

Use of VAC System and Dermal Matrix as a Surgical Alternative for Lower Extremity Degloving Treatment

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Abstract

Case Report

Introduction: Soft tissue degloving injuries are the result of high-energy forces that produce compression, twisting or friction of tissues causing soft tissue avulsion, in which a large portion of skin and subcutaneous tissue is detached from the underlying fascia and muscles with musculocutaneous damage and perforating fasciocutaneous vessels. **Case Report:** The case of a 67-year-old female patient was reported, who as a result of a traffic accident (run over) suffered cutaneous loss (degloving) of the left lower limb. The patient underwent surgical cleaning with debridement of dead tissue plus full-thickness skin autograft for partial coverage of the exposed area in the proximal region. At the same time the surgery was performed, the VAC system was placed. After multiple surgical cleanings, scarce granulation tissue was revealed in the middle and distal third of the left leg. Therefore, it was decided to cover the exposed area with dermal matrix for later definitive coverage. The patient is being followed up by outpatient service. It is revealed that the patient already performs assisted mobility, and the grafts are assimilated. **Conclusions:** Traffic accidents are a major problem worldwide, especially those of high-energy may require multidisciplinary treatment, prolonged surgical time until recovery and return to daily activities. The initial treatment for degloving has to be performed by trained professionals since the criterion for assessing flap vitality is indispensable. When complex skin grafts are not an option, advanced wound treatment should be used, as in this case, where VAC therapy and permanent synthetic substitute were used for the total coverage of a major defect with lost dermal tissue.

Keywords: VAC system, dermal matrix, degloving.

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INTRODUCTION

Soft tissue degloving injuries are the result of high-energy forces that produce compression, twisting or friction of tissues causing soft tissue avulsion, in which a large portion of skin and subcutaneous tissue is detached from the underlying fascia and muscles with musculocutaneous damage and perforating fasciocutaneous vessels. These injuries can affect all parts of the body, but particularly the extremities, trunk, scalp, face and genitalia [1-3].

CASE REPORT

The following is a case report of a 67-year-old female patient with a history of hypertension and diabetes mellitus II, who as a result of a traffic accident (run over) suffered skin loss (degloving) in the left lower limb. The initial treatment was performed privately, where apparently dead tissue was removed. Upon arrival at our health center, a complete circumferential skin loss was revealed from the proximal third of the thigh to the distal third of the leg with exposure of the periosteum on the anterior part of the tibia and exposure of the tibioastragalar joint.



Figure 1: Left Lower Limb Degloving

The patient underwent surgical cleaning with debridement of dead tissue plus sartorius muscle repair. An internal gastrocnemius muscle flap plus full-thickness skin autograft was performed for partial coverage of the exposed area in the proximal region. At the same time the surgery was performed, the VAC system was placed. After multiple surgical cleanings,

scarce granulation tissue was revealed in the middle and distal third of the left leg. Due to the mechanism of the trauma and compromised microcirculation due to personal history of diabetes mellitus II, skin graft with free flaps was not considered suitable. For this reason, it was decided to cover the exposed area with dermal matrix for later definitive coverage.



Figure 2: Perioperative Treatment and Follow-Up

After 21 days of maintaining the dermal matrix and having an adequate evolution, skin coverage with split-thickness skin graft was performed.

The patient is being followed up by outpatient service. It is revealed that the patient already performs assisted mobility. Up to 95% of the grafts have been done. Small exposed areas have been maintained in treatment until complete epithelialization.



Figure 3: Postoperative Control and Follow-Up

DISCUSSION

Most of the literature on degloving wounds are focused on case reports where the traumatic mechanism of the injury and its topography are reported [4].

The reconstruction and coverage of a lower limb with significant skin loss involves a complex surgical decision, which may involve complicated microsurgical techniques using free flaps, muscle, composite or pediculated flaps, or a more conservative approach [5].

In recent years, a broad approach has been used for the resolution and coverage of important skin injuries. VAC or negative-pressure wound therapy is presented as a new therapeutic alternative for the treatment of acute or chronic wounds. It is a non-invasive, controlled treatment that uses negative pressure on the wound to promote healing in a moist and closed environment, favoring the elimination of excess fluid, stimulating angiogenesis and formation of granulation tissue and reducing bacterial colonization [6].

In some cases, it is not possible to treat the exposure of deep structures (tendons, bones, nerves, osteosynthesis material) with simple skin grafts. In addition, the possibility of making flaps is not always available, either because of the patient's clinical comorbidity or surgical history that contraindicates it.

Dermal substitutes have the ability to provide an adequate gliding plane in case of tendon exposure [7].

In this particular case, the coverage was carried out with a hybrid treatment using negative-pressure wound therapy in conjunction with dermal matrix placement and ending with split-thickness skin graft coverage with satisfactory results, return to daily activities and an acceptable functionality of the limb [8].

CONCLUSIONS

Traffic accidents are a major problem worldwide, especially those of high-energy may require multidisciplinary treatment, prolonged surgical time until recovery and return to daily activities. The initial treatment for degloving has to be performed by trained professionals since the criteria for assessing flap vitality, maintaining tissues as biological dressings or debriding of necrotic or mutilated tissue is indispensable. There is the possibility of using the debrided tissue as split-thickness or full-thickness donor skin.

When complex skin grafts are not an option, advanced wound treatment should be used, as in this case, where VAC therapy and permanent synthetic substitute were used for the total coverage of a major defect with lost dermal tissue.

Conflict of Interest: We, the authors, declare that we have no personal, financial, intellectual, economic, and corporate conflicts of interest.

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