Mini Talk| Trauma/Burn/Critical Care

Aortic Occlusion in the Operating Room: Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) vs. Open Aortic Clamping

Jason Hutzler MD
University of Texas Austin - Dell Medical School

Introduction/Background

The use of temporary aortic occlusion (AO) in the operating room is a potentially life-saving intervention that is designed to optimize perfusion to the heart and brain while hemorrhage is controlled within the abdomen itself. Traditionally, this maneuver was achieved during emergent laparotomy via supra-celiac aortic clamping. In recent years, however, the use of REBOA in the operating room for temporary aortic control prior to laparotomy has been introduced. We hypothesize that this newer practice may better avoid the fluctuations in hemodynamics known to occur with emergent entry into an abdominal cavity with uncontrolled bleeding.

Methods:

The American Association for the Surgery of Trauma (AAST) Aortic Occlusion for Resuscitation in Trauma and Acute Care Surgery (AORTA) database was used to identify patients undergoing Zone 1 REBOA or open abdominal aortic clamping in the operating room from January 2014 to January 2022. Demographics, injury characteristics, required procedures and outcomes were compared between the two groups using SPSS statistical software.

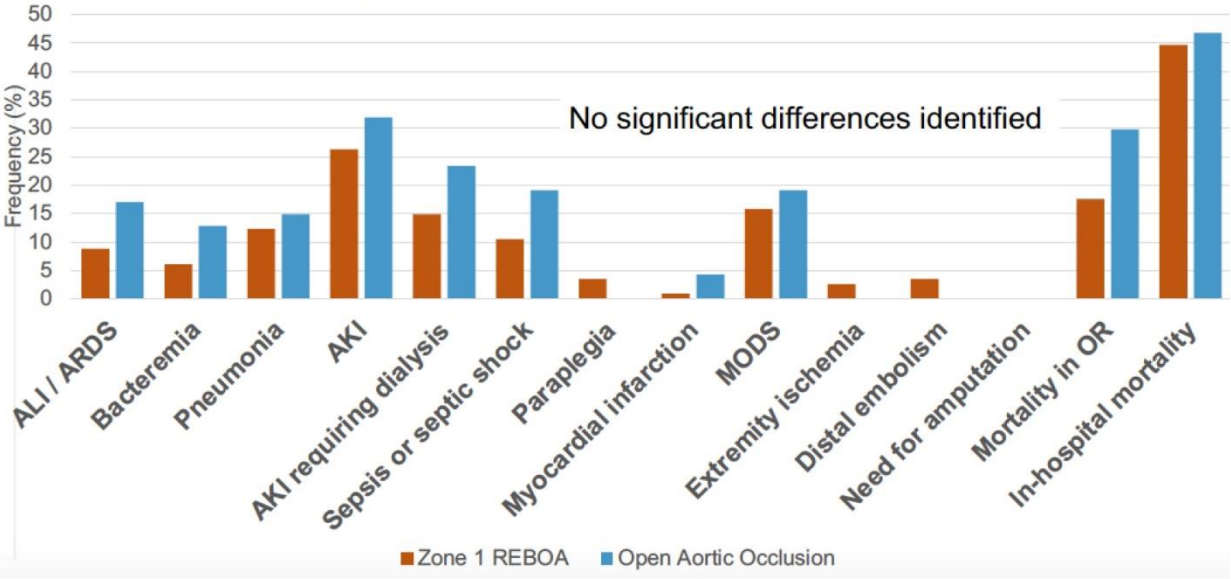
Results:

Over the study period, 161 AO meeting criteria were identified, with 114 Zone 1 REBOAs and 47 open AOs. Blunt mechanisms accounted for 50% of injuries, with a mean admission SBP of 94 mm Hg and a mean ISS of 33. In comparing REBOA to open AO, there were no differences in demographics, presentation physiology, overall injury severity or body region abbreviated injury scores (AIS). The overall mean SBP at time of AO was 73 mm Hg and did not vary between the two groups. Resuscitative requirements were not significantly different between REBOA and open abdominal AO and there was no difference in highest lactate, lowest hemoglobin or highest INR values. There were no significant differences in overall complications, lengths of stay or mortality (45% REBOA vs. 47% Open, $p = 0.797$). Patients undergo REBOA, however, were significantly more likely to have an observed improvement in hemodynamics with AO (86.8% vs. 74.5%, $p = 0.017$) and were more likely to achieve durable hemodynamic stability (77.2% vs. 53.2%, $p = 0.001$) than open occlusion counterparts.

Conclusion

At centers participating in the AAST AORTA database, Zone 1 REBOA is now used more commonly than traditional open abdominal aortic clamping after entry. REBOA appears to be comparable to open AO across most discernable outcomes but is superior to open clamping at improving initial hemodynamics and in supporting durable hemodynamic stability during attempts at definitive hemorrhage control.

Figure 1: Complications and Outcomes



Mini Talk| Trauma/Burn/Critical Care

Fluid Resuscitation in Burn Patients: a Retrospective Analysis on Methamphetamine's Role in Fluid Resuscitation

Cristian Dhaiti
Texas Tech University - Lubbock

Introduction/Background
Acute care specialists are faced by the dysregulated inflammatory cascade which require fluid resuscitation. Activation of 5-hydroxytrytpamine (5-HT) receptors have been associated with an increase in fluid extravasation. Methamphetamine (METH) is a class II stimulant that stimulates certain 5-HT receptors. METH-induced sensitization has shown upregulation of 5-HT2 receptors and increased release of 5-HT. We posit that these cases will require more intensive resuscitation given their increased serotonin levels.

Methods:
This was a retrospective cohort study of burn patients that were admitted at a major burn center from January 2011 to September 2021. The primary outcome was difference in crystalloid or colloid resuscitation between METH-positive and METH-negative patients. Study personnel compared fluid resuscitation in the first 24 hours since burn injury of METH-positive and METH-negative burn patients with a total burn surface area > 20%. Patients more than 24 hours removed from injury were excluded. Groups were further sequestered into total burn surface area quartiles. Fisher's test was conducted to confirm equal distribution of total burn surface area amongst total burn surface area quartiles. Statistical analysis was done via ANOVA.

Results:
A total of 167 patients were selected. 18 patients were METH-positive (Group 1; positive drug screen). 58 patients were METH-negative (Group 2; negative drug screen). 91 patients were excluded due to absence of a drug toxicity screen. Majority of patients in both groups were male and age was similar in both cohorts. Group 1 demonstrated higher average colloids administered than Group 2 (p=.001). Female patients also showed a statistically significant higher colloid resuscitation compared to their male counterparts (p=.05) When looking at specific quartiles of colloid resuscitation, 1st, 3rd, and 4th TBSA quartiles of Group 1 showed some significance when compared to Group 2 (p=.068, p=.085, p=.085).

Conclusion
Given the significance of increased colloid resuscitation for METH-positive patients compared to METH-negative patients, METH may play an indirect role in vascular permeability and fluid expulsion. This is important as colloids are utilized in later stages of resuscitation protocols, and burn specialists may need to consider the effects of METH when calculating for fluid resuscitation. Further research on METH's role on fluid imbalances may prove useful for treatment of trauma patients.

Mini Talk| Trauma/Burn/Critical Care

Geriatric Patients Have Worse Clinical Outcomes Following Emergency Trauma Laparotomy

Heather Kregel MD
Houston Methodist Hospital

Introduction/Background

Geriatric trauma patients (> 65 yo) are at elevated risk of postoperative complications despite equivalent injury severity scores (ISS) as younger patients. We hypothesized that geriatric patients who undergo emergency trauma laparotomy have worse clinical outcomes than younger patients.

Methods:

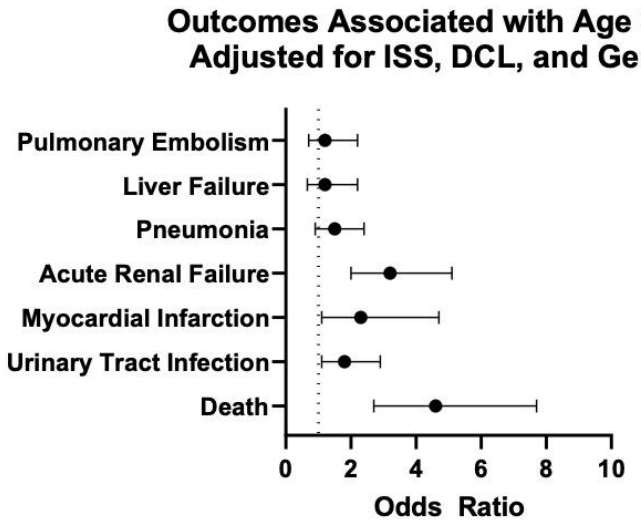
Adult patients who underwent either definitive or damage control emergency trauma laparotomy between 2011-2019 were included. Univariate and multivariable logistic regression analyses were adjusted for ISS, damage control laparotomy (DCL), and gender, to determine the association between age and clinical outcomes. Primary outcome was inpatient mortality. Secondary outcomes included: pneumonia, myocardial infarction (MI), pulmonary embolism (PE), urinary tract infection (UTI), liver failure, and acute renal failure (ARF).

Results:

Of 1800 eligible patients, 129 (7%) were geriatric. The cohort had a median ISS of 21 (IQR 12-34), and 56% had a blunt mechanism. Arrival Glasgow Coma Score and base deficit were similar between groups. Geriatric patients had lower arrival systolic blood pressures and underwent more DCLs. On adjusted analysis, age >65yo was associated with increased odds of death (OR: 4.6, CI: 2.7-7.7), UTI (OR 1.8, CI: 1.1-2.9), MI (OR: 2.3, CI: 1.1-4.7), and ARF (OR: 3.2, CI: 2.0-5.1). Although results were imprecise, age >65yo was also associated with higher adjusted odds of pneumonia (OR: 1.5, CI: 0.9-2.4), liver failure (OR: 1.2, CI: 0.66-2.2), and PE (OR: 1.2, CI: 0.7-2.2).

Conclusion

Geriatric patients have worse clinical outcomes than younger patients despite similar ISS. Further studies should focus on identification of modifiable risk factors to minimize mortality.



Mini Talk| Trauma/Burn/Critical Care

Weight Percentile And Intentional Burns In The Pediatric Population

Kathryn Keeney BS
Texas Tech University - Lubbock

Introduction/Background

It has been estimated that up to 15% of childhood injuries that result in emergency department visits are caused by abuse. There is limited data assessing the relationship of weight percentile and growth curve data to the incidence of intentional burn injury in pediatric patients. Failure to thrive, documented as inadequate weight gain over time, can be caused by neglect and undernutrition and can make it more difficult to recover from a burn. Physical abuse and failure to thrive can be concurrent, and some children are starved intentionally as a form of physical abuse. It is key that we identify all cases of intentional burns to prevent further abuse. If low weight is closely associated with the incidence of intentional injury, it will give health care providers an additional objective measurement to assess for abuse in contrast to the subjective assessments currently used.

Methods:

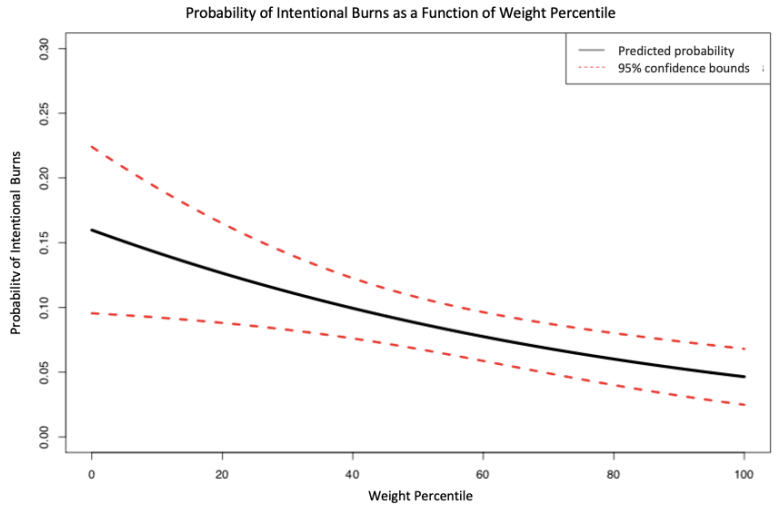
A retrospective database analysis included 830 burn patients ages 0-4 years seen at a singular burn center that covers 220,000 square miles between January 1, 2010 and November 15, 2021. Of the cohort, 69 patients had intentional burns and 761 patients had unintentional burns.

Results:

A logistic regression model fit identifies weight percentile as strongly associated with the risk of intentional injury (p=0.001). The results additionally reveal that the odds of intentional burns increase by 15% for each 10-percentile decrease in weight percentile. Thus, for a child of a lower weight percentile, the risk of having an intentional burn is significantly higher.

Conclusion

This gives health care providers another objective measure to screen for intentional burn in contrast to the subjective assessments currently used. Additionally, measuring an accurate weight upon hospital admission is essential to identify risk of intentional burn.



Mini Talk| Trauma/Burn/Critical Care

A Novel Link between Endotheliopathy of Trauma and Subsequent Thromboembolic Complications: A Multicenter Secondary Cohort Analysis

Kelly Sanders DO
University of Texas HSC - Houston

Introduction/Background

Venous thromboembolism (VTE) is a leading cause of morbidity amongst hospitalized patients recovering from major traumatic injuries. Endothelial cells are essential regulators of vascular anticoagulant tone. While dysregulation of the vascular endothelium is widely reported after polytrauma, the link between endothelial injury and subsequent VTE has not been reported.

Methods:

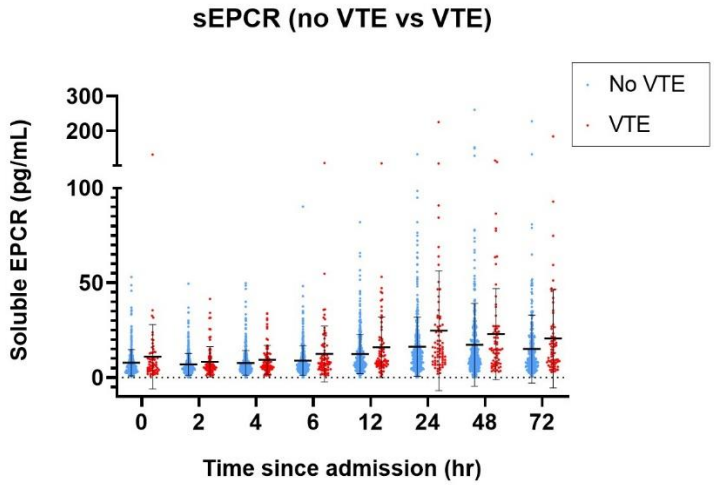
We conducted a secondary analysis of the multi-center Pragmatic Randomized Optimal Platelets and Plasma Ratios (PROPPR) study. Patients who died of hemorrhage were excluded. VTE was diagnosed by duplex ultrasound or computed tomography of the chest. Endothelial markers, including syndecan-1 (Sdc1), thrombomodulin (TM) and endothelial protein c receptor (EPCR) were measured by enzyme-linked immunosorbent assay. Comparison of marker values between VTE groups was evaluated at multiple time points in the first 72 hours using Mann-Whitney test. Logistic regression analysis was used to assess marker effects, controlling for age, gender, race, injury severity and randomization group.

Results:

Of 680 patients enrolled, 87 developed VTE (12.8%). The median time to VTE was 6 days (IQR 3, 13). No differences were identified in demographics, injury severity, or treatment group. However, VTE patients had significantly fewer hospital-free days [0 (0, 8) vs 4 (0, 18); p10.7 ng/mL were associated with an increased risk of VTE [OR 1.67, 95% CI (1.02, 2.72); p=0.04].

Conclusion

Endothelial injury is strongly associated with trauma-related VTE. These data indicate soluble EPCR could be a future biomarker of VTE risk and that therapeutics targeting endothelial injury and/or repair could mitigate the incidence of VTE following trauma.



Mini Talk| Trauma/Burn/Critical Care

The Role of Biodegradable Temporizing Matrix in Improving Graft Take and Prevention of Associated Skin Graft Complications.

Jake Wilemon MS
Texas Tech University - Lubbock

Introduction/Background

Biodegradable temporizing matrix (BTM) is a synthetic dermal substitute indicated for full thickness burns or necrotizing soft tissue infections (NSTI) that incorporates into the dermis to enhance the reconstruction of the deeper skin layers by providing a 3D scaffold. This allows blood vessel infiltration and fibroblast proliferation promoting dermal reconstruction and wound healing. With large burn injuries, the depth and extent of the burn decide if the patient requires surgery involving skin grafting. Deep partial thickness burns and full thickness burns damage most of or the entirety of the dermal layer of the skin. Loss of the dermal layer of the skin can lead to graft loss and potential infection. We examine the graft take of patients given BTM prior to their graft and the associated outcomes in these patients in this pilot study.

Methods:

A retrospective chart review of patients was obtained for 10 patients that received BTM placement for the treatment of their deep partial thickness burn, full thickness burn, or NSTI. A dataset of 10 patients who were treated for similar burn and NSTI injuries served as the control group in this study. The control group was also chosen to have similar ages, gender, BMI, comorbidities, and graft size as the BTM group. A T test was performed confirming that these two groups were similar in age and BMI. The two groups' graft take percentage reported from their first surgery was compared.

Results:

We used a standard our results showed that the patient group who received BTM had an average 91% graft take percentage compared to the control group’s average graft take percentage of 66%. These results were statistically significant ($P < .05$).

Conclusion

The use of BTM may be a beneficial adjunct to skin grafts as a treatment modality in full thickness burns. Its potential benefit in graft take and associated healing should be further examined in future large prospective studies.

Mini Talk| Trauma/Burn/Critical Care

Quality Improvement in Rib-Fracture Pain Management at Discharge - A TQIP Database Review

Carlos Chavez BS
University of Texas Medical Branch - Galveston

Introduction/Background

Rib fractures are found in up to 10% of trauma patients and are associated with high mortality rates, disabling pain, and diminished quality of life. Because of this, optimal management has been a focus of increased research. Our study aims to identify a potential discharge pain management regimen.

Methods:

A retrospective chart review was conducted using the Trauma Quality Improvement Program (TQIP) database. Patient demographic information and injury characteristics were collected for 140 patients who met the inclusion criteria. 70 patients had documented follow-up visits where data was collected at their visit after the initial admission and up to 90 days post-discharge. Patients were stratified according to their follow-up visit pain score, follow-up visit setting, reasoning, and pain management regimen. Pain management regimen was defined as a narcotic agent, Enhanced Recovery After Surgery (ERAS) medications, a combination of both, or neither. ERAS medications consisted of acetaminophen, NSAIDs, muscle relaxers, and/or nerve pain agents. Percentile scores were used to describe group compositions and ANOVA testing was used to compare group means.

Results:

The patient group that had a pain severity score of 0 on follow-up visitation demonstrated the largest percentage of patients with no rib-related complaints on their follow-up visit. Most of the patients in this group were on a narcotic with 3 ERAS medications (Table 1). The patient group with a pain severity score between 1-5 on follow-up visitation demonstrated the largest percentage of patients who had a rib-related complaint at their scheduled follow-up visit. Most patients in this group were on a narcotic with 2 ERAS medications (Table 1). The patient group with a pain severity score between 6-10 on follow-up visitation demonstrated the largest percentage of patients who had an unscheduled return visit to the emergency department (ED) due to ongoing rib-related complaints. Most patients in this group were on a narcotic alongside 2 ERAS medications and had the largest percent composition of patients on an ERAS-only regimen (Table 1).

Conclusion

Our observations suggest that neither narcotic nor ERAS medications alone are sufficient pain control methods. Patients on ERAS-only therapies demonstrated continued pain and the most unscheduled follow-up visits in the ED. Patients on combination therapies demonstrated improved levels of pain control with each additional ERAS medication supplementation. Most patients on a narcotic with 3 ERAS medications did not have any unscheduled follow-up visits or pain on return evaluation. Most patients on a narcotic with 2 ERAS medications or lower demonstrated higher return visits due to pain. The results hold promise as a potential best treatment regimen regarding pain management in isolated rib fracture patients. Further investigation can help elicit a pain management algorithm for isolated rib fracture patients.

Table 1: Pain Severity Score Groups with Associated Patient Populations and Percent Compositions

Pain Severity Groups	Pain Management Regimen at Discharge				
Pain Severity Score of 0 (N=42)	Narcotic Medication Alone	9%		Narcotic + 1 ERAS Medication	2%
	ERAS Medication(s) Alone	19%		Narcotic + 2 ERAS Medications	29%
	No Medications	10%		Narcotic + 3 ERAS Medications	31%
	Narcotic & ERAS Combination	62%		Narcotic + 4 ERAS Medications	0%
Pain Severity Score Between 1-5 (N=14)	Narcotic Medication Alone	7%		Narcotic + 1 ERAS Medication	14%
	ERAS Medication(s) Alone	7%		Narcotic + 2 ERAS Medications	50%
	No Medications	0%		Narcotic + 3 ERAS Medications	21%
	Narcotic & ERAS Combination	86%		Narcotic + 4 ERAS Medications	0%
Pain Severity Score Between 6-10 (N=14)	Narcotic Medication Alone	0%		Narcotic + 1 ERAS Medication	7%
	ERAS Medication(s) Alone	29%		Narcotic + 2 ERAS Medications	36%
	No Medications	7%		Narcotic + 3 ERAS Medications	14%
	Narcotic & ERAS Combination	64%		Narcotic + 4 ERAS Medications	7%

Mini Talk| Trauma/Burn/Critical Care

Earlier graft takedown using autologous keratinocyte suspension in conjunction with split thickness skin grafting for the treatment of deep 2nd and 3rd degree burns

Cristian Dhaiti
Texas Tech University - Lubbock

Introduction/Background

Autologous split-thickness skin grafts (STSG) have been the gold standard concerning treatment of both full and partial thickness burns. However, new treatments are emerging such as spray-on autologous keratinocyte suspensions (AKS). AKS is composed of a patient's own keratinocytes, fibroblasts, and melanocytes. STSG in conjunction with AKS has showed promising results for the treatment of deep partial and full thickness burns. The standard graft takedown with STSG has historically been on postoperative day (POD) 6. Once graft take down occurs, occupational therapy can begin along with cessation of continuous splinting leading to more convenience and comfortability for the patient. With AKS, we propose that faster wound healing allows graft take down to occur earlier on POD 4.

Methods:

A retrospective chart review was conducted at TTUHSC's UMC Burn Center looking at patients that underwent STSG with AKS for the treatment of their burn. Patients were divided based on graft takedown on POD 4 or 6. Factors such as time to complete wound closure and postoperative complications were analyzed.

Results:

The average age and total burn surface area in both groups was 43 years old and 28%. In the POD 4 group (n=10) the average time to healing was 2 months while the POD 6 group (n=21) had an average healing time of 3.1 months. Graft take and percentage of patients with changes in postoperative mobility and hypertrophic scarring were the same across both groups (98%, 30%, and 50%, respectively).

Conclusion

While time to healing was slightly different, there was not a statistically significant difference between the two groups. From this study we can conclude that graft take down can occur earlier in patients treated with STSG in conjunction with AKS. This allows for earlier therapeutic intervention and more convenience for the patient.

Burn and Treatment Information					
Location on Body (1=upper extremity, 2=lower extremity, 3=trunk, 4=face/neck)	Size of burn (%)	Total number of operations	Length of operation (hrs)	Harvest (1=dermatome, 2=amalgatome)	Area grafted (cm^2)

	Demographics				
Assigned ID Number	Age	Gender (1=male, 2=female)	Ethnicity (1=white, 2=African American, 3=Hispanic, 4=Asian, 5=other)	Length of Stay	Degree of Burn (1=mixed, 2=second degree, 3=3rd degree)

			Follow	Information			
Graft Take	POD Takedown	Complications (1=yes, 2=no)	Lost to follow-up (1=yes, 2=no)	Time for complete healing (months)	Hypertrophic scarring (1=yes, 2=no)	Graft failure (1=yes, 2=no)	Contracture (1=yes, 2=no)	Infection (1=yes, 2=no)

Mini Talk| Trauma/Burn/Critical Care

Hyperglycemia in Severe Burns is Associated with Adverse Outcomes and Hepatic Injury

Jana DeJesus MD
University of Texas Medical Branch - Galveston

Introduction/Background

Stress-related hyperglycemia in severe burn injury is associated with increased adverse outcomes. The process is mediated by a complex interplay of organ systems of which the liver plays a key role. Hepatic dysfunction – caused by stress hormone release, inflammation, and fatty infiltration – leads to insulin resistance, promoting hyperglycemia through gluconeogenesis and glycolysis. Additionally, hepatic protein synthesis becomes impaired in this process and has been recorded to remain dysfunctional for up to 12 months post injury. Limited understanding exists regarding the liver's role in postburn outcomes. This study aimed to identify if significant hyperglycemia (> 180mg/dL) within 24 hours of burn injury is associated with increased liver dysfunction and worsened patient outcomes.

Methods:

We performed a retrospective study of the TriNetX database from January 2011 – January 2021. The database was queried for pediatric patients (< 18 years old) who sustained a severe thermal or chemical burn injury (>20% TBSA). A total of 25,196 patients were returned. This cohort was queried for patients who developed hyperglycemia (> 180mg/dL) within the first 24 hours of burn injury, returning 578 patients. Propensity score matching was performed. Odds of adverse outcomes after injury were assessed. Markers of hepatic injury, hepatic synthetic function, and inflammation were trended at 24 hours, 7 days, 1 month, and 6 months. 1 year and 3 year markers were measured where data was available.

Results:

Patients with hyperglycemia within the first 24 hours following burn injury had a higher odds of pneumonia (OR 2.4, p 0.01), UTI (OR 2.1, p 0.04), and sepsis (OR 2.51, p 0.01) within 30 days of injury. They additionally had a higher odds of mortality (OR 2.1, p 0.04) within 6 months and developing DM II (OR 1.9, p 0.02) within 3 years.

In both groups, AST peaked at 24 hours following injury while ALT peaked at 7 days post-injury. AST and ALT remained elevated compared to baseline up to 3 years from burn injury. Patients with hyperglycemia within the first 24 hours after burn injury had higher AST and ALT levels across all time points. INR peaked at 7 days and returned to normal by 6 months. Albumin levels recovered to normal within 6 months after injury in both groups. No clinically significant change in bilirubin was noted across all time points.

Conclusion

Pediatric patients with severe burns who present with significant hyperglycemia within 24 hours of burn injury demonstrate elevations in markers of hepatic injury and hepatic synthetic dysfunction long after burn injury. They additionally have an increased odds of infection graft loss in the first 14 days of admission. Further study will be needed to understand the liver's role in postburn outcomes.

Mini Talk| Trauma/Burn/Critical Care

When Texas Froze Over: Response to a Mass Casualty Event in an Unexpected Location

Paul Comish MD
University of Texas Southwestern Medical Center

Introduction/Background

The state of Texas experienced an unprecedented winter storm in February 2021, which exposed vulnerable populations to devastating frostbite injuries. During this mass casualty event, Parkland Hospital treated a total of 41 patients for frostbite injury, many requiring surgical intervention.

Prior studies show high concordance of frostbite injury with psychiatric illness and lack of housing. Traditionally, frostbite management has followed a conservative approach with rewarming, wound care, and delayed amputation once tissue viability has demarcated. Newer protocols utilize imaging to delineate blood flow in affected tissues and determine amputation levels. Regardless of initial management, amputation is often the required definitive management.

Methods:

This is a retrospective study based on comprehensive chart review of patients treated for frostbite injury at Parkland Hospital between February and August 2021. The treatment algorithm was based on timing of injury and presentation. Patients who presented within 48 hours of injury were eligible for treatment with tissue plasminogen activator (tPA). Patients who did not meet criteria for receiving tPA, underwent local wound care and/or surgical intervention. Reflecting on this mass casualty event, we quantify multiple variables describing the overall management of frostbite injury, specifically in the context of comorbid conditions. Primarily, we aim to elucidate the difference in amputation rates for patients with and without stable housing, as well as patients with and without psychiatric illness.

Results:

Patients who were unhoused had a significantly higher digit amputation rate compared to those with stable housing (5.9 vs. 3.0 digits, $p = 0.05$). Patients with at least one psychiatric illness had similar amputation rates compared to those who had no known psychiatric illness (5.5 vs. 3.9 digits, $p = 0.32$). 71% of patients underwent amputation. Of patients receiving tPA, a total of 23 digits were threatened based on blood flow/SPECT imaging, with only seven digits ultimately amputated, accounting for a preservation rate of 69.5%.

Conclusion

Our retrospective review provides insight into the use of imaging-guided amputations, specifically in vulnerable populations. While unhoused patients were found to have a higher number of amputated digits compared to those who are not, we found no statistical difference in the number of amputated digits for patients who have a psychiatric illness. Future studies are necessary to further evaluate the correlation between these risk factors and severity of frostbite injury leading to amputation. Moreover, larger sample sizes and randomized controlled studies are needed to better ascertain the role of tPA and imaging modalities on limb preservation. By reflecting on our clinical management and institution's findings, we can better implement future strategies for similar crises with the goal to ultimately improve clinical practice in mass casualty events.

Mini Talk| Trauma/Burn/Critical Care

Impact of Alcohol and Methamphetamine Use on Burn Resuscitation

Connor Kenney MD
Brooke Army Medical Center

Introduction/Background

Mortality associated with burn injuries is declining with improved critical care, including resuscitation. However, patients admitted with concurrent substance use have increased risk of complications and poor outcomes. The impact of alcohol and methamphetamine use on acute burn resuscitation has been described in single center studies, however, has not been studied since implementation of computerized decision support for resuscitation. The purpose of this study was to evaluate resuscitation volumes for patients with alcohol and methamphetamine use within a large prospective observational trial at 5 major US burn centers.

Methods:

We performed an observational trial across five institutions with > 20% total body surface area (TBSA) burn, weighing >40kg that were resuscitated utilizing computerized decision support. Patients were evaluated based presence of alcohol, with a minimum blood alcohol level of 0.10, or positive methamphetamines on urine drug screen. Fluid volumes and urine output were examined over 48 hours and Wilcoxon Method was utilized to compare patient groups.

Results:

A total of 296 patients were analyzed. 37 (12.5%) were positive for methamphetamine use, 50 (16.9%) were positive for alcohol use, and 209 (70.1%) with negative for both. Patients positive for methamphetamine received a mean of 5.30 +/- 2.63 cc/kg/TBSA, patients positive for alcohol received a mean of 5.41 +/- 2.49 cc/kg/TBSA, and patients with neither received a mean 4.33 +/- 1.79 cc/kg/TBSA. Patients with methamphetamine or alcohol use had significantly higher fluid requirements than those who were negative for both substances. In the first 6 hours patients with alcohol use had significantly higher urinary output in comparison to patients with methamphetamine use which had similar output to patients negative for both substances.

Conclusion

This study demonstrated that patients with alcohol and methamphetamine use had statistically significantly larger fluid resuscitation requirements compared to patients without. The effects of alcohol as a diuretic align with previous literature. However, patients with methamphetamine lack the increased urinary output as a cause for their increased fluid requirements. Methamphetamine's neurologic and cardiovascular effects due to increased release of dopamine, serotonin, and norepinephrine are known. Further investigation is required to better understand the mechanism underlying the need for increased resuscitation after burn injury in patients positive for methamphetamines.

Mini Talk| Trauma/Burn/Critical Care

A Retrospective Study Evaluating the Role of Sunlight Exposure and Fenestration in Burn Surgical Complication Rates and Length of Stay

Akshay Raghuram BA
Texas Tech University Health Sciences Center - Lubbock

Introduction/Background

Positive post-surgical patient outcomes are influenced by a plethora of factors. Looking closely at how burn patients behave and cooperate while comparing those factors to the environment they were placed in will help us to better understand how natural sunlight or lack thereof affects patient outcomes. As indicated by previous studies, patients assigned to a dimly lit room showed a higher mortality rate than of those who resided in a brightly lit room. Improved mental state and willingness to keep up with postoperative regimens are imperative to a successful recovery in the burn unit. We hypothesize that patients with exposure to natural sunlight will yield more positive postoperative outcomes than those without sunlight exposure during their stay.

Methods:

A retrospective chart review was performed, looking at 200 patients in the burn intensive care unit over a six-year span that were treated either in rooms with natural light exposure or rooms without, to evaluate outcomes such as hospital length of stay (LOS), delirium, agitation, and mortality rates.

Results:

We examined 354 patients hospitalized in rooms either with exposure to natural sunlight or without exposure during their hospital stay (both groups were standardized). The univariate tests suggest that mortality and delirium have a relation with the hospital control at the 90% confidence interval (CI) [p = 0.0787 and 0.0838 respectively]. Additionally, agitation has a relationship with the hospital control at the 95% CI (p = 0.0388).

Conclusion

This study aims to evaluate the impact of natural light exposure on patient outcomes. The trends indicate that natural light exposure could shorten a patient's length of stay and prevent symptoms of agitation and delirium. Evaluating the therapeutic effect of exposure to natural sunlight in a patient's room sheds light on the variety of factors that determine a patient's disposition. This analysis allows providers to better understand how non-clinical measures participate in overall care.

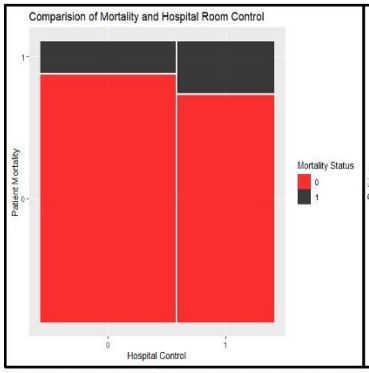


Figure 2: Comparison of Mortality with Hospital Room Control (exposure to natural sunlight)

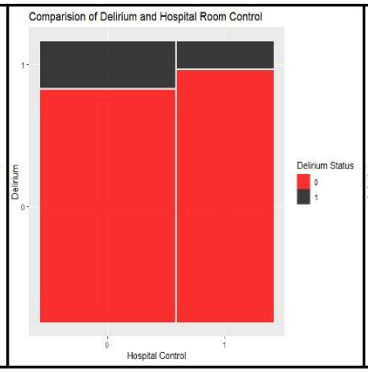


Figure 3: Comparison of Delirium with Hospital Room Control (exposure to natural sunlight)

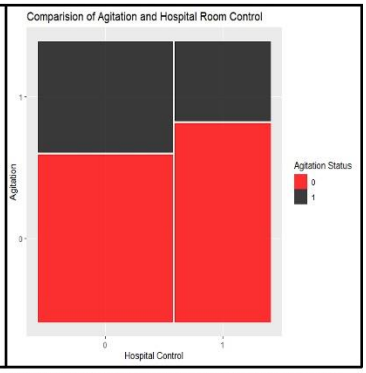


Figure 4: Comparison of Agitation with Hospital Room Control (exposure to natural sunlight)

Mini Talk| Trauma/Burn/Critical Care

More is Not Better: Increased Helicopter EMS Prehospital Interventions Do Not Improve Survival in Trauma Patients

James Bradford
University of Texas at Austin Dell

Introduction/Background

Helicopter EMS (HEMS) has been shown to reduce transport time when compared to ground EMS (GEMS), although it remains unclear if there is a survival benefit. The aim of this study is to compare treatment practices and outcomes between trauma patients transported by HEMS and GEMS.

Methods:

Retrospective chart review of adult patients transported by EMS to our ACS verified Level 1 trauma center from 2014-2020. Patients transported by HEMS were compared with patients transported by GEMS in univariate and multivariate analysis.

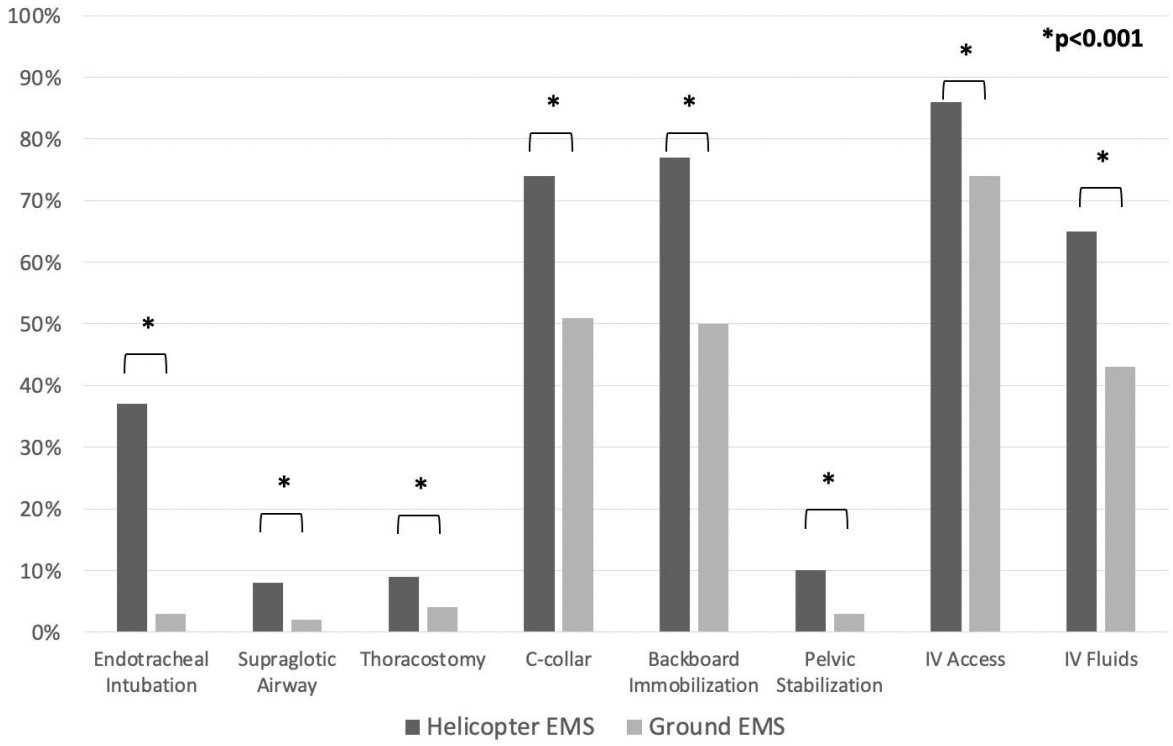
Results:

2,393 transports were included (79% GEMS, 21% HEMS). Patients transported by HEMS were older (44 vs. 41, p

Conclusion

HEMS transport is independently associated with more prehospital interventions but without a survival benefit in trauma patients. More work is needed to better refine indications for prehospital interventions in trauma patients.

Figure 1: Differences in Prehospital Interventions by Transport Method



Mini Talk| Trauma/Burn/Critical Care

Second-Degree v. Third-Degree Burn Differences in Length of Stay

Brandon Youssi BS
Texas Tech University - Lubbock

Introduction/Background

Length of stay (LOS) is a crucial element to patient care plans, hospital profit, and a patient's well-being. However, predicting LOS is difficult as burn injuries often have complications. The expectation for LOS in the burn ward is generally one day per percent of total body surface area (TBSA) burned. This prediction approximates the average but rarely represents true patient LOS. Healing times for second and third-degree burns differ, yet most studies only evaluate TBSA rather than 2nd and 3rd degree burns separately. We hypothesized that third-degree burns would have a longer LOS than same-sized second-degree burns.

Methods:

We obtained a list of all patients diagnosed with Second/Third-degree and verified the inclusion of patients meeting the study criteria from July 01, 2011, to July 01, 2021. Afterward, data was manually extracted from electronic health records and separated from patients with inhalation injury. We placed the aggregate findings in a 3D scatter plot to develop a predictive LOS formula.

Results:

The initial data set (n=678) decreased due to missing burn documentation and the exclusion of the inhalation injury group yielding the final data set (n=388). For every one percent second-degree burn increase, the LOS (in days) increases by 0.587 ± 0.057 (p=3.07E-22). For every third-degree burn percent increase, LOS increases by 1.328 ± 0.086 (p=1.4E-42). The intercept for the 3D scatter plot was set to 0 as a patient without burns or inhalation injury should have a LOS of 0. The r-squared value is 0.58 which shows a medium level of correlation. Our current equation: LOS = 0.587(2nd degree-burn)+1.328(3rd degree-burn).

Conclusion

The one-day per percent TBSA rule does not accurately predict LOS. Third-degree burn percentage may double the length of stay when compared to second-degree burns. More closely following 2nd vs. 3rd-degree burns and other comorbidities will give patients a more accurate estimate of their LOS.