

Case Report

Extra-articular distal tibia fibula fracture managed with single posterolateral approach: a case report

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ABSTRACT

Extra-articular distal tibia fractures involve distal tibia approximately 4 cm within tibia plafond with no articular extension. The proper preoperative care, planning and selection of surgical approach is very essential to prevent postoperative wound-related complications. We present a case of a 29 year female patient, presented with left ankle pain and swelling with a wound over the medial aspect of the ankle. X-ray of the left ankle showed extra-articular distal tibia fibula fracture with no neurovascular deficit. We managed both the fractures with open reduction and internal fixation using a single posterolateral approach. At present 1 year follow-up, the patient is having a good range of ankle motion with radiological union with no implant failure and wound-related complications. Extra-articular distal tibia fibula fracture fixation using single posterolateral approach is a viable alternative approach to medial or anterolateral approach in cases of medial or anterior soft tissue problems. It helps in getting a better functional outcome, early mobilisation with less wound-related complications.

Keywords: Distal tibia fracture, Extra-articular, Posterolateral approach, Plating

INTRODUCTION

Extra-articular distal tibia fractures involve distal tibia approximately 4 cm within tibia plafond with no articular extension. Metaphyseal bone here is thinner and central cortex is replaced by secondary spongiosa and cancellous bone making screw fixation more challenging in comparison with cortical bone.¹ Risk factors like peripheral vascular disease, smoking, diabetes and associated neuropathy, alcoholism, malnutrition and osteoporosis are all associated with increased chances of postoperative infection and non-union.¹ Open reduction and internal fixation with plating give an advantage of near anatomic reduction ensuring accurate alignment of fracture fragments under direct visualisation.¹ The treatment options available for the management of these fractures are, intramedullary nailing if adequate bone is

present distally to lock the bolts, medial and anterolateral plating.²

Harmon described the posterolateral approach to the distal tibia in 1945. It is usually used when soft tissue concerns preclude anterior or medial approach, as distal tibia fractures are usually caused by high energy trauma with associated complications of soft tissue injuries especially in the anterior or medial side of tibia.^{1,2} The complications like post-operative wound breakdown, skin necrosis and infection are more if operates through medial and anterolateral approach having soft tissue injury.³

We present a case of extra-articular distal tibia fibula fracture managed with a single posterolateral approach in a young female patient.

CASE REPORT

A 29-year-old female patient came with complaints of pain and swelling of left ankle since one day, and she had a history of a road traffic accident (fall from the bike) one day back. There was no history of trauma to other parts of the body. On local examination, the patient had severe swelling over the left ankle and foot, deep abrasion measuring 5×5 cm over the left medial malleolus with no distal neurovascular deficit. X-ray of the left ankle AP and lateral views revealed extra-articular distal tibia fibula fracture with no intraarticular extension (Figure 1). We initially managed with an above-knee slab for immobilization, strict limb elevation, active toe movements and oral antibiotics. The initial plan of management was to do medial plating for distal tibia fracture using MIPPO and lateral plating for fibula fracture once the swelling and soft tissue become normal. After 2 weeks of trauma, swelling reduced but abrasion did not heal completely. So, to prevent future wound-related complications, we decided to fix both tibia and fibula fracture using the single posterolateral approach.



Figure 1: Preoperative ankle X-ray showing extra-articular distal tibia fibula fracture.



Figure 2: Intra operative picture showing posterior plating for distal tibia fibula fracture using single posterolateral approach.

The patient was operated in a prone position under spinal anaesthesia using a tourniquet. The incision was taken midway between the posterior border of the fibula and lateral border of the Achilles tendon. The inter nervous plane lies between peroneus brevis muscle and flexor hallucis longus. Initially, the fibula was reduced and fixed with the one-third tubular plate to maintain length and rotation, then the distal tibia was reduced and fixed with T plate (Figure 2) and the wound was closed in layers. The postoperative X-ray showed good alignment of fracture (Figure 3). At present, one-year follow-up the patient is having a good range of ankle motion (Figure 4) with the complete union of the fracture without any implant failure (Figure 5).

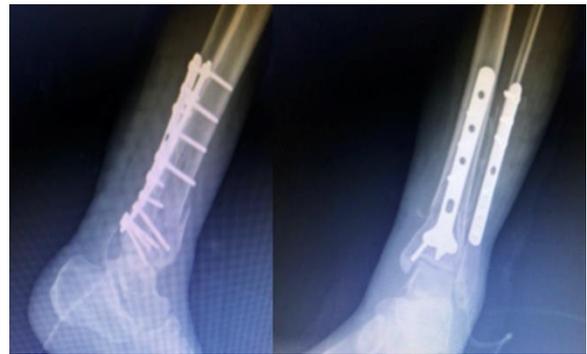


Figure 3: Immediate post-operative X-ray showing posterior plating for tibia and fibula.



Figure 4: Follow-up X-ray showing bony union with no implant failure.



Figure 5: Functional outcome at 1-year follow-up.

DISCUSSION

Distal tibia fibula fractures are usually high energy injuries, which requires proper preoperative assessment concerning the swelling, skin condition which helps in planning the management. Distal tibia fracture fixation can be difficult and require careful preoperative planning. Fracture pattern, soft tissue and bone quality critically influence the selection of fixation technique.⁴ Extensive soft tissue damage and severe comminution of bone are common complications in high energy distal tibia or pilon fractures.⁵

Fixation of the distal tibia using intramedullary nail requires an adequate length of the tibia for locking bolt fixation for the stability.² In our case there was no adequate length for bolt fixation, so we managed with open reduction and internal fixation using a plate. Medial approach to the distal tibia using open/MIPPO is one of the options for the management of these type of fractures, but it requires good soft tissue condition preoperatively to prevent future wound-related complications. As our patient had deep abrasion over the medial aspect of the left ankle, we did not approach through this region. Anterolateral approach to the distal tibia is very useful in cases of tibial plafond fractures, which helps in reducing multiple intraarticular fragments and approaching the fibula fracture through the same approach is very difficult. Use of separate lateral approach for the fixation of the fibula along with an anterolateral approach for tibia can lead to wound-related complications. Use of anterolateral approach for tibia and posterolateral approach for fibula is cumbersome as a change of the patient position is required intraoperatively for the better visualization. So, we preferred single posterolateral approach for the fixation of both tibia and fibula fractures simultaneously.

The posterolateral approach has many advantages. Firstly, the reduction and fixation of both fibula and tibia can be performed using only one surgical incision. Secondly, the bulk of flexor hallucis longus muscle is located above posterior tibia, acting as a cushion between tibia and skin with subcutaneous tissue, which minimises the incidence of wound complications and irritation from hardware compared with an anterior or medial approach.⁵ Fractures with significant displacement are difficult to reduce closed and require open reduction to ensure adequate reduction. The posterolateral approach also provides excellent visualization of posterior malleolar fragments and direct application of plates for reduction and stabilisation.⁶ The posterolateral approach avoids compromised anterior and medial soft tissue bulk with a reliable ability to restore stable anatomical alignment and also provides an option for bone grafting.^{2,7}

Disadvantages include limited visualization of the articular surface and an increased learning curve of operating with the patient in the prone position. It cannot be done for anterior comminution as anatomic reduction is difficult. The sural nerve is at greater risk.¹

CONCLUSION

Extra-articular distal tibia fibula fracture fixation using single posterolateral approach is a viable alternative approach to medial or anterolateral approach in cases of medial or anterior soft tissue problems. It helps in getting a better functional outcome, early mobilization with less wound-related complications.

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