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Case Report

Treatment of Infected Gap Non-Union of Tibia with Ilizarov Technique: A Case Report

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Abstract: Treatment of infected gap non-union of tibia occurring mostly after trauma and often complicated by infection is difficult to treat. Daily clinical practice in fixation, soft tissue management, and antibiotic therapy, treating infected gap nonunion of the tibia remains a problem for Orthopaedic surgeons. Management includes thorough debridement, stabilization of the fracture, and reconstruction of the bone defect. The study's goal was to evaluate the Ilizarov fixator frame's effectiveness in treating tibial gap nonunion.

Keywords: Infected, Non-Union of Tibia, Ilizarov Technique.

INTRODUCTION

The Ilizarov external fixation technique has been used for the last five decades for the management of infected long-bone nonunion. This method uses the percutaneous insertion of fine-tensioned wires to provide a stiff and stable frame construct [1-6]. It permits compression, distraction, bone-lengthening, and deformity correction. Internal fixation can be hampered by infection, bone loss, deformity, or a previous internal fixation failure, making this an excellent alternative option [7]. Methods like soft-tissue rotational flaps, antibiotic cement beading, bone grafting, bone transplants, Chronic diaphyseal infections caused by a lack of union can be treated by Ilizarov [8]. However, the Ilizarov fixator delivers superior results in more than 4cm of nonunion gap defects [9] and infection prevention at the same time. This is a case report of 3.5 cm infected gap nonunion of the tibia using bone transport technique using Ilizarov ring fixator.

CASE PRESENTATION

Mr. Minarul, a 25-years older man with no known medical illness, nonsmoker, alleged motor vehicle accident (motorbike vs. Local vudvuti) on December 2020 and was admitted with an open comminuted fracture distal third right tibia-Gustilo II. Initially, the wound was debrided, and the Ilizarov ring fixator was done on the same day of the accident to manage the wound and soft tissue. After the initial surgery, the wound margin is necrosed after seven days, and the pus is coming out. Bone is exposed, and butterfly fragment is coming out and make a gap at the fracture site. After Regular dressing with parenteral antibiotic therapy, infection is not controlled.

Unfortunately, 1 month later, the seropurulent discharge came out from the fracture site. Blood investigation shows leucocytes at 12,400/L, ESR at 100 mm/hr, and CRP at 24mg/L. The x-ray shows a gap with osteolysis at the fracture end. Diagnosis of osteomyelitis with gap nonunion was established. The patient was operated on again by removing all fixators, wound debridement, and bone resection up to the

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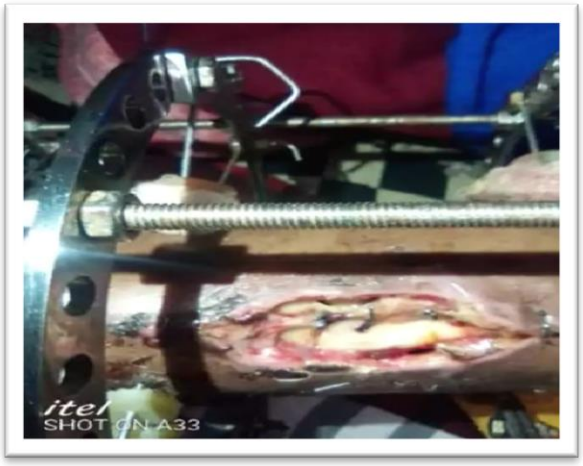
presumed healthy area during the operation and 3.5 cm gap occurred.

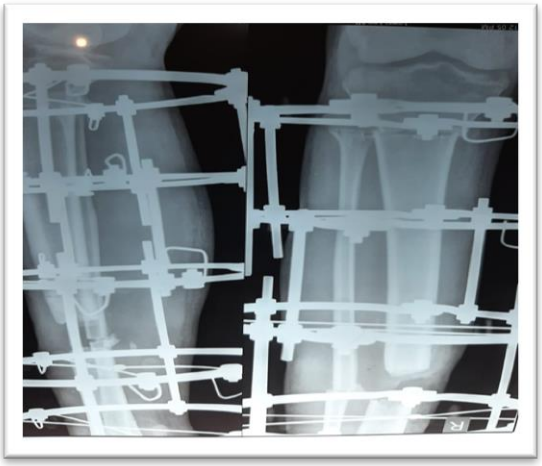
And the Ilizarov external fixation again with proximal cortectomy. After 5 days of distraction, osteosynthesis starts to compress the distal segment.

A) During first surgery

B) Post operative x-ray



C) After 7 days of 1st Surgery



D) Post operative x-ray after 2nd Surgery

E) Fellow-up after 5 months

F) Fellow-up after 5 Month

We proceeded with an elongation of 1 mm per day; after 45 days, 3.5 cm of bone elongation was reached. Four months after the last surgery, there were no radiological or laboratory signs of infection. There is only one or two pin site infection. After 5 months, radiologically healed fracture site, as well as proximal corticotomy site consolidation, occurred. The Ilizarov fixator was removed, and a short leg plaster cast was applied for three weeks. At the last follow-up at six months, the patient walks with a leg brace.

DISCUSSION

Despite the fact still, the management of bony defect nonunion with infection is a challenging problem for many orthopedic surgeons. The Ilizarov technique combined with appropriate antibiotic treatment is a good option for the surgical treatment of bone gap nonunion with infection. The Ilizarov technique has been demonstrated to be comparable or better compared with other surgical techniques reported in the literature [9,10]. The wide debridement of the bone and the soft tissue allows the removal of infection and non-vital tissue [11, 12]. Reducing the risk of recurrent infections and the increases of the post-operative complication such as delayed union, nonunion, and vascular thrombosis [13,14]. The use of an Ilizarov fixator allows the bone-gap recovery after the dead bone resection and the infected tissue debridement.

The Limb lengthening using bone transport technique with Ilizarov has been suggested as the option in filling bone defects. It was chosen for this case after a thorough discussion with the patient as the most appropriate option. The patient was young, cooperative, and has good family support. The patient's age is of an importance in the adjustment of the distraction rate to avoid complications such as premature consolidation or exceeding the capacity of growth of the vascular supply. Moreover, the patient was given comprehensive education, which is essential for prolonged periods of time and the need for regular follow-up and monitoring.

CONCLUSION

This patient's treatment was focused on controlling infection, promoting bone repair, and restoring normal function to both limbs. Even though this instance was extremely difficult, the limbs were effectively lengthened. Using an Ilizarov external fixator improves bone transfer, infection control, and fracture site consolidation. It allows patients to bear weight during therapy. Amputations are avoided because to this technique. However, one disadvantage of this approach is that it causes discomfort to patients. Based on our results, we can successfully treat Infected nonunion tibial fractures with Ilizarov external fixators.

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