP-PWD is a simplified, single component NPWT system eliminating the use of the filler material that commonly causes challenges during treatment.

Speaker

Kristo Nuutila
Principal Research Scientist
United States Army Institute of Surgical Research

11:00 AM

Cost Effectiveness of DHACM in Medicare Patients with Venous Leg Ulcers

11:00 AM - 11:15 AM, Jan 31
Pikake I & II

Skin Substit…

Aim: To evaluate the cost-effectiveness of Dehydrated Amnion Chorion Membrane (DHACM) in Medicare enrollees who develop a venous leg ulcer (VLU).

Method: This economic evaluation used a four-state Markov model to simulate disease progression of VLUs for patients receiving the advanced treatment (AT) with DHACM or no advanced treatment (NAT) over 3 years. The distribution of comorbidities between the NAT and AT groups. DHACM treatments were assessed when following parameters for use (FPFU), whereby applications initiated 30-45 days after the initial VLU diagnosis claim and reapplications occurred weekly to biweekly to ulcer closure. The cohort was modeled on 530,220 Medicare enrollees who developed a VLU between 2015 and 2019. Direct medical costs, quality-adjusted life years (QALYs), and the incremental monetary benefits at a willingness-to-pay threshold of $100,000/QALY were applied. Univariate and probabilistic sensitivity analyses were performed to test uncertainty of model results.

Results/Discussion DHACM allografts applied FPFU, dominated over NAT, with a lower per-patient cost of $170 and an increase of 0.010 quality adjusted life years (QALYs), over a three-year time horizon.

At a $100,000/QALY cost-effectiveness threshold, the incremental net monetary benefit was $1,178 per patient in favor of AT with DHACM FPFU over a three-year time horizon. The VLU recurrence rate was the parameter with greatest impact on model uncertainty. The probabilistic sensitivity analysis showed that AT with DHACM FPFU was cost-effective in 63.01% of simulations at the $100,000/QALY threshold

Conclusions In this economic evaluation AT using DHACM while FPFU was the dominant strategy, compared to no advanced treatment as it was cost saving and generated greater QALYs over 3 years from the US Medicare perspective. A companion VLU Medicare outcomes analysis revealed patients who received AT compared to patients who received NAT had best outcomes. The combination of improved outcomes with the noted cost savings of this analysis should motivate appropriate utilization, formulary adoption and coverage of DHACM FPFU to reduce VLU complications rather than treat a costly outcome that also unfavorably impacts patient well-being. Frontline wound care providers, Healthcare Institutions, and Payors, the gatekeepers to access for their clients suffering with chronic VLUs, should promote early intervention of VLUs for cost containment and the benefit of patients.

Speaker

William Tettelbach
Chief Medical Officer, Adjunct Assistant Professor
RestorixHealth, Duke University School of Medicine

11:15 AM

Using ECM Graft Placement to Stabilize Tissue and Modulate Inflammation in a Stage 4 Pressure injury- An Extreme Case

11:15 AM - 11:21 AM, Jan 31
Pikake I & II

Skin Substit…

Introduction:

Post-operative complications following flap closure of chronic wounds are common. Specifically, a retrospective analysis by Tran et al. [1] of 755 flap closures of pressure injuries demonstrated an overall complication rate of 25% at 30-day follow up. Similarly, Bamba et al.[2] demonstrated a complication rate of 58% in a prospective study of n=276 pressure injuries closed via flap advancement; with wound dehiscence (31.2%) and re-occurrence (28.6%) being most frequent complication.

[3]The complications associated with flap closure of these chronic soft tissue defects may be attributable to the poor quality of the underlying tissues, potential for dead space, and/or poor vascularity of the tissues in general.

Xenogeneic decellularized extracellular matrix (ECM) grafts have been utilized across a range of reconstructive procedures and serve as temporary scaffold to support cellular infiltration, capillary formation and ultimately are absorbed into the regenerating soft tissue. Ovine forestomach matrix ECM has been widely used in the management of wounds and for implant applications.[4-11]

OFM is antiinflammatory,[12,13] stimulates blood vessel formation [14], promotes scaffold infill and undergoes complete remodeling. [14]

Methods/Results:

We present an extreme of pressure ulceration with extensive undermining to include the right buttock and right hip. The OFM was utilized for the combination efficacy to include: Inflammation modulation, flap stabilization, and microbial resistance as a single stage reconstruction.

While there was evidence of flap failure, the tissue was stabilized adequately with the OMF matrix, with adequate coverage of bone allowing secondary healing to cover the previously exposed bone.

Conclusion:

OFM promotes scaffold infill and undergoes complete remodeling. In this extreme case, the OMF scaffolding allowed for tissue support and created adequate bone coverage, to allow for secondary wound progression despite flap failure.

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Speaker

Michael N. Desvigne
Plastic Surgeon
Abrazo Arrowhead Hospital

11:21 AM

NPWT (negative pressure wound therapy) after localized melanoma surgery

11:21 AM - 11:27 AM, Jan 31
Pikake I & II

Surgical

Background NPWT(Negative Pressure Wound Therapy) was considered contraindicated due to the hypothesis of rapid tumor recurrence after malignant cancer surgery. NPWT has been reported to provide evidence that wound recovery is the fastest growth of granulation tissue in the wound.

NPWT was applied after confirming histopathologic findings of no malignant tumor at the resection margini after Mohs Micrographic Surgery.

Aim To compare the local recurrence between SIH(secondary intention healing) and NPWT(negative pressure wound therapy) after localized melanoma surgery

Methods Retrospective review of 262 patients (120 SIH, 146 NPWT) from January 2000 to January 2018 was performed.

Results There was no significant difference in local recurrence between the two groups.

Mean age of the patients was 58.1 years (17~89 years, SIH 59.53, NPWT 58.87) and average Breslow thickness : SIH 1.66mm, NPWT 1.81mm.

Local recurrence rate was 22.18% in SIH(59 out of 120) and 21.23% in NPWT(31 out of 146).

Conclusions These results show that, despite the drawback of rather prolonged healing time, NPWT is an excellent therapeutic option for wounds after wide excision of melanoma on the foot, with acceptable functional and cosmetic outcomes.

Speaker

Kyoung Ae Nam
Wound Care Specialist, RN, MSN
Yonsei University SEVERANCE HOSPITAL, Dept. of Dermatology

11:27 AM

Successful Treatment of Keloid/Hypertrophic Scaring after Deep Partial Thickness Burns: Utilizing Staged Excision, Synthetic Dermal Substrate, and Thin Split Thickness Autograft.

11:27 AM - 11:33 AM, Jan 31
Pikake I & II

Reconstructive/Pla...

Introduction: Keloid and hypertrophic scar formation is a fibroproliferative disorder that complicates the healing of burn and trauma wounds. There is a known genetic component, but the exact mechanism of formation remains unknown. There is some relation to depth of injury, location over a joints or across tension lines and Fitzpatrick skin type. In addition to the problematic cosmetic appearance, there is significant symptomatology associated such as pruritis, nerve pain and limited range of motion that affects quality of life after a burn injury. We have a subset of patients with highly symptomatic hypertrophic and keloid scaring that do not improve with laser treatment or steroid injections. We present our results after a technique of scar excision and engraftment of polymer foam dermal substrate, followed by split thickness autograft with steroid injection.

Methods: A surgical option was offered to patients with symptomatic hypertrophic or keloid scaring that did not improve with laser treatment. The procedures consisted of a staged surgical approach. Initial procedure is full thickness scar excision and engraftment of polymer foam dermal substrate with placement of negative pressure wound therapy. Prior to placement of the dermal substrate the wound edges are treated with steroid injections. The second procedure is a thin (6 - 8 1/1000ths of an inch) split thickness skin graft after neovascularization of the dermal substrate. The wound edges were injected with 10 mg/ml of triamcinolone prior to grafting. Excised scars were all sent for pathological examination.

Results: We present two patients with upper extremity scar formation after deep partial thickness burns that healed without grafting. In both patients, the burns that developed scaring was located across a joint and the initial burn areas were larger than area of hypertrophic or keloid scar formation. These burns were 95% healed within 2-3 weeks from time of injury. The day of scar excision all symptoms resolved and have not returned allowing the patient to be off medication for nerve pain and itching. There was one complication: patient 1 had cellulitis develop around the dermal substrate 1 week after application. This was treated with antibiotics and did not require removal of the dermal substrate but delayed grafting by one week.

Conclusion: Hypertrophic and keloid scaring can be cosmetically dissatisfying, however the symptoms of nerve pain, pruritis, and scar contractures were more debilitating for these patients. These two patients are part of a subset of patients that silicone, garments, CO2 fractionated laser and/or steroid injections did not relieve symptoms. We demonstrate successful resolution of symptoms with a staged technique of scar excision and grafting with a dermal substrate. In the case of scar excision, the dermal substrate is incorporated in 2 weeks and ready for grafting. In addition to resolution of symptoms, there was no return of abnormal scaring in follow up from 6 months to 2 years.

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Speaker

Nicole Bernal
The Ohio State University Wexner Medical Center

11:33 AM

Diversity of Soft Tissue Injury Coverage with Autologous Skin Spray in Complex Traumatic Injuries and Unusual Cases

11:33 AM - 11:39 AM, Jan 31
Pikake I & II

Skin Substit…

Introduction

Full thickness defects left by devastating soft tissue injuries continue to be a challenge to providers. Mechanisms may include direct trauma, devastating infection (necrotizing fasciitis), TENS and at times misadventures in surgical resections. The defects that remain depending on the reconstruction can have significant effects on future scarring, appearance and function. Historically, local flaps, free flaps and skin grafts have provided the bulk of our reconstructive options. More recently, newer autologous skin spray has been added to our armamentarium of options both for its benefits in donor site reduction as well as an adjunct to acceleration of wound closure.

Methods

Multiple examples of complex trauma and some common cases were identified for closure utilizing autologous skin spray. Age ranges from 21yo to 68yo, equal numbers of males and females and varying sizes for wounds. The set of patients included patients of multiple ethnicities and Fitzpatrick Scale were included. All but one case had full thickness injury. Risk factors and co morbidities were also complex including hypertension, diabetes, vascular disease, autoimmune conditions, malignancy, psychiatric illness to name a few. No significant infection was identified with use of the skin spray. All patients had adequate follow up to assess the wound closure. Additionally, application of the autologous skin spray enabled the donor sites to close in less than 2 weeks time some in a shorter interval.

Results

All cases benefited from the use of autologous skin spray in some portion of their reconstructive journey. Certain cases benefited from its use on initial presentation to surgery where others had it applied at a later interval based on presentation to the service. In one patient who had had a prior history of a wound taking 273 days to closure had a new traumatic wound of a larger size closed with the autologous skin spray in 46 days. Unexpectedly, patients had faster closure of their donor sites with spray of the autologous skin spray in self comparative controls when used. Patients also complained less of donor site pain when compared to historical controls.

Conclusions

Autologous skin spray technology is a viable option for wound closure in a variety of soft tissue injuries and defects. Given its success in devastating injuries in burns, few studies have explored its role and potential use in other soft tissue injuries/defects. Further studies need to be done to better understand how it can be used in these diverse injuries as well as to see how it comparatively ranks compared to conventional skin grafts in terms of scarring. Our series demonstrates the diversity of injuries autologous skin spray has in accelerating wound closure.

Speaker

Roselle Crombie
Surgeon, Faculty
Yale New Haven Health

11:39 AM

Novel Peel and Place Negative Pressure Wound Therapy (NPWT)* Dressing Preclinical Proteomic and Finite Element Evaluation

11:39 AM - 11:45 AM, Jan 31
Pikake I & II

Surgical

Introduction: A novel peel and place† NPWT dressing has been developed to allow for long term use without the complication of tissue ingrowth which may occur when reticulated open cell foam (ROCF)^ is left in place longer than 3 days. Tissue strain environments have been evaluated with finite element analysis (FEA) and wound healing response in a swine model.

Materials and Methods: All animal work was approved by the relevant Institutional Animal Care and Use Committee and complied with all applicable national and local regulations. Full-thickness excisional paraspinal wounds were created in 11 swine. Continuous negative pressure, at -125mmHg, was administered for 7 days to both ROCF and peel and place dressings. A single dressing change was performed on day 4. Biopsies were collected from wound beds on term day 7. Total protein was extracted and analyzed using multiplex protein assays.

Finite element modeling of tissue strains was completed using wound models created with dimensions and/or mechanical properties for tissue layers derived from clinical evidence/literature. Simulations in this environment were evaluated for peel and place and ROCF dressings using continuous -125 mmHg NPWT.

Results/ Discussion: Multiplex protein assays of tissue lysate performed on peel and place managed wounds showed greater levels of wound healing associated cytokines such as IL-1a (859 vs. 86.4 ng/g total protein), IL-1b (1e4 vs. 456 ng/g), and IL1-ra (951 vs. 161 ng/g total protein) compared to tissue managed with ROCF. Peel and place managed wounds exhibited greater relative concentrations of HB-EGF (19.36 vs. 5.381 ng/g), PDGF-AA (15.46 vs 11.14 ng/g), TGF-a (8.253 vs. 1.861 ng/g) compared to ROCF managed wounds.

Finite element analysis (FEA) of novel dressing under -125 mmHg produced peak and lower tissue strains of 18% and 4%, respectively, that extended several mm into the wound bed, while ROCF exhibited peak strains of 40% at shallower depths. ROCF produced downward tissue displacement at wound-foam strut contacts. Downward displacement was seen in the peel and place dressing along the wound edge. Overall, tensile strains were more homogenous at the deep wound bed in the peel and place dressing model.

Conclusion: Cells respond to imposed forces/strains by producing biochemical stimuli.º The homogenous tissue strains and deeper propagation of forces seen in the novel dressing FEA model may contribute to the differences in levels of cytokines/chemokines and growth factors compared to ROCF.

*Peel and Place Dressing; *3M™ V.A.C.® Therapy; ^ 3M™ V.A.C.® Granufoam™ (3M Company, San Antonio, TX)

*Dunn, S. L., & Olmedo, M. L. (2016). Mechanotransduction: Relevance to Physical Therapist Practice Understanding Our Ability to Affect Genetic Expression Through Mechanical Forces. Physical Therapy, 96(5), 712-721. doi:10.2522/ptj.20150073

Speaker

Kris Kieswetter
Sr Director, Applied Sciences
3M

11:45 AM

Long term skin quality after dermal skin substitute and split thickness grafting

11:45 AM - 11:51 AM, Jan 31
Pikake I & II

Skin Substit…

Introduction:

Dermal scaffolds have been used in burn wound closure and scar reconstruction for decades. Several studies have looked at the Vancouver Scar Scale and histology of these so created scars up to about 18 months post surgery, but there is only one study available looking at the long- term outcome after 5-10 years in detail, including objective measurements and histology, and all those patients received the template for scar reconstruction, not acute coverage. The purpose for using a dermal template is to create a scar that behaves and looks more like normal skin, thereby avoiding some of the contractures and hypertrophy of split thickness skin grafts. This is the long term follow up of a single center experience with dermal template use in acute and subacute burn care more than 2 years post surgery.

Material and Methods:

All patients who received dermal template in our center between 2002 and 2020 were queried. Of 236 records found, 56 patients were attempted to be contacted, of which 18 answered and 15 actually presented for an appointment. The majority was male, the average age was 47 years, their scars were between 24 months and 25 years old. All patient's scars were evaluated with objective and subjective scar evaluation tools (Vancouver Scar Scale VSS, Patient Observer Scar Assessment Scale POSAS, Spectrometry, Cutometer, High Definition Ultrasound, Semmes-Weinstein Filaments, Photography), in the area of dermal- template- scar, a comparable area of split- thickness- skin -graft -only scar and, if available, an area of healthy skin close to the scar areas. The patients were also asked if they would agree to a biopsy of their two scar areas, which most, but not all, agreed to.

Results:

The subjective evaluation showed slightly better results in the dermal template scar areas. The thickness and elasticity was closer to healthy skin in the template scars (1.6mm vs 2.2mm; 0.72 vs 0.9), while pigmentation and sensation was slightly better in the STSG only scars (34.8 vs 34.6; 5.9 vs 5.5). Some of the histologic findings will also be demonstrated.

Conclusion:

Long term outcome of template augmented burn scars shows that the scars are durable and maintain better skin quality over years when compared to only STSG scars. Especially high definition ultrasound is able to demonstrate thickness and structure of these scars in vivo. Limitations of this study are multiple and will be discussed.

Speaker

Sigrid Blome-Eberwein
Associate Director Burn center
Lvhn

11:51 AM

The Impact of Racial and Socioeconomic Disparities in Discharge Disposition in Burn Survivors: A National Study

11:51 AM - 11:57 AM, Jan 31
Pikake I & II

Msc./Economy/Basic S…

Speaker

Manuel Castillo-Angeles
Postdoctoral Research Fellow
Brigham and Women's Hospital

11:57 AM

Clinical Experience with Fish Skin Graft in Full thickness burns

11:57 AM - 12:03 PM, Jan 31
Pikake I & II

Speaker

Ariel Aballay

12:03 PM

The Viability Profile of Morselized Dermal and Cartilage Grafts with a Morselizing Device

12:03 PM - 12:09 PM, Jan 31

Speaker

Thomas Davenport
Partner
Long Island Plastic Surgical Group, PC

12:30 PM

Lunch Symposium - Kerecis: From Sea to Recovery: Real world clinical perspectives using fish skin technology for the treatment of burn injuries

12:30 PM - 1:30 PM, Jan 31
Puakenikeni Room

General Meet…

Explore the future of burn and trauma care as a panel of surgeons share their expertise and insights into the utilization of fish skin grafts for treating traumatic injuries. The focus will encompass the clinical abstracts and case studies presented by each surgeon, offering a comprehensive exploration of the efficacy and applications of fish skin grafts. The symposium will also delve into the underlying scientific principles behind this innovative approach, providing attendees with a deeper understanding of the biological advantages that contribute to successful outcomes.

Speakers

Alfredo Cordova
Acute Care Surgeon
Sarasota Memorial Hospital

Rajiv Sood
Chief of Plastic Surgery and Burn Reconstruction
JMS burn center

Ram Velamuri Plastic and Burn Surgery

Ariel Aballay

6:00 PM

Symposium Sunset Cocktail and Dinner Sponsored by Kerecis

6:00 PM - 8:30 PM, Jan 31

Kaho'olawe Lawn

General Meet…

Join us for a lovely dinner on the lawn with a special performance by *The Voice* contestant, Jason Arcilla.

8:30 PM

Symposium Dinner After Party Sponsored by PMI

8:30 PM - 11:59 PM, Jan 31

General Meet…

Thu, Feb 01, 2024

6:30 AM

Breakfast Symposium - Integra LifeSciences: Choice Matters: Different Technologies Offer Different Solutions

6:30 AM - 7:30 AM, Feb 1

Puakenikeni Room

General Meet…

Hear our panel of surgeons discuss their experiences, approaches and use of different technologies in the management of complex wounds.

Speakers

Roselle Crombie
Surgeon, Faculty
Yale New Haven Health

Juvonda Hodge
Medical Director
University of Mississippi Medical Center

Peter Arnold
Chief, Plastic and Reconstructive Surgery
The University of Mississippi Medical Center

7:00 AM

Continental Breakfast

7:00 AM - 8:00 AM, Feb 1

Pikake I & II Foyer

7:45 AM

Use of an Intravascular Warming Catheter to Maintain Normothermia During Burn Surgery

7:45 AM - 8:00 AM, Feb 1

Pikake I & II

Technolo…

Introduction: Hypothermia has adverse consequences in burn patients and has been associated with worse outcomes and increased mortality. Burn patients are predisposed to hypothermia due to large fluid resuscitations, heat loss through burned skin, and exposure during wound care and in the operating room. In the OR, general anesthesia blunts the metabolic and neurologic response, making it harder to maintain normothermia. This case comparison demonstrates the effectiveness of using an intravascular warming catheter to maintain normothermia during burn surgery.

Methods: We present 2 cases to compare the intra-operative temperatures during extensive excision and grafting procedures. The first case was a 51 year old male with a 43% TBSA who underwent excision and allograft placement to 25% TBSA. The intravascular warming catheter was placed preoperatively and its use started at the beginning of the case. The second case was a 42 yo male with a 63% TBSA burn who underwent excision and PLA skin substitute placement to 50% TBSA. The intravascular warming catheter was placed during the case after clinically significant hypothermia was present.

Results: For the first case where the intravascular warming catheter was placed pre-operatively no clinically significant hypothermia occurred for the duration of the 3.5 hour case with temperature always maintained above 36° C (see Figure). For the second case where the intravascular warming catheter was not placed until hypothermia was present, the temperature initially dropped to < 35° C but was able to be raised and maintained at 36 ° C and the 5.5 hour case was able to be completed without interruption by placing the intravascular warming catheter (see Figure).

Speaker

Carl Schulman
Professor of Surgery - Senior Associate Dean for Research
University of Miami Miller School of Medicine

8:00 AM

Antimicrobial quaternary ammonium silane K21 promotes wound healing

8:00 AM - 8:15 AM, Feb 1

Pikake I & II

Infection

Chronic and non-healing wounds are one of the major complications associated with diabetes mellitus, leading to limb amputation, disability, and death. Given the stunning global rate of 10.5% for diabetes and 37.3 million people with diabetes in the USA (11.3% of the US population), there is a dire need for novel therapeutics that are both effective and inexpensive for patients with diabetic chronic wounds. Here, we examine the ability of the novel quaternary ammonium silane molecule K21 to promote wound healing. K21 exhibits bactericidal, viricidal, and fungicidal activity, and this antiseptic is relatively safe with less toxicity and greater efficacy compared to other antiseptics like chlorhexidine, benzalkonium chloride, and other quaternary ammonium compounds. Using a mouse model of diabetes type 2, we tested whether topical treatment with K21 could accelerate the wound healing process under diabetic conditions. We used commercially available homozygous *db*/*db* mice (the *Lepr*^{db} JAX® Mice Strain), which demonstrate morbid obesity, chronic hyperglycemia, pancreatic beta cell atrophy, and the development of hypoinsulinemia. Mice were separated into two different groups: diabetic placebo (*db/db* P group, n= 15) and diabetic K21 (*db/db* K21 group, n=15). Using disposable biopsy punches, 6 mm skin wounds were established on the dorsal side of each mouse and then treated with topical K21 or vehicle control every other day until complete wound closure was achieved in 10 days. We observed that K21 treatment significantly ($p<0.05$) improved wound closure. We processed tissues from wounded areas by flow cytometry to quantify molecular and cellular indices of wound healing, and we observed significantly ($p<0.05$) enhanced expression of procollagen type 1, CD26, and VEGF in K21-treated samples compared to those from vehicle-treated subjects. Using murine primary fibroblasts in a separate scratch assay, we demonstrated that K21 treatment accelerated fibroblast regrowth and the expression of wound healing markers in this *in vitro* wound healing model. As macrophages play a critical role in pathogen clearance and wound healing, we also examined the effects of K21 on primary human monocyte-derived macrophages. We used flow cytometry and single cell transcriptomics to analyze these cells, which revealed a potential role for K21 in the early differentiation of monocytes into macrophages. Furthermore, we observed positive effects of K21 treatment on both mitochondrial fission and mitophagy in multiple cell types *in vitro*, which might contribute to the renewal of the metabolic niche necessary for better wound healing. Finally, we found that these effects of K21 on mitochondria are deeply conserved over evolution, as a short treatment of K21 triggers similar changes in dynamics and mitophagy in whole *C. elegans* nematodes *in vivo*, resulting in a significant ($p<0.01$) 40% increase in lifespan. Taken together, our results indicate that K21 accelerates wound healing at least in part by promoting angiogenesis, collagen deposition, macrophage differentiation, and mitochondrial dynamics and quality. We suggest that K21 is a safe and affordable novel compound with potential use in the treatment of non-healing diabetic wounds, warranting further research and clinical trials.

Speaker

Christopher Rongo
Professor
Rutgers University

8:15 AM

Digital Documentation in the Burn Center

8:15 AM - 8:30 AM, Feb 1

Pikake I & II

Technolo…

Speaker

Anjay Khandelwal
Chief, Division of Burn Surgery; Director, Burn Institute; Program Director, Acute and Reconstructive Burn Fellowship
Akron Children's Hospital

8:30 AM

Temporal Examination of Collagen-Elastin Matrix Vascularization and Remodeling within a Full-Thickness Wound

8:30 AM - 8:45 AM, Feb 1

Pikake I & II

Skin Substit…

Introduction

Dermal matrices are commonly utilized to regenerate a healthy wound bed prior to split-thickness skin graft application. These matrices vary substantially in composition and form, and as such, have vastly different outcomes in terms of vascularization, cellular infiltration and remodeling post-application. The goal of this study was to examine the biological response to these matrices over time and understand how these matrices contribute to wound healing.

Methods

To examine collagen-elastin matrix (CEM) remodeling, a female red Duroc pig model was utilized to facilitate frequent biopsy collection. First, 2 x 1 in full-thickness acute surgical wounds created on the dorsum of red Duroc pigs following an IACUC approved protocol (10 sites per pig, 6 pigs). CEMs (1 and 2 mm thick) were applied to the wound beds shortly after injury with split-thickness skin grafts (1:1.5) applied immediately, D0, or 4, 8 or 14 days following CEM application. Sites with only STSG served as controls. Biopsies (4mm) were collected on D4 and weeks 1-8 and week 12. Biopsies were embedded in OCT, cryosections and stained using H&E, Herovici's (mature vs. immature collagen) and Picrosirius Red (collagen type I and type III and collagen organization). Slides were examined using brightfield or confocal microscopy with at least 4 unique sections per block per time point. Image analysis was performed using ImageJ. All quantitative data were analyzed using a One-Way ANOVA with a Tukey posthoc test.

Results

Data collected to date show similar cellular responses in the 1mm and 2mm CEMs with significant cellular infiltration observed by D4 post-application. Evidence of vascularization is present at D4 with small vessels entering the matrix from the bottom of the scaffold. By D7, the entire matrix (both 1 and 2mm) is vascularized with many larger vessels throughout. Myofibroblast populations were transiently present within the matrices, more commonly in the lower regions and in matrices where STSGs were applied at later time points. As the CEM was bioabsorbed, new host collagen was deposited within the wound bed with collagen fibers becoming thicker with time.

Conclusions

In a porcine model, CEMs appear to serve as a scaffold providing a porous matrix into which cells can infiltrate and deposit extracellular matrix proteins. These scaffolds facilitate rapid vascularization and support STSG application when applied in <14 days.

Applicability of Research to Practice

Data suggest the use of CEM provides a provisional matrix to support fibroblast migration and ECM production in the wound bed, preparing it for STSG application.

External Funding

This project was supported by a grant from Access Pro Medical.

Speaker

Heather Powell
Professor
Ohio State University

8:45 AM

Anacaulase-bcdb in large burns: extending past 30% TBSA burn injury and 20% TBSA total enzymatic treatment

8:45 AM - 9:00 AM, Feb 1

Pikake I & II

Surgical

Introduction: Anacaulase-bcdb (bromelain) was recently FDA approved as a debriding agent for thermal burns, but with a maximum treatment area of 20% TBSA. During the continued access study, a subset of patients with >30% TBSA burns were enrolled and another small subset had up to 30% TBSA treated. The purpose of this study is to describe the feasibility and safety of a single center's experience patients with large burns and those with >20% TBSA treated with the enzyme.

Methods: This was a retrospective, single center study of patients prospectively enrolled in the NEXT study. Patients with >30% TBSA burn injury and/or >20% TBSA treated with anacaulase were included in the study. Demographics, injury characteristics, and outcomes were tabulated and compared to a group of matched controls with a Mann Whitney test for continuous variables or a Fisher's exact test for categorical variables.

Results: Between 10/21 and 8/23, 6 patients with >30% TBSA were included in the study, with a median of 39% TBSA (26% deep partial thickness and 10% 3 rd degree). Average age was 34.2 years, length of stay was 39 days (1.13 days/%TBSA). Four patients had >20% TBSA treated. Two pediatric patients with >30% TBSA surface area but only 15% treated with the enzyme were also included. All patients were treated with a combination of split thickness autograft and autologous skin cell suspension. When compared to burn-size matched controls, trends for shorter LOS (1.13 vs 1.5 days/%TBSA, p=0.37) and fewer surgical procedures (6 vs. 8) emerged, but the differences were not statistically significant. None of the patients suffered mortality and no differences in infections, complications, or graft loss were detected.

Conclusions: Preliminary data suggests the use of anacaulase based enzymatic debridement on patients with larger burn size appears to be feasible without an increase in adverse outcomes. Although the FDA indications have a limit of 20% TBSA total treatment area, there may be a subset of patients who benefit from "off-label" use and treatment of larger surface area. Further granularity on patient selection and safety must be elucidated in additional studies.

Speaker

Steven A. Kahn
Professor of Surgery, Chief of Burn Surgery
Medical University of South Carolina

9:15 AM

Use of Polylactic Acid Membrane in Scalp Reconstruction with Anticipated Reoperative Flap Elevation

9:15 AM - 9:30 AM, Feb 1

Pikake I & II

Skin Substit…

Background: Polylactic acid membranes have specific characteristics beneficial to wound management, often serving as a synthetic skin substitute. FDA approved use in the United States has been largely limited to placement as a dressing when regenerative potential exists in the underlying tissue bed; uses include partial thickness burns and partial thickness wounds, such as abrasions. Specific characteristics of polylactic acid membrane include resistance to infection with degradation at a pH of 5.5 (initial) to 4.0 in vitro creating an acidic environment, vapor permeability (40-70 mL/m2 per hour) preventing fluid collection below the microporous membrane, and reduction in pain and narcotic use, likely in part due to the intrinsic properties of a dressing, but also due to the need for only one-time application. Other properties of synthesized polylactic acid membranes include variable pore size constructs. Products with a micropore size that prevent fibroblast migration and ingrowth consequently do not function as dermal repair templates, but also resist subsequent adhesion formation. Polylactic membranes undergo hydrolysis with resultant predictable and timed degradation. These properties make this type of membrane ideal for potential reoperative wound beds when alternative revascularization can be planned with the primary reconstruction, such as with use of crane flaps. Additionally, polylactic acids may have improved handling over currently available adhesion barrier films.

Intervention: Three patients, including two for recurrent cerebral tumors and one for an infected bone flap following decompressive craniectomy for subdural hematoma, were selected. Five procedures were performed in which a polylactic acid membrane was placed. In two patients, the polylactic acid membrane was placed directly over the dural closure at the site of cranial defect. In one of the two patients a polylactic membrane was placed during multiple staged procedures facilitating re-elevation of the scalp flap (a video is presented). This patient subsequently had a polylactic acid membrane applied following placement of a custom Polyether Ether Ketone (PEEK) implant. In the third case, following recurrent meningioma, the polylactic acid membrane was placed over a bone flap, followed by a dermal repair matrix to buttress the closure. In the two cases with absent bone flaps, wound dehiscence had occurred after the index craniotomy, and one patient had received radiation, concerning for intracranial infection risk and wound healing difficulty.

Results/Outcomes: One patient required multiple procedures resulting in serial re-elevation of her scalp flap. Limited, if any, adhesions to the underlying dura were appreciated after two applications of polylactic acid membrane. The other two patients healed to completion and have not yet required return to the operating room due to further recurrence, but reoperation may be required and anticipated, as both had recurrent disease.

Conclusion: Placement of a polylactic acid membrane does not facilitate, enhance, or buttress wound closure. However, it does appear to facilitate re-elevation without potential damage to the underlying dura or compromise to the overlying scalp flap. Polylactic acid membranes can be placed to prevent adhesion formation to the underlying dura in conjunction with a dermal repair matrix as a composite implant so that the polylactic acid membrane may prevent adhesion formation from the overlying flap to the dura while the dermal repair matrix may buttress the flap closure provided revascularization can occur in a top-down fashion. This may be a useful adjunct when infection risk is high, an infection may be catastrophic, or when wound healing may be compromised or delayed, such as the case may be following radiation therapy, with heavy scar burden, previously open wound, or in a multiple reoperative field.

Speaker

Todd Zuhlke
MD
PlasticsOne

9:30 AM

Treatment of Burns with a Novel Combination of Autologous Skin Cell Suspensions and a Synthetic Skin Substitutes: A Case Series

9:30 AM - 9:36 AM, Feb 1

Pikake I & II

Skin Substit…

Purpose: Dressings following burn are integral to managing pain, optimizing wound healing, preventing infection, and minimizing healthcare costs. Autologous skin cell suspension (ASCS) is now frequently used for medium-to-large thermal wounds and the standard dressing following ASCS application has traditionally been a nonadherent contact layer dressing. The poly-lactic acid dressing (PLAD) is a synthetic skin substitute designed to enhance wound healing and is a recent addition to burn surgeons' armamentarium for treatment of acute thermal injuries. There is little known about the co-administration of ASCS and PLAD to date. We present our first series of patients who received both technologies in the management of acute thermal injuries at our institution and outline the clinical findings.

Methods: A retrospective review of all patients treated at an ABA-accredited burn center from January to October 2023 was conducted. Patients whose burn management involved a combination of ASCS and PLAD dressing were included. All surgeries were performed by a single surgeon (DB). The PLAD dressing was applied at the conclusion of the burn surgery to create an optimal environment for graft take and wound healing. It was left in place and allowed to detach from the wound once healed. Medical records were reviewed and information of demographics, burn characteristics, operative details, and postoperative outcomes were noted. Descriptive statistics were used to summarize findings.

Results Ten patients met the inclusion criteria and were included in the cohort reviewed; 8 males (80%) and the average age was 34 years. The most common mechanisms of burns were flame (n=5, 50%) and scald (n=4, 40%). The upper extremities were the most frequently treated area (n=6, 60%%) followed by the lower extremities (n=5, 50%). The median time to first surgery across all thermal injuries was 5.5 days [IQR 4,9] and the average treated burn size was 2075 cm^2 (SD = 1537 cm^2). Median postoperative length of stay was 2 days [IQR 1,7] and the median time to wound closure was 15 days [IQR 14,24] with an average of 2 postoperative visits required prior to wound closure. No patients required additional surgery for treated areas. No wound healing complications or infections were noted. Patients reported good satisfaction with healing outcomes at follow-up visits.

Conclusions: Burns may be effectively managed through a combination of ASCS and synthetic skin substitutes such as the PLAD dressing. This approach may reduce hospital length of stay, dressing change frequency, postoperative visits, and additional surgeries required, which may consequently reduce hospital costs. Ongoing work is continuing to monitor outcomes in an expanded patient cohort with plans to include an analysis of cost and functional outcomes.

Speaker

Cody Fowler
Plastic Surgery Resident Physician
Kessler Burn & Trauma Center, University of Rochester

9:36 AM

Primary microvascular reconstruction of extremities in a high voltage electrical injury patient

9:36 AM - 9:42 AM, Feb 1

Reconstructive/Pla…

Purpose

Electrical injury is classified as a more complex injury than pure thermal injury because of concomitant neurovascular injuries caused by electric flow. Therefore, microvascular reconstruction is often considered as a contraindication in burn injuries. Authors present a case of successful limb salvage from high voltage electrical burn patient from microsurgical reconstruction.

Methods

A 54-year-old male was injured form high voltage electrical injury from an industrial electric transformer resulting third degree burn in 20% of total body surface. After a week of intensive care unit management, the patient was resuscitated from rhabdomyolysis. Primary reconstruction (within 21 days) using free superficial circumflex iliac artery perforator (SCIP) flap and free anterolateral thigh (ALT) flap followed by subsequent split thickness skin graft (STSG) were performed on 20^{th} day after burn.

Results

Right elbow joint was covered with SCIP flap and right ankle joint was covered with ALT flap. Both upper extremity except joint areas are covered with STSG. Joint contractures and unstable scars were not detected in 6 weeks after surgery.

Conclusion

Regarding the functional and aesthetic result of free tissue transfer, microsurgical reconstruction of electrical burn patient should not be abandoned. However surgeons are advised to use deep vasculature (brachial vein or posterior tibial vein) because most of cutaneous veins and nerves are injured from electrical current.

Speaker

Daiwon Jun
Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea

9:42 AM

Targeting Inflammation and Granzyme Serine Protease Activity in Burn Wound Healing

9:42 AM - 9:48 AM, Feb 1

Msc./Economy/Basic S…

Granzymes (Granule-secreted enzymes) are a family of immune cell-serine proteases that were once thought to function primarily as executors of cytotoxic lymphocyte-mediated target cell death. However, in recent years this paradigm has been challenged. It is now recognized that granzymes contribute to other processes such as inflammation, epithelial dysfunction, and extracellular matrix degradation. Elevated extracellular Granzyme B (GzmB) is observed in murine and human burn wounds. Studies using GzmB knockout mice suggest a role for GzmB in decorin cleavage resulting in disorganized collagen fibrillogenesis, TGFb release, and scarring. We have recently developed a topical inhibitor of GzmB and have demonstrated efficacy in vivo in models of thermal injury. To further understand how GzmB impairs wound healing, a degradomics approach was utilized to better understand how dysregulated GzmB impacts inflammation and impaired healing. Preliminary analyses suggest that in addition to matrix degradation and inflammation, GzmB also contributes to the loss of cell adhesion as well as the activation of other proteases. In summary, GzmB contributes to impaired healing by exacerbating inflammation, extracellular matrix degradation and potenially mechanisms involving the activation of other proteases.

Speaker

David Granville
Professor and Director
University of British Columbia

9:48 AM

BREAK

9:48 AM - 10:15 AM, Feb 1
Pikake I & II Foyer
General Meet…

10:15 AM

Clinical Evaluation of A Donor-Site Sparing Protocol Implementing Non-tangential Debridement and Application of a Porcine Small Intestinal Submucosa Extracellular Matrix for Managing Partial-Thickness Burns in Pediatric Patients: A Case Series

10:15 AM - 10:30 AM, Feb 1
Pikake I & II
Skin Substit…

Introduction: The incidence of burns is higher in children than in adults and continues to be a challenge for burn centers (PMID: 33456937). Adverse outcomes such as pain and hypertrophic scarring of autograft donor sites are prominent in the pediatric burn population (PMID: 30824160). Therefore, there is a clinical need for techniques to maintain tissue viability and reduce the secondary donor site creation while maintaining reliable functional and cosmetic outcomes. Skin substitutes, such as porcine-derived small intestinal submucosa (SIS) matrix, provide a natural extracellular matrix and growth factors to support burn wound closure (PMID: 24823330). A recent successful protocol using hydrosurgical debridement and SIS grafting in an adult population was published (PMID: 28220597). In this case series, we aim to assess the efficacy of a similar donor-site sparing treatment protocol for the management of partial-thickness burns in a pediatric population.

Methods: Data was collected from a retrospective electronic medical record review to obtain clinical photographs, demographic details, wound care management and postoperative outcomes. Patients had planned follow-up of 3-months minimum. Descriptive statistics were used to summarize findings.

Results: A case series of six pediatric superficial to deep partial-thickness burn patients was collected. The patient's ages ranged from 9 months to 16 years with no previous history of burn injuries. Three patients presented to the hospital on the initial day of injury, two on day 1, and one patient on day 3. Burn Total Body Surface Areas (TBSA) ranged from 1-6% resulting from friction, scald, or contact burns. At presentation all patient burns were treated with topical antimicrobial and non-adherent dressings. Subsequent wound management included one patient treated outpatient with CCO (SANTYL, Smith-Nephew), two patients being hydrosurgically debrided (VERSAJET, Smith-Nephew), and three patients treated with CCO followed by hydrosurgical debridement. Post-debridement, a porcine SIS skin substitute (OASIS BURN MATRIX, Smith-Nephew) was applied to partial-thickness burn areas using a protocol of rehydration, non-adherent contact dressing and secondary compressive layers. Two patients required second SIS applications in deep-partial thickness areas to support wound closure one and two weeks post initial application, respectively. Dressings were changed weekly. Average time to re-epithelialization ranged from 2 weeks to 2 months and was largely dependent on the depth of the burn with deeper injuries requiring additional SIS application and time to closure. All patients had good functional outcomes; dyschromia of the wounds varied from mild to moderate; there has been no evidence of hypertrophic scarring as seen in the average three-month follow-up.

Conclusion: A donor-site sparing treatment protocol implementing non-tangential excisional debridement and application of a SIS skin substitute resulted in good functional and cosmetics outcomes in a pediatric burn population.

Speaker

Hana Lopez-Quinones
Burn Director
Jacobi Medical Center

10:30 AM

Autologous Skin Cell Suspensions for Lower Extremity Trauma Reconstruction

10:30 AM - 10:45 AM, Feb 1
Pikake I & II
Skin Substit…

Purpose: Reconstruction of severe lower extremity traumatic injuries requires stable skin coverage over skeletal fixation to help restore patient's premorbid function. The Latissimus Dorsi (LD) flap is a favorite option due to its broad coverage, reliability, and adaptability but necessitates split-thickness skin grafting (STSG). Autologous skin cell suspensions (ASCS) applied with STSG permit use of more extensive meshing ratios and limit the size of donor skin required. This inaugural case series describes the outcomes of lower extremity trauma reconstruction employing LD flaps combined with STSG and ASCS.

Methods: A prospective case series involving patients with complex lower extremity trauma, treated with LD flap reconstruction alongside STSG and ASCS by a single surgeon (ER) at our institution, starting in January 2023, was conducted. Medical records were reviewed to collect data on demographics and perioperative details. Patients were followed for a minimum of 6 months. Descriptive statistics were applied.

Results: Seven patients (2 females, 5 males, mean age 41.6 years) were included. All suffered severe lower extremity trauma and underwent bony fixation, and staged reconstruction with LD flaps, dermal matrices, and STSG (3:1)/ASCS. STSG graft take was 100% in all cases. No patients experienced complications. Average length of hospital stay was 31 days (range: 21-36). At the 6-month follow-up, patients displayed excellent functional outcomes, with durable overlying soft tissue and impressive repigmentation.

Conclusions: use of ASCS in conjunction with STSG and LD flaps for lower extremity trauma reconstruction mitigates donor site complications and can expedite wound healing and enhance repigmentation.

Speaker

Slava Agafonoff
Plastics & Reconstructive Surgery
Westchester Medical Center

10:45 AM

Use of a Novel Hemostatic Agent in Control of Traumatic Bleeding in Damage Control Surgery

10:45 AM - 11:00 AM, Feb 1
Pikake I & II
Technolo…

Traumatic injury has become commonplace in today's society. Better weaponry, along with high speed motor vehicle accidents/blunt trauma has allowed for significant morbidity and mortality in our trauma patients. Damage control surgery techniques have predominated management of such patients, but mortality remains high in the face of significant and severe acute hemorrhagic shock. Along with truncated operative techniques, hemostatic agents remain critical in assisting in control of such hemorrhage.

At present, blood product availability remains at an all-time low. Given this, alternatives to utilization of blood products remains critical to provide patients' opportunities for survival. In this study, we aim to demonstrate use of a novel hemostatic agent, in an off-label use in damage control surgery in abdominal trauma. The product, which is an etherfied cellulose product that is pH neutral, has great utility with severe topical bleeding. The product provides excellent hemorrhage control in patients with severe bleeding in burn surgery, while demonstrating and extreme safety profile.

In severe trauma, the patient who presents to the trauma bay in extremis has activation of mass transfusion protocols in the Emergency Department (ED) to allow for establishment of hemodynamic normality to provide an opportunity for movement to the operative theater. As the patients move from the ED to the operating room, mass transfusion continues through the operative intervention, which is truncated in damage control surgery to minimize operative time and blood loss. In many such instances, significant volumes of resuscitative fluids are administered, with crystalloid, PRBC's, FFP, platelets, and cryoprecipitate allow for third spacing of fluids along with loss of abdominal domain as hemorrhage control is achieved. In many instances, the abdominal cavities of such patients are managed with negative pressure wound therapy (NPWT) to attempt to control such loss of domain, and facilitate control of edema. The resuscitation then moves to the ICU setting, with continued utilization of blood products. The vicious cycle of continued bleeding, blood product utilization and further bleeding, along with an already cold and coagulopathic patient allows for the death of the patient in many instances.

In this study, we aim to control the initial source of bleeding during the operative intervention with the off-label use of a novel hemostatic agent. In achieving rapid hemorrhage control in the operative theater with the use of the novel product, this study has identified decreased intra-operative blood product utilization and decreased operative time, along with decreased post-operative blood product utilization. In the rapid control of such hemorrhage, and with the reduction of blood product utilization, the complications of loss of domain and subsequent inability to close the abdominal cavities of these patients was reduced. Moreover, overall blood product utilization was reduced during the pre/intra and post- operative periods, allowing for rapid return to the operating room for completion of the truncated operative interventions. Overall, this has allowed for rapid closure of patient abdomens, with reduction of ventilator days, ICU stay, and overall hospital LOS.

Speaker

Stathis Poulakidas
Director, Burn Surgery
Cook County Hospital/OSF Healthcare

11:00 AM

Safety of lower extremity salvage in the obese population

11:00 AM - 11:15 PM, Feb 1
Pikake I & II

Reconstructive/Pla…

Purpose: Lower extremity (LE) reconstruction following severe trauma, oncologic ablation or extensive chronic wounds implies many challenges for reconstructive surgeons. Despite previous, limited data regarding the impact of obesity on LE reconstruction is currently available.[1-3] Currently 39.1% of adults in Mississippi are obese, making it one of the most obese states in America.[4] Many of these patients have comorbidities and are subject to multiple chronic therapeutic interventions, providing a unique population in which to study obesity and other comorbidities and their potential effects on LE reconstruction and wound healing. The aim of this study was to examine patients who underwent surgical reconstruction of LE injuries at a single institution under the direction of a single surgeon and analyze possible trends in surgical methods, decision-making processes, and long-term outcomes. In addition, risk factors such as obesity and other comorbidities were analyzed to monitor their effects on the outcome of LE reconstructive procedures.

Methods: A retrospective review was performed on patients who underwent complex lower extremity salvage at a single institution under the direction of a single surgeon since September 2012. Records were reviewed for patient demographics, comorbidities, mechanisms of injury, and perioperative complications/characteristics. Patients were classified using the World Health Organization criteria for obesity. Rate of perioperative complications with high body mass index (BMI) vs normal BMI was the primary outcome; reoperations and limb salvage vs amputations were secondary outcomes.

Results: One hundred and one patients were included in this analysis. Mean age at surgery was 47.5 years. Average BMI was 31.6 kg/m ^{2} with 51% of patients classified as obese (BMI ≥ 30 kg/m^2). Mechanism of injury, operative characteristics, and types of flaps were similar between obese and non-obese patients. 11 patients ultimately required amputation, including 7 obese (7%) and 4 overweight (4%). The average number of comorbidities was not significantly higher in obese patients (1.25 vs. 0.98, p= 0.239), and no significant difference was seen in overall complication rates between obese and non-obese patients (p= 0.431).

Conclusions: Lower extremity salvage can present with many challenges; however, we demonstrate the safety of aggressive lower extremity reconstruction in the obese population. Obese patients, even those with higher numbers of comorbidities, can successfully undergo lower extremity reconstruction utilizing the same operative mechanisms as in healthy weight patients.

Speaker

Peter Arnold
Chief, Plastic and Reconstructive Surgery
The University of Mississippi Medical Center

11:15 AM

Our experience with fish skin grafts in severe burns – a clinical case series in connection with the military operations in Ukraine

11:15 AM - 11:30 AM, Feb 1
Pikake I & II

Skin Substit…

Speaker

Anna-Lisa Pignet
Medical University Graz

11:30 AM

Regeneration of the epidermis using autologous skin cell suspension: Review of pre-clinical evidence

11:30 AM - 11:36 AM, Feb 1
Pikake I & II

Skin Substit…

Background: The autologous cell harvesting device was developed to prepare a skin cell suspension (ASCS) using a small piece of the patient's own skin at the point of care. Clinical data demonstrates safety and effectiveness for the treatment of acute thermal burn injuries, full-thickness skin defects, as well as repigmentation of stable vitiligo lesions. This work reports on a collection of pre-clinical studies designed to highlight advanced cellular characteristics of ASCS as well as demonstrate evidence of regeneration of the epidermis including re-epithelialization, repigmentation, and basement membrane formation.

Methods: To evaluate advanced cellular characteristics ASCS was prepared using freshly discarded excised donor tissue. Cellular yields, apoptotic activity, aggregates, and advanced phenotyping were determined using various staining techniques and flow cytometry.

Two pre-clinical model systems were used to evaluate epidermal regeneration. In the first model (*in vitro*) a living dermal equivalent was seeded with ASCS and cultured over 21 days. Histology using specialized stains and antibodies was performed to evaluate epidermal and basement membrane formation, as well as proliferative and melanocyte localization. The second *in vivo* model evaluated healing outcomes when ASCS was applied in conjunction with a meshed split-thickness skin graft (mSTSG) in a porcine full-thickness excisional wound.

Results: On average over 2.5 million viable cells were harvested per cm ^{2} of skin (0.15-0.2mm). The majority of cells were non-aggregated (single cells) and non-apoptotic. Advanced phenotyping data indicates presence of activated and basal keratinocytes, both known to play a role in wound healing and epidermal regeneration.

In the living dermal equivalent *in vitro* model, epidermal regeneration was demonstrated with proper localization of basal keratinocytes and melanocytes at the dermal epidermal junction. Additionally, basement membrane composed of collagen VII was present. Visual assessment of constructs made using ASCS prepared from high Fitzpatrick skin types indicated repigmentation at 21 days.

Full-thickness wounds treated with ASCS+mSTSG in the porcine model successfully re-epithelialized, with a thin layer of epidermal cells present in the interstices of the expanded 3:1 mSTSG as early as 3 days post-wounding.

Conclusion: These pre-clinical models demonstrate the functionality of ASCS and ability to regenerate epidermal tissue when the appropriate environment and signaling cues are present.

Applicability of Research to Practice: This data provides scientific evidence supporting clinical results obtained when ASCS is used in conjunction with a mSTSG for the treatment of full-thickness wounds or independently when dermal components are present.

External Funding: AVITA Medical

Speaker

Katie Bush
Sr VP, Scientific & Medical Affairs
AVITA Medical

11:36 AM

A Case Series of Ovine Derived Extracellular Matrix for Enterocutaneous Fistulae Following Trauma

11:36 AM - 11:42 AM, Feb 1

Pikake I & II

Skin Substit…

Intro: The development of enterocutaneous fistulas after trauma laparotomies are not uncommon and pose a difficult problem. Management is difficult and options include temporary abdominal closure, negative pressure wound therapy (NPWT), fascial traction systems, and mesh assisted closure. Although there are many studies evaluating the superiority of one technique over another, there is no general consensus. Additionally, despite the modality of management, these wounds continue to cause high morbidity in this patient population and prolonged wound healing. The extracellular matrix (ECM) is an acellular component of all tissues that is rich in proteins and fibers. The components of the ECM directly affect many aspects of cell behavior including adhesion, proliferation, migration and overall survival. Previous studies suggest ovine derived ECM (OECM) grafts may be viable treatment options for various complex wounds. The goal of this study was to investigate the use of OECM in the treatment of abdominal wounds with enterocutaneous fistulas.

Methods: Patients with traumatic abdominal wounds were treated with OECM. Wounds were appropriately debrided and OECM was applied. Application consisted of small morsel particles and/or sheet grafts applied to the wound depending on the characteristics of the wound and at the discretion of the surgeon. A secondary dressing was applied and left on for a minimum of 7 days. Patients were followed at regular intervals to monitor progression of wound healing.

Results: Two patients were enrolled in the case series. One patient presented after a gunshot wound to the abdomen resulting in multiple intra-abdominal injuries requiring laparotomy and multiple bowel resections complicated by an enterocutaneous fistula (ECF). OECM was applied and patient was able to be discharged to a rehabilitation facility. Upon follow up, his wound was significantly healed. The second patient sustained multiple intra-abdominal injuries after being struck by a vehicle. The patient required laparotomy with bowel resection and subsequently developed an ECF. OECM was applied and at two week follow up the fistula was closed and the wound nearly healed.

Conclusion: This case series highlights the utilization of OECM to augment wound healing in patients with traumatic abdominal wounds and ECFs. Ovine derived ECM serves as an adjunct for difficult traumatic wounds such as ECFs with the ability to accelerate healing. This pilot study demonstrates the excellent results achieved with OECM in abdominal wounds. A future multi-center study is being planned.

Speaker

Sophia Trinh
Resident
Louisiana State University Health Sciences Center

11:42 AM

Management of the Abdominal Catastrophe with Decellularized Fish Dermis and Autologous Suspended-Cell Transplantation

11:42 AM - 11:48 AM, Feb 1

Pikake I & II

Skin Substit…

Introduction

Abdominal sepsis and the open abdomen area are a life-threatening and challenging condition that carries a high morbidity and mortality risk, such as the formation of entero-cutaneous fistulae. Current practice for initial management may consists of the use of polyglactin mesh or biologics to cover intra-abdominal content. Skin substitutes may enhance the development of an optimal wound bed for grafting and provide temporary wound coverage. Decellularized and lyophilized north Atlantic cod fish skin have been reported to have properties in the 4-stages of wound healing and have demonstrated successful wound granulation for chronic and acute wounds. Subsequent resurfacing with autologous split-thickness skin graft (STSG) and suspended skin cell transplantation (SSCT) may lead to faster and complete healing of the skin grafts with reduced donor sites. We describe a case series utilizing this technique for the management of abdominal sepsis, open abdomen, and loss of domain.

Methods

Multiple critically ill patients with numerous comorbidities presented in septic shock secondary to abdominal catastrophes requiring emergent damage control operations. Underlying etiology of their abdominal sepsis included necrotizing pancreatitis, retroperitoneal abscess, abdominal compartment syndrome, gastric perforation, colonic perforation, and iatrogenic small bowel injury. All of these cases resulted in open abdomen, loss of domain, and exposed underlying bowel and were treated with fish dermal graft (Kerecis) followed by RECELL autologous cell harvesting device (ACHD) (AVITA Medical).

Results

Xenograft integration and optimal granulation tissue was evidenced in >95% of the surface area as early as 5 days after the product application. This was considered ideal for resurfacing. Skin coverage with meshed STSG and SSCT revealed nearly 100% skin graft take and epithelization within 2 weeks. Significant, donor site reduction with no donor site morbidity.

Conclusion

Decellularized and lyophilized fish dermis provides excellent wound coverage and enhances the formation of an optimal wound bed for grafting. Subsequent autologous SSCT reduces time of healing with smaller donor sites and donor site morbidity. For abdominal sepsis, open abdomen, and loss of domain, this technique should be considered as an alternative and efficacious treatment option.

Speaker

Alfredo Cordova
Acute Care Surgeon
Sarasota Memorial Hospital

11:48 AM

Burns in diabetic patients at the severance hospital in Korea

11:48 AM - 11:54 AM, Feb 1

Pikake I & II

Msc./Economy/Basic S…

Burns in diabetic patients with neuropathy are particularly concerning because delayed recognition of the injury is one of the most critical reasons. Diabetic neuropathy can diminish the patient's ability to feel pain, heat, or cold properly, leading to a delayed response to a burn injury. This delayed awareness can result in a more severe burn, increased risk of infection, and potential complications, highlighting the utmost importance of vigilant monitoring and early intervention in diabetic burn cases.

This study investigated the incidence of burns as one of the causes of trauma in diabetic patients.

Using SCRAP, data spanning five years were collected from an Acute Care Center at a Korean university hospital, distinguishing between lower limb burn patients and those with diabetes. Patient records included demographic information, burn causes, time to hospital admission after injury, total body surface area (TBSA) affected by the burn, neuropathy, duration of diabetes, blood glucose management, smoking status, infections, comorbidities, amputations, and mortality.

According to the study results, among 342 burn patients at Severance Hospital over 5 years, 101 had lower limb burns, with only 13 diagnosed as diabetic burn patients. All 13 had diabetic neuropathy and vascular complications, and all underwent PTA. Out of the 12, one underwent below knee amputation, right (BK), one above knee amputation (AK), and the remaining 11 healed without amputation. All diabetic patients had type 2 diabetes. Among them, 54% were male, 46% were female, with an average age of 63.61 years. Eight patients were smokers, and all 13 had comorbidities. More than half of the patients had uncontrolled blood sugar levels, and there were no fatalities.

Speaker

Eunjin Han