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SUPRACUTANEOUS LOCKING COMPRESSION PLATE FOR TYPE I & II COMPOUND FRACTURE IN DISTAL THIRD TIBIA FRACTURES

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ABSTRACT

Based on reported success treatment of distal tibial fractures, we used Supracutaneous locking compression plate, in Type I & II compound fracture in Distal Third Tibia Fracture. We prospectively assessed the outcome of open distal tibial fractures treated with, this method. From March 2013 through September 2014, 10 patients who sustained open distal tibial fractures were treated by Supracutaneous locking compression plate. Treatment consisted of low-profile, locking plates for external fixation after debridement and anatomic reduction, Followed by soft tissue reconstruction, where ever neaded, using minimally invasive percutaneous osteosynthesis. All fractures were followed periodically for 18 months.

KEYWORD: Supracutaneous, osteosynthesis, tibia Fracture.

INTRODUCTION

In open distal tibial fracture, several authors have demonstrated the benefits of bridging external fixation followed by definitive internal fixation once the soft tissue has healed sufficiently.[5,14,17]

Low-profile external fixation without ankle spanning is a helpful adjunct in these fractures, as part of a staged reconstruction.[1] A locking plate, such as the less invasive stabilization system (LISS) plate, is also a good candidate for external plate fixation[6]. Based on the success with staged management of distal tibial fractures[1].We designed a 2-stage protocol for open type II and type III distal tibia fractures [3].

We retrospectively evaluated the outcome of using the locked plate as a temporary external fixator for type I and type II open, distal tibial fractures with regard to soft tissue reconstruction, followed by definitive percutaneous fixation.

Methodology

All patients were admitted for definitive fixation, all patients were treated within 24hrs to 48 hrs of admission. 3 patients had only wound repair, After immediate irrigation and debridement, in unstable patients the fracture was stabilized, Reduction was done through the wound, with a short extended incision if needed for access. [Fig.1].Limited intraarticular fragment fixation was performed using 3.5-mm screws. If necessary, fibular fixation was performed percutaneously with pins, cannulated screws, or plate, using minimally invasive percutaneous osteosynthesis with distal tibial/metaphyseal plates (Synthes, Paoli, PA)

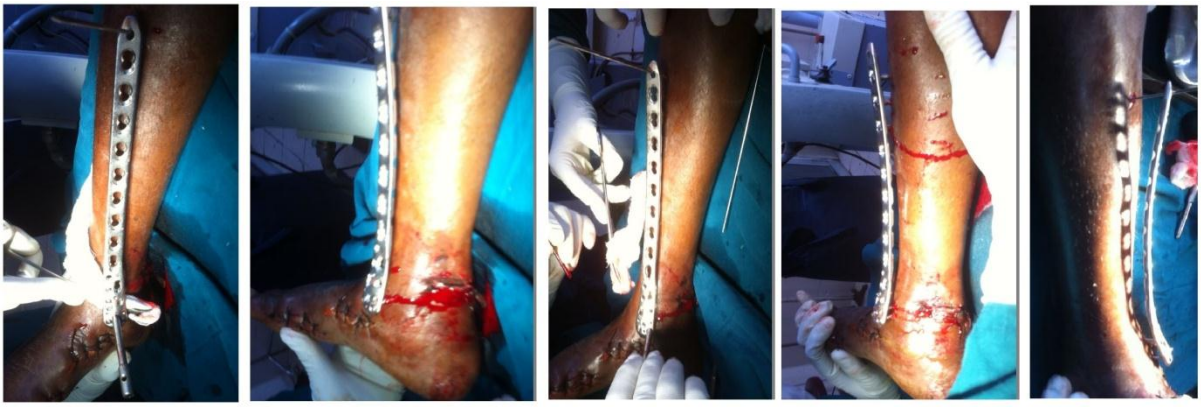

Fig: 1. Application of supracutaneous LCP.

The locked plate was placed on the opposite side of the wound, so as not to interfere with the soft tissue reconstruction to follow. Bicortical fixation was used.

Clinical assessment

The Iowa ankle questionnaire[9], was answered at 1 year and at the final follow-up. This clinical rating system has separate scores for pain and function. A score of 85–100 represents

an excellent result, 70–84 a good result, 60–69 a fair result, and less than 60 a poor result.[Fig.2]

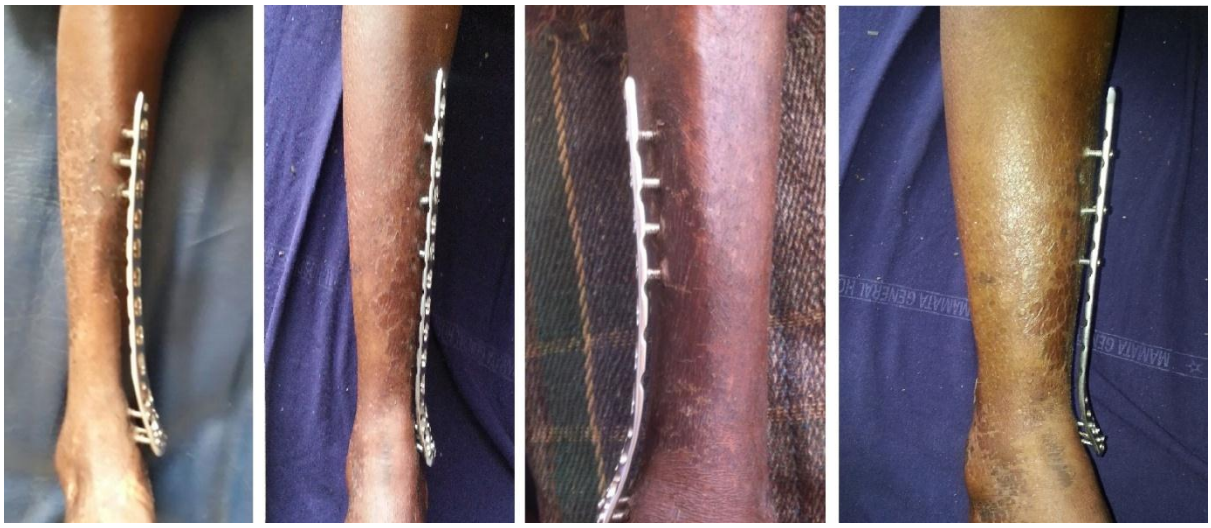

Fig: 2. After 6 months follow up

Radiographic assessment

Reduction of the articular surface was classified according to the modified Burwell and Charnley system [8]. In the extraarticular fractures, displacement was classified as excellent (< 2 mm), good (< 5 mm), fair (< 10 mm) and poor (≥ 10 mm). The Johnson angle was measured in both planes [11]. More than 5 degrees deviation was defined as malunion. We defined union as more than 50% visible bridging callus across the fracture on conventional radiographs [12]. At final follow-up, any ankle arthrosis was radiographically graded [8]. Clinical and radiographic follow-up examinations were performed at 3 months, 6 months, 1 year, and at 2 years in 7 patients, and at 18 months in 1 patient.

The median hospital stay was 14 (14–24) days; it was 14 days for patients who had orthopedic injuries only and 24 days for those who had other injuries.

Clinical outcome

At final follow-up, the median Iowa ankle score was 83 (73–89). 7 patients had excellent scores and 9 had good scores. Mean ankle motion ranged from 10 (5–20) degrees of dorsiflexion to 40 (20–60) degrees of plantar flexion.

Radiographic outcome

10 patients had good articular or fracture reduction. 1 patient had fair articular reduction. At the final follow-up, 1 patient had 5 degrees of angulation. 7 patients had grade 1 ankle

arthrosis and 2 patients had grade 2 ankle arthrosis. All fractures had united at a median of 6 (6–9) months.[fig3]

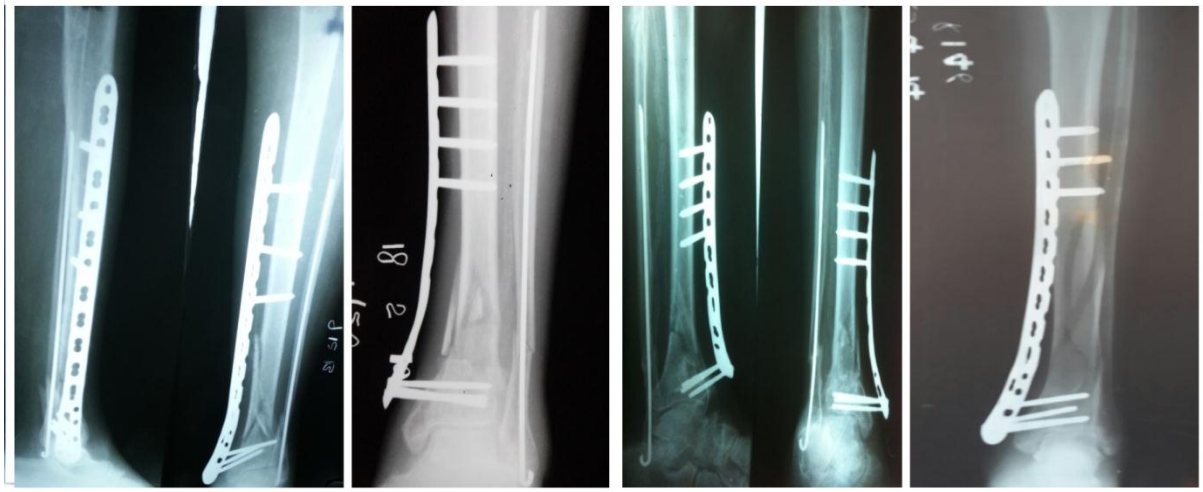

Fig.3. Radiographic outcome of some cases.

RESULTS

The reduction was classified as being good in 8 patients and fair in 2 patient. All fractures united at a median of 6 (6–9) months. At the latest follow-up, 7 patients had excellent and 3 had good Iow ankle scores; ankle motion ranged from a median of 10 (5–20) degrees of dorsiflexion to 40 (20–60) degrees of plantar flexion.

We believe that the supracutaneous locking plate technique is an effective procedure for treatment of open distal tibial fractures in patients who need a long period of external fixation. We achieved good reduction with immediate ankle-sparing stable fixation. Soft tissue reconstruction where ever necessary, led to union of all fractures with good function.

Complications

Postoperative complications included minor screw track infections in 1 patient, which resolved with oral antibiotic treatment and care of screw sites. There was no loosening of external fixators due to screw track infection. 1 patients had superficial infections that resolved with parenteral antibiotic treatment. No deep infections.

DISCUSSION

In our study we feel that, Supra cutaneous LCP Is one of the treatment of distal tibial fractures. As compare to one is the ankle-sparing system, a hybrid of the unilateral frame and the Ilizarov system, and the other is the ankle-spanning system, a unilateral frame with pins in the medial tibial shaft and the talus and calcaneus.

An Ilizarov-type device maintains the reduction of fractures, eliminates the need for implanted hardware, and provides a stable platform for soft tissue reconstruction [2]. The main disadvantage of the Ilizarov method is the long treatment time.

We achieved a high rate of anatomic reduction of the ankle joint and fracture site by reduction through the open wound or a short extended incision. Since the locked plate provided enough stability and did not cross the ankle joint, rehabilitation could be started early. The total duration of hospitalization was relatively short. Replacement of temporary external fixators with definitive supracutaneous LCP was fast and easy, after the reduction is confirmed .

The use of locked plates as temporary external fixators is not a generally acknowledged technique, and there is little experience with it in the literature. We found a high rate of union with a low complication rate when using staged external and internal locked plating for open distal tibial fractures.

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