Retrospective Review of Gunshot Injuries to the Foot & Ankle; A New Classification and Treatment Protocol

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Statement of Purpose

A thorough vascular examination should be performed including ankle brachial indices (ABI). Patients with abnormal ABI or impeding compartment syndromes, infection, or significant soft tissue injury should undergo emergent operative debridement and irrigation.

Procedures

Utilizing our institution’s electronic medical records (EMR), all trauma patients were reviewed for gunshot wounds to the foot and ankle. Inclusion criteria were gunshot wounds to the foot and ankle between the dates of 8/1/2010-11/1/2012. Some patients were treated operatively and some conservatively and were recorded in the EMR with the specific care administered noted. Days of hospitalization, length of stay, and complications were recorded. A retrospective review was then performed on isolated foot and/or ankle gunshot wounds, with an aim to review the pattern of foot & ankle gunshot injuries.

Methodology & Hypothesis

We believe that our proposed classification system administered and any post mortem cases of foot & ankle gunshot wounds were analyzed retrospectively. The pattern of foot & ankle gunshot injuries was evaluated and the influence of gunshot wounds to the foot and ankle between the dates of 8/1/2010-11/1/2012. We excluded patients presenting operatively or conservatively. A retrospective review was then performed on isolated foot and/or ankle gunshot wounds, with an aim to review the pattern of foot & ankle gunshot injuries.

Results

There were a total of twelve (12) patients who met our inclusion criteria that were treated for isolated gunshot wounds to the foot and ankle between the dates of 8/1/2010-11/1/2012. All patients were male, with a mean age of 42.3 years. The injuries were classified as low velocity gunshot wounds. Four patients (33.3%) presented with isolated digital injuries, three (25%) with concomitant fracture and one (8%) with a combined injury. In general, these injuries were categorized based upon vital structures that were in proximity to each location. The initial trauma survey is completed and life threatening injuries are appropriately addressed. Following initial assessment and stabilization with an external fixator will be performed to allow for recovery of the soft tissue envelope. After initial operative management has been performed, these injuries require the same team of foot surgeons performing the procedure.

Classification of Gunshot Injuries in Civilians

Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics. Our review yielded few complications, two patients presented with latent infection one of which responded to a short course of antibiotics.

Analysis & Discussion

The classification system proposed here is based on a primary anatomic location, degree of soft tissue compromise and 3) exposure (lacerations, contusions, compounding injuries, and superficial/ deep vascular injury). We propose a classification system based on 1) anatomic location, 2) degree of soft tissue compromise and 3) exposure (lacerations, contusions, compounding injuries, and superficial/ deep vascular injury).

Study of Purpose

After an initial trauma assessment has been completed and life threatening injuries addressed; the soft tissues should be inspected thoroughly and their size, depth and degree of contamination should be noted. Urgent surface cleaning and irrigation should be performed after fracture stabilization. After initial operative management has been performed, these injuries require the same team of foot surgeons performing the procedure.

Analysis & Discussion cont...

We believe that our proposed classification system administered and any post mortem cases of foot & ankle gunshot wounds were analyzed retrospectively. The pattern of foot & ankle gunshot injuries was evaluated and the influence of gunshot wounds to the foot and ankle between the dates of 8/1/2010-11/1/2012. We excluded patients presenting operatively or conservatively. A retrospective review was then performed on isolated foot and/or ankle gunshot wounds, with an aim to review the pattern of foot & ankle gunshot injuries.

References

Much of the literature related to gunshot wounds is adapted from high velocity projectile combat injuries, however most civilian gunshot wounds are from low velocity, small caliber firearms. A review of the literature revealed the importance of retropulsed tissue injuries. Sustained soft tissue injury may require delayed debridement and irrigation due to the delay in diagnosis and clinical suspicion. Soft tissues should be proactively assessed not only on presentation but at any time interval, particularly if the patient presents with signs of local ischemia and impending gangrene. Zone 2 injuries possess the potential to develop a latent compartment syndrome. This may be a potentially lifethreatening complication, and immediate decompression should be considered in this zone. Zone 3 injuries are not typically associated with a latent compartment syndrome. Zone 4 injuries are associated with a latent compartment syndrome.

Analysis & Discussion

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Table 1: Table of results

<table>
<thead>
<tr>
<th>Anatomic Location</th>
<th>Cases</th>
<th>Wound Type</th>
<th>Fracture</th>
<th>Contamination</th>
</tr>
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<tr>
<td>Zone 1</td>
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<td>Laceration</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Zone 2</td>
<td>4</td>
<td>Laceration</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Zone 3</td>
<td>3</td>
<td>Laceration</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Figure 1: Anatomic location diagram.