CLOSING UNDER PRESSURE: MANAGEMENT OF FASCIOTOMY SURGICAL WOUNDS

Jonathan M. Thometz DPM*, AACFAS; Joseph D. Rundell, DPM*, AACFAS; Patrick A. McEneaney‡, DPM, FACFAS, AAPWCA;

Northern Illinois Foot and Ankle Specialists, Crystal Lake Illinois Northwest Illinois Foot and Ankle Fellowship Sycamore, Illinois*Attending Physician Northwest Illinois Foot and Ankle Fellowship;
Northern Illinois Foot and Ankle Specialists‡Fellowship Director, Northwest Illinois Foot and Ankle Fellowship; Founder and President, Northern Illinois Foot and Ankle Specialists

Statement of purpose

Acute compartment syndrome (ACS) is a limb threatening condition where the tissue pressure exceeds the venous outflow pressure ultimately leading to ischemia within the tissue compartment. If left untreated, then it can cause ischemic necrosis of the soft tissues as well as kidney injury secondary to rhabdomyolysis from myonecrosis. There are numerous documented causes of compartment syndrome such as trauma, burns, tight casting etc1.

Treatment for this condition is surgical fasciotomy of the affected compartments to allow for decompression of the compartment allowing restoration of tissue perfusion. Unfortunately, this procedure involves extensive incisions exposing muscle and deep structures. To further complicate matters, there are typically comprised soft tissues from extensive edema ,trauma and compromised perfusion. This combination of large incisions over compromised tissue can lead to impaired wound healing after this procedure.

Management of these wounds is sparsely described in literature. It is our hope by presenting this case we can further educate clinicians tasked with treating wounds of this nature.

Case Presentation

A 21 YO male with no PMH presented to the ED with complaint of severe foot pain after MVA. X-rays performed noted multiple metatarsal fractures and a talus fracture. Exam was noted for severely edematous foot, diffuse intractable pain and diminished sensation. ACS was suspected and confirmed using the wick catheter device.

Emergent fasciotomy of the foot was performed to decompress the soft tissue compartments. 2 incision were made, and deep blunt dissection was carried proximally to allow release of all compartments. No hematoma and active bleeding vessels were identified.

Treatment and Follow up

The patient went back to 3 days after the initial fasciotomy for wound closure and fixing of the fractures. This delayed approach was to allow for resolution of soft tissue edema. Given concern of soft tissue injury and residual edema these closures were reinforced with a piscine based graft (Kerecis).

The patient was discharged 2 days after the 2nd surgery and followed up in clinic. The wounds healed uneventfully in 2 weeks.

Clinical Evaluation

Figure 1: Initial polytrauma injury.

Figure 2a 2b: After the fasciotomy procedure. To obtain adequate compartment release extensile incisions leading to exposed muscle, tendon and bone are required.

Figure 3a: Skin substitute (Kerecis) applied to reinforce wound closure

Figure 3b: Fixation of the fractures done minimally invasive to minimize skin disruption.

Figure 4, Resolution of wounds with no complications.

Discussion

Management of wounds after a fasciotomy procedure are difficult given deep extensile incisions in the presence of soft tissue injury and edema. Delayed primary closure is often not possible in these cases; however, it is a consideration to mitigate complications from residual wounds.

There are many options to address these wounds ranging from simple saline wet to dry dressing therapy, grafting, gradual suture reapproximation, dermatotraction and NPWT assisted closure 2. In a meta-analysis by Jauregui et al 2 dynamic dermatotraction had the highest success of closure and NPWT had the lowest complication rate. Attention to controlling edema and optimizing the soft tissue envelope is key to successful management of this.

In this case the patient wanted as quick of a return to work so, it was decided to primarily close these incisions, however we did utilize a skin substitute to reinforce the incisions as these incisions were at high risk of breaking down.

It is our hope by presenting management of these difficult wounds from such an incident can lead further guidance to clinicians encountering this condition

References
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