

tissue noted in the center of the lesion as well as a moderate serosanguinous exudates and osteomyelitic fluid and necrotic debris.

Treatment:

The lacerations were cleaned with normal saline, a highly absorbent wound filler* was applied to both wounds and a secondary dressing*** was added to secure the site. During the first five days, the secondary dressing*** was changed daily and the gel absorbed all exudate and was removed by irrigating site with saline solution. After this initial five day period, the serosanguinous exudate was greatly decreased, therefore, the patient was switched from the highly absorbent wound filler* to the amorphous gel** and dressing changes were made every 48 hours for six days.

Conclusion:

03/18/06 - There was marked improvement of the patient's condition. The lesion evolved favorably, with good border contraction, no sign of infection or exudate and the entire lesion was covered with smooth granulated tissue.



Photo 1



Photo 2



Photo 3

layers over the right scapula. Some granulation tissue in the center and borders are identified. Moderate amounts of serosanguinous fluid flow from the wound and the tissue surrounding the wound shows extensive damage and trauma. No overt signs of infection are identified at this time.

Treatment:

Cleaned wound with saline solution and a was applied and covered by a secondary dressing***. Dressings were changed daily for five days and the wound filler was removed along with slough matter by saline irrigation. After five days the exudative flow diminished and the highly absorbent wound filler* was switched to amorphous gel**. The dressings were then changed every 48 hours for 4 days.



Photo 1



Photo 2



Photo 3

Last evaluation

03/27/06 – Borders were smooth, depth of wound diminished to less than 0.6cm and cicatrization within 30 days was identified. No sign of infection or exudate. Placed on regular follow up.

Products used:

- * Gold Dust™
- ** Stimulen™ Collagen Amorphous Gel
- *** Elasto-Gel™ Glycerine Gel Sheet

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THE EXPERIENCE OF THE CENTRAL HOSPITAL OF THE MILITARY POLICE OF RIO DE JANEIRO, BRAZIL IN THEIR USE OF GEL-BASED BACTERIOSTATIC DRESSINGS IN PATIENTS WITH FIREARM WOUNDS

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Abstract

Since 1993, the Brazilian government has been waging a non-stop campaign against lawlessness. There has been a dramatic decrease in the number of homicides, kidnapping and other violent and political crimes over the past 10-15 years. One of the primary reasons for this significant drop in the crime rate is because of the stepped up efforts of the Brazilian Military Police to bring criminals (especially armed thugs and narcotraffickers) to justice. Unfortunately, this new found prosperity has come at a steep cost to the very forces assigned to maintain law and order. The Brazilian Military Police Force faces adversaries who are armed with the same type of, and sometimes even more deadly, weapons. When the Military Police go out to make an arrest or apprehend a criminal, it is not uncommon for one or more of the police to be injured by projectiles fired from high powered, high caliber weapons by their foes. These firearm injuries are very common in our hospital, can be quite complex and are often very difficult to heal, with many of the most extensive of the injuries found in our hospital setting, being caused by bullets fired from rifles. The wounds typically have extensive disruption of the skin, muscles, connective tissue and sometimes bone with concomitant infection and necrosis. This study of a highly absorbent wound filler*, amorphous modified collagen gel** and glycerine based gel sheet (secondary) dressings***, all with varying degrees of inherent bacteriostatic and fungistatic properties, was undertaken to determine if this new technology would significantly improve our patient responses. These dressings were evaluated on five patients with acute and chronic gunshot wounds (GSW) ranging from medial thigh to upper chest that did not heal using traditional treatment. The patients each had ambulatory accompaniment to the treatment and evaluation by highly specialized nurses team and ample photographic and clinical documentation was made. We conclude that the dressings are extremely easy to apply to wounds in any location, that tunneling wounds are treated equally well as planar wound, that the collagen in the amorphous gel combined with the glycerine-based sheet dressing and the highly absorbent wound filler can prevent bacterial colonization of the wounds or aid in reducing the wound bioburden. We also demonstrate the effectiveness of this new technology by showing the greatly reduced time to complete wound closure or by healing previously non-healing chronic wounds produced by firearm in our selected patient population.

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Case #5:

CC/PMH

30y/o male - Shot in the upper chest by a 7.62 mm projectile (FAL Rifle).

Initial treatment and stabilization was performed at a private hospital ICU.

Patient was then transferred to the Orthopedic section of the Military Police

Hospital for treatment of fracture to the right clavicle and lateral scapula.

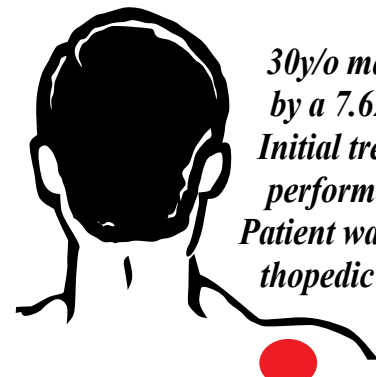
The bullet entered the right clavicle and exited through the right scapula. He spent 7 days at the Orthopedic section where surgical debridement was performed, bullet fragments removed and bones were fixated by plates and screws. He was then sent to the ambulatory care center for wound treatment.

Evaluations

(02/27/06, 03/09/06).

Physical Exam:

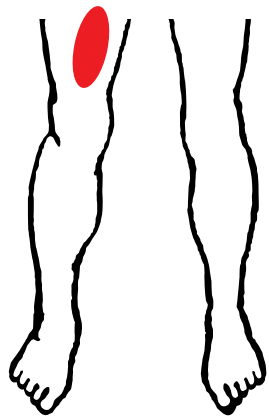
Irregularly shaped, exit wound laceration (5.1 x 4.4 x 4.4cm), with extensive damage to all muscle, epidermal and connective tissue and bony



THE EXPERIENCE OF THE CENTRAL HOSPITAL OF THE MILITARY POLICE OF RIO DE JANEIRO, BRAZIL IN THEIR USE OF GEL-BASED BACTERIOSTATIC DRESSINGS IN PATIENTS WITH FIREARM WOUNDS

Case #1:

Chief Complaint/ Past Medical History (CC/PMH) 1LT LCL - GSW of the right thigh, caused by a 5.65 mm AR-15 bullet. Spent 15 days at ICU at The Military Police Hospital in Rio de Janeiro. Transferred to ambulatory service for treatment of wound.



First Evaluation 11/12/05



Photo 1



Photo 2



Photo 3



Photo 4

Physical Exam:

Irregularly shaped, macerated laceration (25.4 x 17.8 x 4.4cm) of the medial right thigh, with extensive damage to all muscle, epidermal and connective tissue layers. Minimal amounts of granulation tissue identified in center and at the border of wound, along with some overtly collapsed tissue in the center of lesion. Moderate serosanguinous fluid, periwound eschar beginning to form. No infection is identified at this time.

Treatment:

Initial surgical debridement to remove necrotic debris and bullet fragments was performed. The laceration was cleaned, a paste of highly absorbent wound filler* mixed with physiological serum was placed over the wound and a secondary dressing was added to secure the site. The dressing was changed daily and the gel absorbed all exudate and was removed by irrigating site with saline solution for the first five days. After this initial five day period, the serosanguinous exudate was greatly decreased, so patient was switched from highly absorbent wound filler* to the amorphous gel**. Dressing changes of the secondary dressing*** were made every 48 hours. Photographs were taken twice weekly.

Second Evaluation 11/25/05

Physical Exam:

Improvement of lesion (20.3 x 10.2 x 2.5cm) was observed with excellent epithelialization, no maceration or excoriation, extensive granulation tissue formation, and significantly reduced amount of wound exudate. The borders of the laceration showed normal contracture.



Photo 5

Conclusion:

The dressings*** were changed every three days after the second evaluation with marked improvement of the patient's condition. At 30 days after receiving an extensive and severe GSW to the medial thigh, this patient was referred for an evaluation of a skin graft over this wound area.

Last picture: 12/16/05

Case #2:

CC/PMH

24y/o male – Sustained left hand GSW by a 9mm projectile (.380 ACP), spent 5 days under the care and supervision of the emergency department and orthopedic surgery section. After the initial debridement, application of antibiotics and placement of an external fixation device, he was sent to us for treatment of his lesion.



Evaluations

02/13/06, 02/22/06, 02/24/06

Physical Exam:

Irregularly shaped, macerated wound of top of left hand, with extensive damage to the skin, muscle, and connective tissue of the hand and fracture of three metacarpal bones. Entry wound found in the palm side of the hand where an external fixator was placed. Minimal amounts of granulation tissue identified in center of wound, along with moderate amount of yellow exudate. Periwound edema present.



Photo 1

Treatment:

Upon transfer to our service, the wound was cleansed with saline solution. Mechanical debridement was performed, a highly absorbent wound filler* was applied over the wound and a secondary dressing*** was added to secure

the site. Initially, the dressings were changed every 48 hours. Two additional dressing changes were made over the next 11 day period. Patient was discharged from service.

Conclusion:

03/03/06-Significant reduction in the flow of exudate was observed, along with border contraction and excellent epithelialization. After the depth of lesion diminished to 1.9cm, the patient was sent to surgery for graft of bone and skin.

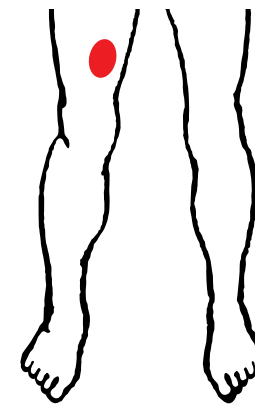


Photo 2

Case #3:

CC/PMH

28y/o Male - Shot in the right medial thigh by a 9mm projectile (.380 ACP). Bullet entered the inner side of the right thigh and exited through the right buttock. Patient was initially treated at the ICU Military Police Hospital and was transferred to our ambulatory service for treatment.



Evaluations

(20/03/06, 14/03/06/, 10/03/06).

Physical Exam:

Irregularly shaped, macerated exit wound laceration through the right buttock, with extensive damage to all muscle, epidermal and connective tissue layers, forming a rudimentary, coagulated blood-filled cavity. Some granulation tissue in the center and borders are identified. Copious amounts of serosanguinous fluid flow from the wound and the tissue surrounding the wound shows some crusting and excoriation. No overt signs infection are identified at this time.



Photo 1

Treatment:

The laceration was cleaned using saline solution, a highly absorbent wound filler* was applied directly to the wound and a secondary dressing*** was added to secure the site. The dressing was changed daily for five days. The gel absorbed all exudate and was removed, along with any necrotic debris by irrigating site with saline solution for the first five days. After this initial five day period, the flow of the serosanguinous exudate

was greatly decreased, therefore, the patient was switched from the highly absorbent wound filler* to the amorphous gel**. Dressing*** changes were made every 48 hours for six days. Photographs were taken.

Last evaluation

30/03/06-Wound beginning to close on both ends, no infection or exudate were identified. Brisk granulation tissue formation identified covering the entire wound surface. The patient was referred to a surgeon for closing.



Photo 2



Photo 3

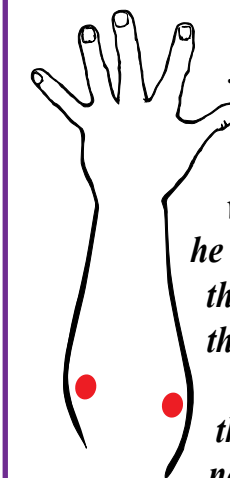


Photo 4

Case #4:

CC/PMH

32y/o male - GSW to left forearm (9mm projectile, .380 ACP short). During the 30 day period following the wound, at an outside facility for 30 days he developed osteomyelitis. The patient was then sent to the emergency department of the Central Hospital of the Military Police for stabilization, and transferred on to the orthopedic section where he spent the next five days. He was then transferred to our service for treatment of his lesion.



Evaluations

03/02/06, 03/12/06

Physical Exam:

Patient presented with two symmetrically placed wounds of the proximal portion of the medial and lateral aspects of the posterior left forearm with a tunneling wound in the tissues between them (5.1 x 4.4 x 1.9cm). The borders of each wound were irregular with moderate damage to the underlying connective tissues, muscle, bone and skin. There was a small amount of granulation