

Modified Ilizarov in difficult Fracture of the Patella. A case report

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What to Learn from this Article?

Failed osteosynthesis after fracture patella is a difficult situation. A modified Ilizarov technique is discussed here.

Abstract

Introduction: Ilizarov technique yields satisfactory results in difficult situations. Widely displaced fracture of the patella after failed osteosynthesis is a difficult situation. We are reporting one such case in a 27 years old male treated by modified Ilizarov technique.

Case report: A 27-years old male with transverse fracture of the patella was fixed with tension band wiring. He indulged in heavy manual work including bicycling after 15 days of operation contrary to advice that led to loosening of implants and failure of reduction. He reported after 2 months of failure. A modified Ilizarov technique was contemplated. Implants were removed. After cleaning the margins, opposite olive wires (2 in each fragment) mounted in traction units were attached to two full rings, each fixed to distal femur and tibia. Sub-acute docking was done on the table followed by gradual docking till the fragments came in contact to each other. Compression was applied across the fracture site after confirmation of docking by X-ray at the rate of 0.25 mm every 3rd day till 1.0 mm of compression was achieved. Full weight bearing was possible immediately after surgery. Regular follow up was carried out to look for any pin site problems and loss of compression. Assembly was removed after X-ray confirmed sound healing after 2 months. Initially there was restriction of movements at the knee joint which improved gradually with physiotherapy. At one year follow-up, the patient could squat completely.

Conclusion: Widely displaced fracture of the patella after failed osteosynthesis is a difficult situation Modified Ilizarov technique is beneficial for treating such a situation in terms of

function and restoration of anatomy as it avoids soft tissue scarring which may follow in an attempt to do an open reduction. Gradual stretching of the soft tissue and subsequent controlled compression at the fracture site is the advantage of this technique.

Keywords: Difficult, Fracture, Patella, Modified Ilizarov.

Introduction

The aim of treating fracture of the patella is to restore the intricate extensor mechanism of the knee joint. It becomes increasingly difficult to restore the mechanism after failed osteosynthesis with the fragments widely displaced. Ilizarov has proved to yield satisfactory results in various difficult situations like non-unions, limb length discrepancies, and deformities [1]. We report a case of difficult fracture of the patella in an adult, after failed osteosynthesis with gross displacement being treated by this method with modification of the original technique suggested by Ilizarov [2]. It appears to be the only case report by this technique.

Case report

A 27-years old male sustained transverse fracture of the patella with gross displacement while playing football. The fracture was subsequently stabilized with tension band wiring with two Kirschner wires (K-wire) & figure of eight stainless steel wire. The immediate post operative period was uneventful. He was discharged after stitch removal with knee support and was advised partial weight bearing with knee bending exercises in between. However, he indulged in heavy manual work including bicycling after 15 days of surgery. This led to loosening of implants and failure of reduction. He reported after 2 months of

Author's Photo Gallery



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Figure 1: Failed osteosynthesis at presentation

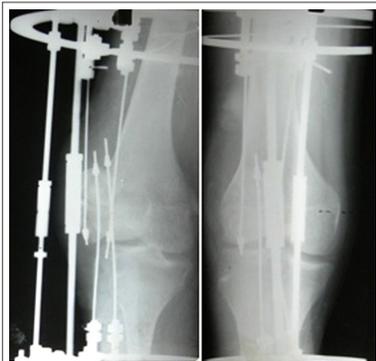


Figure 2: Post Operative X-ray after Ilizarov



Figure 3: Final X-ray with remodeling



Figure 4: Clinical pictures showing excellent functional result

failure with pain, swelling and stiffness of the knee joint. X-rays revealed wide displacement of the fragments with loose implants (Fig. 1).

The options for such a case were either patellectomy or apposing the fragments by some means. Patellectomy would lead to difficulty in apposing the ligaments as there were gross displacements of the fragments leading to contracture of soft tissues on either side of the patella. Apposing the fragments would require extensive soft tissue dissection and lengthening of the quadriceps tendon resulting in extensive scarring and stiffness. As we were accumulating experience by using Ilizarov in various situations, we opted for it to mend the difficult situation in this case. We felt gradual docking with slow stretching of the soft tissue without any dissection would be the perfect choice for the case. After removing the implants, the fracture margins were cleared of fibrous tissue taking care not to remove any bone. As acute docking was not possible, sub-acute docking was contemplated on the table. Opposing olive wires, 2 in number on either fragments (total 4 in number), attached to traction units were passed through the fragments which were mounted on two full rings on either side (joining two half rings). The rings were fixed to distal femur and proximal tibia by wires and interconnected with threaded rods. The fragments were brought together as close as possible on the table by turning the nuts on the traction units (sub-acute docking); subsequently gradual docking was done with the help of traction units till X-ray showed complete contact. The traction unit consisted of slotted threaded rod with mounted K-wire which was held in place by nuts [3]. These units were mounted on the ring by male post. After docking, as confirmed by X-Ray, compression was applied across the fracture site at the rate of 1/4th turn every 3rd day till one millimeter of compression was achieved (Fig. 2). Full weight bearing was allowed as pain permitted. Patient was followed up every 2 weeks looking for pin site infections and loosening of the compression achieved. Assembly was removed when X-ray showed complete healing.

Result

There were no major pin site problems. The patient was comfortable with the system. He was happy that he could take full weight on the injured limb. Only drawback was that knee flexion was not possible till the apparatus was on. Fracture united in 2 months time. Initially after removal of the apparatus, there was restriction of movements at the knee

joint. He was managed with physiotherapy in the post removal period. The range of movement showed improving trend so that at one year follow up, he could squat completely. X-ray at the last follow up (at 4 years) showed remodeling of the articular surfaces (Fig. 3). There was no pain and the patient could perform all manual works as required in his profession including cycling, carrying weights, and running. He indulged in playing football as before without any problem (Fig. 4).

Discussion

The main obstruction encountered while treating long standing widely displaced patellar fracture is the difficulty of bringing the fragments to each other due to contracture of surrounding soft tissues like quadriceps muscle, patellar retinacula and ligaments. Various methods have been described to treat difficult patellar fractures such as (A) Observation and conservative treatment in selected cases [4], (B) Single stage operative procedure to bring the fragments together entailing extensive soft tissue dissection, sometimes requiring V-Y plasty of the quadriceps tendon leading to increased potentiality of infection, scarring and stiffness [5,6]. In other reports, two stage treatment was suggested which consisted of preoperative traction to the proximal fragment by any means like Ilizarov ring fixator to approximate the fragments followed by internal fixation at a later date [7,8]. It looks logical as the soft tissue dissection is kept at the minimum which is essential to regain function of the knee joint. But this procedure has the disadvantage of being staged, thus requiring the patient to undergo more anaesthetic and surgical trauma. Ilizarov himself had suggested treatment of fresh fracture of the patella by two wires and a plastic half ring [2]. ASAMI group suggested treatment of fresh fracture of the patella by two olive wires from opposite directions, each affixed to half-rings which were then interconnected [9]. While searching for similar reports in literature, we could not come across any one similar to our technique. The advantage of a full ring being mounted each on femur & tibia was that it improved the stability of the system. Two olive wires used in each fragment (total 4 in number) helped in directing the compressive forces to be equally distributed between the two fragments.

Conclusion

Our case appears to be the only case report of treating a difficult patella fracture by two ring construct with traction units. The technique with

gradual docking and subsequent compression proved to be beneficial for treating displaced patella fracture after failed internal fixation in terms of anatomical and functional points of view as a single stage procedure.

Clinical Message

Widely displaced fracture of the patella can be successfully treated by modified Ilizarov technique as a single stage procedure. Gradual stretching of the soft tissue without scarring helps in regaining movements in the knee joint. Directed & regulated compression across the fracture ensures healing of the fracture.

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