

**[EP194] GAUZE IMPREGNATED WITH HYDROGELS TO TREAT RADIODERMITIS GRADE II AND III IN CANCER PATIENTS UNDERGOING RADIOTHERAPY**

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E-poster Session: Burns 2

**Aim:** The radiotherapy aims at destruction of tumor cells through DNA damaged by ionizing radiation. Even targeting neoplastic cells, healthy tissues with high mitotic rate, such as coating, epithelial cells are affected causing acute Radiodermatitis.

**Method:** Pilot study of prospective cohort prognosis with 15 patients with Radiodermatitis grades II and III using gauze impregnated with Hydrogel coverage on recovery of Radiodermatitis degrees II and III, according to RTOG classification (Radiation Therapy Oncology Group), secondary to radiation treatment as regards time of healing and pain relief. The patients were followed-up, guided and evaluated by nurses about the application of the visual scale of pain, vital signs and evolution of the lesion.

**Results / Discussion:** Of the 15 patients examined had pain relief in 92% in the early 12:0 am and 8% in up to 48 hours; 54% used painkillers in the early 12:0 am and 2% in 48 hours; 70% healed in 4 days, 15% (5), 10% (7) and 5% (8).

**Conclusion:** It concluded that there was a positive therapeutic response with significant reduction of pain, reduction of injuries in an average of six days and the number of interventions without compromising the safety of the treatment. Also stressed the importance of the intervention of the nurse in the care, education and therapeutic decision of these patients, opening precedent for a randomized clinical trial which is already in preparation.

## [EP195] NEGATIVE PRESSURE WOUND THERAPY FOR PARTIAL AND DEEP THICKNESS BURNS - A SINGLE INSTITUTION EXPERIENCE

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E-poster Session: Burns 2

**Aim:** In this report we assess the effectiveness of topical negative pressure wound therapy for those patients with partial and deep thickness burns.

**Method:** Topical negative pressure therapy has been developed to minimize burn wound progression to involve deeper tissue in the acute phase and promote the wound healing process. Negative pressure or TNP\* dressing uses a suction force to drain excess fluids and reduce oedema, provide an adequate protection against infection, increase blood flow promoting perfusion and provide a moist environment, promote cell migration and proliferation during granulation tissue formation and improves graft take in burns patients.

**Results / Discussion:** Patients with partial and deep thickness burns that do not require transfer to a burn unit, can be successfully treated with TNP\* dressing combined with excision procedures.

**Conclusion:** We describe a single institution experience with the TNP\* dressing used to manage partial and deep thickness burns. In this presentation we will demonstrate three results in use of the TNP\* dressing. First, use of the TNP\* dressing in the acute phase minimizing wound progression. Second, burn wound closure with combination of the TNP\* dressing and excision procedures and third, fixation of the graft with vacuum device especially in areas where it is difficult to successfully fix graft such is abdominal wall, with excellent results together with satisfaction of the patients.

\*Vacuum assisted closure (VAC)

## [EP196] DEVELOPING A PROTOCOL FOR BURNS IN A PRIVATE OUTPATIENT WOUND CLINIC

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E-poster Session: Burns 2

Our private clinic is small with a team of doctors with different specialities, physiotherapists and nurses as well as our own lab. We see all types of wounds, burns however, have always presented an extra challenge as they are painful and prone to infections.

**Aim:** To develop a protocol for burns treatment focusing on preventing infections, promoting faster healing and reducing pain.

**Method:** Ten burn patients were initially included. A dressing\* were used to achieve our set goals. Included were new injuries as well as stalled burns that had previously been treated with other dressings. Only the infected wounds were treated with silver versions of a dressing\*. Dressing changes were performed at the clinic every other day.

**Results / Discussion:** Pain scores according to VAS reduced by 2-3 levels within 24 hours. We also noticed exceptionally fast healing on the partial thickness burns, from a few days to several weeks faster than with previously used dressings. With deep wounds covered with eschar we also saw very fast improvement with the eschar dissolving into the dressing within days.

**Conclusion:** The initial evaluation gave such positive results that we have been using the dressing\* on all our burns the past 4.5 years. During this period we have noted that the scar tissue on the healed burns treated with the dressing\* is more elastic and pliable than we previously experienced. Many of our patients have been able to avoid grafting due to the accelerated healing results. Another result we have recently discovered while searching through our data for this presentation is the reduction of pain medication and antibiotic use since starting with the dressing\*.

\*Polymeric membrane dressings (PMDs)

## [EP197] THE TREATMENT OF BURN WOUNDS IN MOIST CONDITIONS

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E-poster Session: Burns 2

**Aim:** To investigate the effectiveness of second- and third-degree burns treatment in moist conditions.

**Method:** Clinical study of duration and results of thermal burn wounds treatment in the conditions of continuous presence in moist environment made of 0.9% sodium chloride. The solution was tested on protein presence, cell composition, microorganisms quantity during each solution replacement. The research of microcirculation in the burn wound was conducted every day by the means of laser Doppler flowmetry and thermal imaging techniques.

**Results / Discussion:** In accordance with Local Ethics Committee permission observation of 6 adult patients with thermic burn wounds of hands was conducted. The surface of burn wounds was 0.5 – 2% of the whole body surface. 5 patients had second-degree burns, 1 patient had third-degree burn. At hospitalization burn wounds were placed into 0.9% sodium chloride. In the course of the treatment burn wounds were constantly placed in sodium chloride with daily sodium refresh.

Total exposition for the second-degree burns patients was 3-6 days, for the third-degree patient – 14 days. At 6th day third-degree patient's weeping eschar was removed. The treatment in moist conditions ceased after wound epithelialization. All patients have almost no pain in the wound even during bandaging and eschar removal. The examination of microcirculation and thermal imaging research revealed positive dynamics.

**Conclusion:** Applying of moist conditions allows to treat second- and third-degree burn wounds painlessly.

**[EP198] REPAIR OF FULL THICKNESS ANTERIOR CHEST WALL DEFECT OF ELECTRIC BURN WITH MODIFIED “SANDWICH” LATISSIMUS DORSI FLAP**

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E-poster Session: Burns 2

A 14-year-old boy was injured by 10KV electric current, his anterior chest wall touched high voltage power lines. The patient was treated in a peripheral centre in the first five days for fluid resuscitation, and was treated with closed thoracostomy with under water drainage in the right pleural cavity, and his chest wall was opened for stopping bleeding of the lung by suturing. After these operations, the patient was intubated with trachea cannula for 5 days because of dyspnea. 5 days later, the patient showed relatively stable respiration. After extubation, the patient was sent to our hospital. The patient was operated in four stages , the opened chest wall was successfully closed with a modified “sandwich” latissimus dorsi flap, and the necrotized and lost upper sternum was reconstructed by free iliac bone transplantation.

Anterior chest wall provides protection for lungs, heart and great vessels in the thoracic cavity, aids in coordinating respiratory movements and lung expansion. Anterior chest wall defects of full thickness will affect the respiratory movement, and cause infection of parietal pleura and mediating, at the same time, the heart and big vessels lost the protection of chest wall. It is a life-threatening injury to the patient. To repair the chest wall of full thickness electric burn is a challenging task , here we reported a case that the opened chest wall was successfully repaired with a modified “sandwich” latissimus dorsa flap.

**Conclusion:**

Our modified flap has a lot of advantages. Firstly, it provides a vascularized myocutaneous flap to supply good blood supply to the injured wound. Secondly, the “sandwich” modification of this flap could prevent the broken bones from pricking the organs. Thirdly, the flap could reduce paradoxical respiration to some extent. In conclusion, the modified “sandwich” latissimus dorsi flap is one of the best choices for reconstructing wide and serious chest wall defect.

References not available in abstract book

**[EP199] EXPERIENCE IN MANAGING AN URBAN MASSIVE BURN INCIDENT: THE JULY 5TH, 2014 HANGZHOU BUS ATTACK**

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E-poster Session: Burns 2

**Aim: Background.** On July 5<sup>th</sup> 2014, a suicide terrorist set a crowded bus afire within the heart of Hangzhou, injuring 33 passengers. Among these, the 19 most severely burned adult patients were triaged to our center. This is a single center, descriptive manuscript recording the pre-hospital response and in-hospital treatment of these patients.

**Methods.** Information on the attack, on-scene rescue, and patient triage was collected from public media, governmental, and hospital reports. Information on patient injury and our in-hospital procedures were collected through a review of the emergency registry and patient records.

**Results.** Of the 80 passengers on the bus when the terrorist set it on fire by lighting a bottle of lacquer thinner, 33 were injured. The 19 most seriously injured adult victims (including the terrorist) were triaged to our hospital. The total burn surface area (TBSA) of these patients ranged 25-95%(mean  $48.3 \pm 2.08\%$ ). Two patients were TBSA >90% (92% and 95%) and eight patients were TBSA >60%. Nineteen cases of inhalation injury were diagnosed: three mild, eight moderate, and eight severe. Previous disaster planning drills facilitated a quick institutional response when the Hospital Emergency Incident Command System was activated. The emergency center performed 14 bedside escharotomies, 14 central vein catheter implantations, and one cardiac pulmonary resuscitation. In all, 131,000 ml of resuscitation fluid was infused within the first 24 hours and 111,000 ml within the second. A total of 160,230 ml of plasma and 4,100 ml of red blood cells were infused during the anti-shock stage. After the burn center was emptied and sterilized, all bus attack patients were concentrated in the burn ward and received burn-centered multidisciplinary care. The respiratory team conducted 121 bronchoscopies. Eighteen of the 19 patients stopped using ventilators without serious respiratory infection. A total of 89 operations were performed (53 in the first month, 25 in the next, 11 in the third) and the residual wound area decreased dramatically ( $48.3 \pm 2.08\%$  at arrival,  $10 \pm 12.79\%$  at day 30,  $2.84 \pm 5.82\%$  at day 60, and  $0.42 \pm 1.39\%$  at day 90). After 124 days of extensive therapy, all of the wounds healed, with 18 patients entering the rehabilitation stage. The terrorist, also the most seriously injured one (TBSA 95%), was transferred to police custody.

**Conclusion:** Adequate preparation, including planning and disaster drills, is invaluable for dealing with mass casualty events. Efficient and precise first rescue and triage can reduce

the rate of pre-hospital mortality; burn-centered multidisciplinary care as well as hospital-government cooperation helps reduce the in-hospital mortality. Still, lessons were learned that would further improve the readiness for future disasters.

**[EP200] THE REPAIR OF COMPLEX AND REFRACTORY ELECTRIC-BURNT WOUNDS ON THE NECK AND HEAD BY FREE FLAP**

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E-poster Session: Burns 2

**Aim:** To discuss how to choose the optimal approach of early repair of complex and refractory big electric-burnt wounds on the neck and head by free flap

**Methods:** 9 cases of grave electric-burnt wounds on the early stage were repaired by free flap transfer. 8 of them by latissimus dorsi flap, and one of them by anterolateral thigh flap. The area of the repair is from 10-16 × 12-20 cm.

**Result:** All of the cases were successful.

**Discussion:** Choosing free flap transfer to repair the larger area of the complex and refractory electric-burnt wounds is a clinically valuable way which cannot be replaced. That is not only the best way to close wounds as soon as possible and get the best recovery of the appearance and function but the premise of preventing the complications of electric-burnt wounds and saving the patients.

**[EP201] EFFECT OF LIPOPOLYSACCHARIDE ON THE BIOLOGICAL CHARACTERISTICS OF HUMAN SKIN FIBROBLASTS AND HYPERTROPHIC SCAR TISSUE FORMATION**

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E-poster Session: Burns 2

Burn injury-mediated destruction of the skin barrier normally induces microbial invasion, in turn leading to the development of systemic infection and occasional septic shock by the release of endotoxins. The objective of this work was to study the influence of lipopolysaccharide (LPS) on the biological characteristics of normal skin fibroblasts and to elucidate the influence of LPS in the initial stage of skin wound healing. Twenty patients with hypertrophic scar in proliferative stage were selected randomly and primary cultures were established from fibroblasts derived from their hypertrophic scar tissue and normal skin. Normal skin fibroblasts of passage 3 were stimulated with different concentrations of LPS. LPS stimulated the proliferation and collagen synthesis of fibroblasts within a certain extent of concentrations (0.005–0.5 ug/mL) ( $P < 0.05$ ), whereas at a concentration of 1 ug/mL inhibited the proliferation and collagen synthesis of fibroblasts ( $P < 0.05$ ). Collagen synthesis by normal skin fibroblasts after LPS stimulation mimicked those derived from hypertrophic scar tissue. LPS of 0.1 ug/mL had significant effect on normal skin fibroblasts—continuous passage of these fibroblasts resulted in ultrastructural pattern similar to fibroblasts derived from hypertrophic scar tissue, and the findings was substantiated by ematoxylin and eosin staining and immunohistochemistry detection of proliferation cell nuclear antigen, type I procollagen and  $\alpha$ -smooth muscle actin. Our results suggest that LPS might convert normal skin fibroblasts to hypertrophic scar tissue fibroblasts and participate in the formation of hypertrophic scar; hence, appropriate concentration of LPS may have no effect or be beneficial to skin wound healing, whereas excessive concentration of LPS may delay the time of wound healing.

## [EP202] ADIPOSE-DERIVED STROMAL VASCULAR FRACTION THERAPY FOR REFRACTORY WOUNDS

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E-poster Session: Burns 2

**Background:** To our knowledge refractory wounds have extremely challenging problems since many patients respond poorly to conventional treatment. Although, the effectiveness of adipose-derived stromal vascular fraction (SVF) on refractory wounds healing has been recently reported, the depth of these studies is limited. In this study, we further evaluated the effects of the alternative method using SVF in treating various causes of refractory wounds.

**Methods:** A total of 12 patients with refractory ulcers, including 14 wounds, were treated using SVF. Meanwhile, 20 patients (20 wounds) were treated only with conventional dressing in the control group. The wound healing including wound healing time, percentage of wound shrinkage, and efficiency of wound healing were compared on 4 weeks and 8 weeks after treatment, respectively.

**Results:** The results indicated that the group using SVF was superior to control group in terms of wound healing. The wound healing time (mean,  $39.54 \pm 18.84$  days) in the SVF-treated group significantly shortened compared with the time (mean,  $62.40 \pm 23.98$  days) in the control group ( $p < 0.05$ ). The percentage of wound shrinkage (mean,  $86.92 \pm 19.95$  %) and (mean,  $99.08 \pm 2.78$  %) were observed in the SVF-treated group after 4 weeks and 8 weeks, respectively, and the percentage (mean,  $55.50 \pm 25.86$  %) and (mean,  $87.75 \pm 15.68$  %) in control group ( $p < 0.05$ ). After 4 weeks, the efficiency of wound healing (92.30%) in the SVF-treated group significantly improved compared with the efficiency (50.00%) in the control group. After 8 weeks, the efficiency of wound healing in the SVF-treated group and the control group were 100%. No adverse event occurred in any process of treatment.

**Conclusions:** Compared with the traditional treatment methods, the application of SVF showed an evident improvement in refractory wound healing. The therapy using SVF may be a promising treatment for improving wound healing.

**[EP203] EXPERIMENTAL STUDY OF THE TREATMENT OF BURN WOUND WITH COMBINATION OF MILLIMETER OF WAVE, INFRARED RAY AND ULTRAVIOLET RAY**

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E-poster Session: Burns 2

**Aim:** To evaluate the efficacy of a combination of millimeter of wave, infrared ray and ultraviolet ray in burn wound treatment.

**Methods:** 120 Sprague-Dawley rats, weight 200g-250g, male and female, were divided randomly into four groups: millimeter of wave treatment (A) group, infrared ray treatment (B) group, ultraviolet ray treatment (C) group and a combination with millimeter of wave, infrared ray and ultraviolet ray treatment (D) group. After 14 days treatment, the skin and the blood vessel turn, the wound healing, bacterial count, histology biopsy of healing wound, hydroxyproline content, cellular DNA content and cell cycle were observed.

**Results:** In D group, comparing with any other groups, after 14 days treatment the wound healed faster ( $P < 0.05$ ). The hydroxyproline content increased; the analysis of cellular DNA content and cell cycle showed that the cellular proportion in S-phase was higher.

**Conclusion:** The combination of millimeter of wave, infrared ray and ultraviolet ray could promote remarkably the wound healing of deep partial thickness burn and seems to be more effective than either of them singly.