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A Contraction of the contraction	Original Research Paper Orthopaedics
	DISTAL TIBIAL FIBULA MALUNION WITH ANGULAR DEFORMITY MANAGED WITH CORRECTIVE OSTEOTOMY WITH PLATING FIXATION IN A 50-YEAR MALE - CASE REPORT AND REVIEW OF LITERATURE
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ABSTRACT Introduction: After trauma malunion-induced tibial fibular abnormalities are a frequent clinical issue,	

and external fixation to treat them can be challenging. Although the Ilizarov technique is a reliable way of external fixation, many patients reject it due to the discomfort of distraction osteogenesis, the length of time the frame must be used, and the necessity of repeated postoperative visits (1,2). **Methodology:** This patient, a 50-year-old man who had previously been in a car accident and fractured his distal tibia and fibula, received 4 months of treatment from a quack in their town. He arrived at our institution after six months with a malunion of the distal tibia and fibula and a 20-degree angulation with a valgus deformity. **Results:** The patients began therapy the day after surgery and were followed for six months. **Discussion:** A distal tibial malunion can be treated using a variety of techniques. External fixators are an option, but they come with a range of problems for both the surgeon and the patient. We think that the distal tibial locking plate will be shown to be safe and effective in the treatment of sterile malunions of the distal tibia and offers tremendous promise in resolution of these challenging situations, despite the fact that this initial communication only reports on one case.

# **KEYWORDS**:

## **INTRODUCTION:**

After trauma malunion-induced tibial fibular abnormalities are a frequent clinical issue, and external fixation to treat them can be challenging. Although the Ilizarov technique is a reliable way of external fixation, many patients reject it due to the discomfort of distraction osteogenesis, the length of time the frame must be used, and the necessity of repeated postoperative visits (1,2). Pin site infections, joint infections, refracture, greater incidence of delayed and non-unions, malunion, pin breakage, tendon transfixion, and vascular and nerve injury are additional issues related to external fixation (3,4,5,6). An infection or significant soft-tissue or osseous abnormalities in a nonunion are the primary indicators for the Ilizarov circular frame. Internal fixators enable flexible fixation, keeping the benefits of the external fixator while enabling long-term therapy, whereas external fixators are typically employed nowadays to provide temporary stabilisation in fractures after severe injury (8).

In orthopaedics, locking plates are used as an alternative to intramedullary nails for stability and as a replacement for blade-plates and dynamic condylar plates to stabilise osteotomy sites following deformity repair (9,10). Even though no treatment option is appropriate for every patient, locking plate osteosynthesis seems to have a number of noteworthy benefits. It can be used to treat non-unions that occur along the entire length of the tibia, it can help with angular deformity correction when applied to the tension side, and it typically offers stable internal fixation without extensive soft-tissue stripping, minimising the need for a postoperative cast or brace and allowing earlier focus on joint motion and soft tissue rehabilitation. he locking plate would be feasible to reduce or eliminate refracture following hardware removal and prevent the potential problems of infection in a sequestrum under the deep surface of the plate, delayed union, and nonunion by maintaining the blood supply to bone (11). It is possible to prevent harm to the blood supply necrosis, and temporary porosity by limiting how much of the periosteum it gets into touch with (8).

fragmentary blood flow and to give fixed angular stability. Because precise plate contouring is not necessary, they also lower the possibility of primary loss of reduction (10).

We think that using a locking plate not only offers a very stable form of fixation but also enables earlier load bearing capability, which speeds up recovery, and then does away with additional hardware that can limit joint motion. We are not aware of any reports of the use of a distal tibial locking plate to stabilise an osteotomy necessitated by fracture malunion.

# METHODOLOGY:

## Case No l

This patient, a 50-year-old man who had previously been in a car accident and fractured his distal tibia and fibula, received 4 months of treatment from a quack in their town. He arrived at our institution after six months with a malunion of the distal tibia and fibula and a 20-degree angulation with a valgus deformity.

After injecting antibiotics and administering spinal anaes thesia, the lower tibia was approached medially while preserving the saphenous vein and taking the anterior tibial tendon laterally. There was a huge volume of callus surrounding the tibia that was removed. A fibular osteotomy was carried out after a lateral incision was done. Tibial reduction was not achieved despite numerous attempts for reduction.

Wedge-closing tibial osteotomy is performed. The distal tibia was secured with locking screws after a distal tibial locking plate was selected. In the frontal plane, these screws were positioned parallel to the ankle joint. To prevent heat necrosis of bone at the osteotomy site continuous irrigation was done. As the distal screws were parallel to the joint, and perpendicular to the plate, the deformity was corrected, and visualized with the C-arm in both planes. The articulated tension device was used to compress the osteotomy, and the proximal screw holes were filled with locked screws. Fibula also fixed with nonlocking reconstruction plate.

Locking plates function as "bridge plates" to maintain

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Exercises for the ankle and foot were started on the first postoperative day.

On the second postoperative day, just before discharge, crutch training was initiated. Up to the end of the sixth week, exercises and restricted weight bearing were continued. At that point, radiographs revealed consolidation of the osteotomy. Crutch support was stopped at that time. He returned to carry out his daily duties at three months.





PRE-OP AP X RAYS

PREOP CLINICAL PIC

PRE-OP LATERAL X RAYS



INTRA OP PHOTO







POST OP LATERAL X RAY

RESULTS

The patients began therapy the day after surgery and were followed for six months. Both osteotomies healed within six weeks without complications. There was no loss of position or fixation. The average time to full weight bearing without crutches was 12 weeks. Full flexion and extension of the knee and ankle occurred by the end of the first week. The patients returned to normal activity within 14 weeks, with full range of motion, no pain, and complete satisfaction.

### DISCUSSION:

A distal tibial malunion can be treated using a variety of techniques. External fixators are an option, but they come with a range of problems for both the surgeon and the patient. Malunions have been treated using internal fixators such as intramedullary nailing and blade plates, but none have the same fixing stability as the locked plate. Due of the locking plate's significant advances, there is little information available regarding its application.

We consider the locking plate to be a superior form of fixation to external fixators and other types of internal fixation for a variety of reasons. Although it is covered under the skin and can remain in place permanently, the locking plate functions as an exterior fixator.

An intramedullary nail may be used for fixation of the tibia, however due to the widening of the intramedullary canal in the distal third of the bone, the intramedullary nail, absent successful placement of blocking screws, is not always a stable construct even with distal locking screws in place. We agree with Strauss et al assessment that, in the distal metaphysis of the tibia, locking plates showed typically enhanced fixation stability compared to intramedullary nails. Comparing the locking plate to older compression plates with non-locking screws reveals extra benefits. Locking screws effectively act together in parallel to prevent any screw track displacement or widening, as opposed to conventional screws that fail by toggling within the bone and acts in series, each screw functioning effectively alone (10).

Because there is no compression between the plate and the bone, periosteal blood supply is restored earlier resulting in prompt healing. The ability of the locking plate to act as a "Bridge plate" and its extreme stability by design contributes to prompt healing. The plate also allows the patient to begin soft tissue rehabilitation, joint motion, and weight bearing earlier than with other devices.

Weight-bearing prevents osteoporosis from inactive lifestyles, hastens fracture healing, and has significant psychological benefits. In the absence of external hardware, early range of motion is possible and fracture disease is avoided. As a result, the amount of time required for rehabilitation increases if the patient is unable to engage in early motion due to pins transfixing the soft tissues or unable to perform appropriate exercises because of weak fixation. A locking screw through the distal fragment of the tibia parallel to the ankle joint, and a locking screw through the proximal fragment of the tibia parallel to the knee joint ensure that the tibia is aligned properly in the frontal plane, and that the frontal plane deformity has been corrected.

We think that the distal tibial locking plate will be shown to be safe and effective in the treatment of sterile malunions of the distal tibia and offers tremendous promise in resolution of these challenging situations, despite the fact that this initial communication only reports on one case.

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