

Proposal for Lateral Malleolar Reconstruction in Fibula Loss Proximal to the Syndesmosis

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ABSTRACT

Background: High energy ankle injury can be devastating. Fibula loss proximal to the syndesmosis is a management challenge. The aim of this paper is to show that simple fusion of the floating lateral malleolus to the tibial plafond can restore the ankle mortice integrity.

Method: A case report of a patient that had spontaneous fusion of the lateral malleolus to the lateral tibial plafond after a high energy injury and subsequent sepsis.

Result: Uneventful union of the lateral malleolus to the lateral tibial plafond.

Conclusion: Ankle fusion, bone lengthening procedures are time consuming and costly. A simple fusion of the lateral malleolus to the tibial plafond will restore stability to the ankle joint.

KEYWORDS: Lateral malleolus; Reconstruction; Fibula loss.

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INTRODUCTION

High energy injuries to the ankle can result in devastating effects. Close range gunshot injuries to the ankle region poses added challenges including control of infections, soft tissue and bone loss, foreign body retention, to mention but a few^{1,2}.

Anatomically, the ankle joint is a hinge joint. The integrity and stability of the joint depends on the shape of the articulating bones (tibial plafond, medial and lateral malleoli and the talus). Other factors include the joint capsule, very strong medial and lateral ligaments, and the strong syndesmosis above the joint^{3,4}. The medial malleolus projects for about 1 cm, the lateral malleolus, 2 cm below the tibial plafond. More stability is produced by the lateral malleolus^{3,4}.

Radiologically, important views, in ankle injuries include the antero-posterior view (AP),

the lateral view and the mortice view i.e. with the foot and leg in 150-200 internal rotation³.

Important measurements include:

- Tibio fibular overlap (Figure 1). Normal range is 8-10 mm.
- Tibio fibular clear space, which is between the articulating surfaces of the tibia and fibula. If more than 5 mm is an index of syndesmotic injury.
- Superior and medial clear spaces which are equal. Values greater than 4 mm indicates a talar shift.
- In the mortice view, talar tilt normally zero with a range of $-1.5^{\circ} \pm 1.5^{\circ}$ can be assessed.
- Talo Crural angle made by the junction of the intermalleolar line and through the tibial plafond, ranges between 80-150³.

This report aims at relating a natural outcome without direct intervention, on a severely injured ankle joint; and to propose same as a treatment modality.

CASE REPORT

A 45 year old male patient, was referred to our facility, Rehoboth Specialist Hospital on 17.10.97 with a one day history of a close range low velocity gunshot injury to the left ankle. He was in stable clinical condition with a revised trauma score of 4 (BP = 150/70 mmHg, respiratory rate = 24/min, Glasgow Coma Scale = 15). There were blood stains all over his body, an open complex injury of the left ankle (Gustilo Type 3B), haemoglobin level of 9.8g/dl. X-ray investigation revealed multifragmentary fractures of the distal tibia and fibula and pellets lodged in the tissues.

Resuscitation was continued, wound debridement undertaken and an external fixator applied. There was subsequent severe wound sepsis with *staphylococcus aureus* and *coliforms* cultured at microbiology. Appropriate antibiotics and wound management were undertaken until stabilization of the wound was

achieved. On 8.2.98, an open reduction and plating of the distal tibia was undertaken. Nothing was done actively for the fibula and in particular the lateral malleolus since there was severe bone loss. The tibial fracture went on to heal very well and surprisingly the lateral malleolus spontaneously fused to the lateral edge of the tibial plafond (Figure 2). He mobilized with support until 4.2.2000, when the implants were removed. Before discharge after explantation, he was able to walk without support, albeit with a limp. He had an acceptable ankle joint stability. Figure 3a and b shows the patient's lower limb viewed from in front and behind. Figure 4 shows the radiograph after removal of the implant (4 years after).



Fig. 1. Lower tibia and fibula showing the triangle formed by the usual overlap.

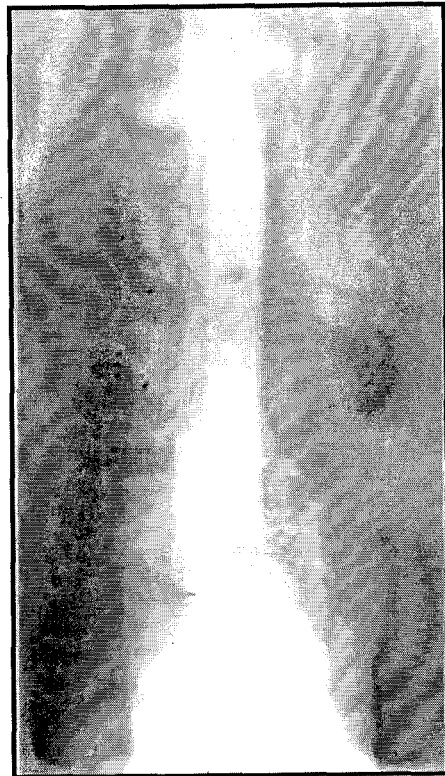


Fig. 2. Spontaneous Fusion of the Floating Lateral Malleolus. Note the severe fibula loss.



Fig. 3a. Patient's lower limb viewed from the front.



Fig. 3b. Patient's lower limb viewed from behind.

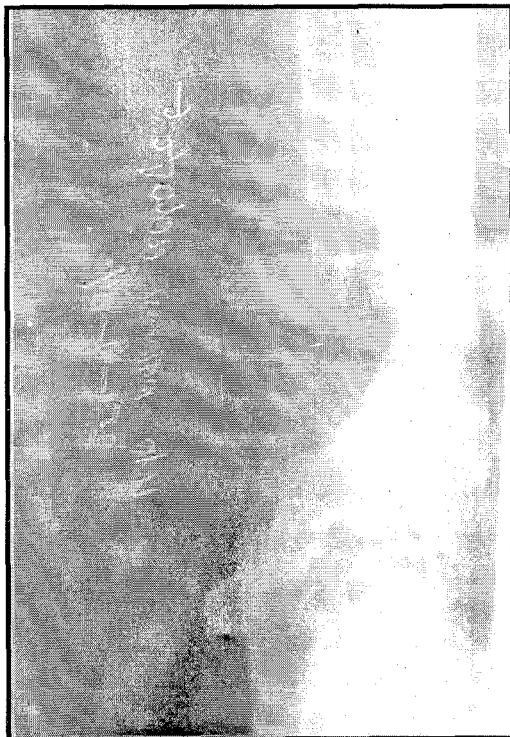


Fig. 4. Radiograph after removal of implant (4 years after).

DISCUSSION

High energy injuries are a worldwide concern^{1,2}. Gunshot injuries in our environment have been on the increase because of escalation in crime rate and communal crisis.

Reconstruction of the ankle, usually with plating of the lateral malleolus and screw or Kirschner – wiring on the medial malleolus is already an established practice⁵. In our experience we have not come across any literature that suggests a screw or K-wiring of the lateral malleolus, to the lateral edge of the tibial plafond. On the AP view, there is usually a triangle with an inferiorly placed base at the tibio fibula overlap, about the syndesmosis, (Figure 1). This makes part of the lateral plafond not directly involved with articulation with the superior surface of the talus. Screwing or wiring, a floating lateral malleolus to this lateral edge of the tibial plafond, having alignment and rotation in mind, might be an easier option to complex reconstruction in severe proximal fibula loss.

This proposal will be more in place where there is proximal fibula loss, just above the syndesmosis, intact lateral collateral ligament, and more so where lengthening procedures are difficult to come by. This procedure will restore both the integrity of the lateral malleolus, and the tibio-fibular syndesmosis.

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