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Dr. Abhinav Jogani

Assistant Professor,

Department of Orthopaedic,

GMC Nagpur, Maharashtra,

India

Dr. Lomash Bharti

Senior Resident, Department

of Orthopaedic, GMC Nagpur,

Maharashtra, India

Gauri Patki

Senior Resident, Department

of Orthopaedic, Rajawadi

Hospital, Ghatkopar East

Mumbai, Maharashtra, India

Dr. Nilay Hande

MS Ortho, Consultant

Orthopaedic Surgeon VIMS

(Vidarbha Institute of Medical

Sciences), Nagpur,

Maharashtra, India

Proful Borkar

MS Ortho, Consultant

Orthopaedic Surgeon, VIMS

(Vidarbha Institute of Medical

Sciences) Nagpur,

Maharashtra, India

Corresponding Author:

Dr. Lomash Bharti

Senior Resident, Department

of Orthopaedic, GMC Nagpur,

Maharashtra India

A rare managed case of extra articular proximal tibia nonunion with implant failure with severe virus deformity

Dr. Abhinav Jogani, Dr. Lomash Bharti, Gauri Patki, Dr. Nilay Hande and Proful Borkar

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Abstract

Introduction: Nonunion of proximal tibia is an exceedingly rare entity. Management of nonunion of proximal tibia can be particularly difficult and may present unique challenges in management such as malalignment, a short proximal segment and soft tissue compromise.

Case presentation: We here present a unique managed case of 42 years old male Extra-articular proximal tibia nonunion with implant failure with severe virus with shortening which was expertly managed by surgery.

Conclusion: Nonunion of extra-articular proximal tibia treated with fibrous tissue excision, freshening of fracture site, autologous iliac cancellous bone grafting with dual proximal tibia plate with fibulectomy.

Keywords: Compromise, fibrous, grafting, excision

Introduction

The incidence of extra articular proximal tibia nonunion is very low ^[1, 2, 4, 7, 11]. The nonunion rates of proximal tibia fracture are reported to be less than 3% ^[2].

Proximal Tibia is metabolically active area, which comprises of rich vascular supply and large area of trabecular bone that possesses good healing potential ^[1, 2, 5, 8, 10].

Nonunion of proximal tibia is associated with infections, unstable fixation of fracture, poor bone stock and compromised soft tissues condition ^[1, 5].

Operative treatment of extra articular proximal tibia nonunion with implant failure is challenging, as it is associated with pre-existing broken implant, limited bone stock, previous surgical scars and poor soft tissues condition ^[5, 9, 10]. The goal of management consists of complete union of fracture, re-establishment of alignment of lower limb and recovery of function of limb.

There are various methods of treatment of proximal tibia nonunion such as plate fixation, intramedullary nailing and external fixation including Ilizarov technique. Rigid internal fixation is the most acceptable method of treatment of nonunion ^[1, 3, 5, 6, 9]. Post-operative rehabilitation has to be balanced between early or late weight bearing, as early weight bearing may lead to implant failure whereas late weight bearing may lead to disuse osteopenia and refracture.

We here present a unique managed case of Extra-articular proximal tibia nonunion with implant failure with severe virus with shortening which was expertly managed by surgery.

Case report: We present a case of 42-year Male, farmer by occupation, who came to us in OPD with Pain in right lower limb, difficulty in walking and performing ground level activities for 1.5 years. He had history of trauma due to RTA 18 months back and sustained right sided closed extra articular proximal tibia fracture with no neurovascular deficit. For this open reduction & internal fixation with lateral column proximal tibia plating was done elsewhere, of which no previous records were available. Patient was advised nil weight bearing but he was non-compliant and started weight bearing early. 1-year post surgery patient started complaining of pain & deformity over right knee and shortening of the same limb.

Patient presented to us 18 months first after surgery with complain of deformity of right knee and difficulty to bear weight on right lower limb.

Physical examination revealed 20-degree varus deformity of Right knee, Range of movement of knee joint was within normal limits, shortening of 3.5 cm in right lower limb, radiographs revealed Hypertrophic Nonunion of proximal tibia with broken implant (Lateral column proximal tibia plate).

Plans

Our planning for this case was

- Extended lateral Approach
- Implant removal
- Medial open wedge osteotomy of proximal tibia
- Fibulectomy
- Iliac crest bone graft
- Dual plating

After taking consent, under spinal anaesthesia, in supine position using extended lateral approach. Exposure of entire broken implant was done and diligently implant was removed without any complications. All fibrous tissue was removed and fracture site was freshened. CORA (Center of rotation of angulation) of genu varum deformity was identified, medial open wedge osteotomy on tibia and partial fibulectomy was performed. After appropriate alignment and reduction, autologous iliac cancellous bone grafting done. Fixation of the proximal tibial fracture was done by using dual plate, laterally long anatomical proximal tibia locking plate and anteromedially L shaped proximal plate. Intraoperative alignment of lower limb and implant position checked under fluoroscopy.

Post-operative: Immediate post-operative x-ray was suggestive of normal alignment of lower limb, dual proximal plate with fracture gap filled with autologous bone graft and shortening was 1.5 cm.

2 weeks Post operatively, suture was removed and patient was advised strict nil weight bearing and knee ROM was started.

After 6 weeks follow up radiograph was suggestive of Callus formation and partial weight bearing was started and full weight bearing was allowed after 3 months.

After 18 months of follow up x-ray shows complete union of fracture site and implant in situ. There is 1.5 cm shorting of limb which was managed by shoe raising foot wear.

Patient is now able to walk properly with full weight and able to perform all activities of daily routine activity without any difficulty. Patient is back to work in the fields.

Discussions

Extra articular proximal tibia nonunion is a very rare entity [1, 2, 4, 8, 9]. When nonunion develop in proximal tibia, their management can be extremely challenging because of tenuous soft tissue and small periarticular segment of proximal tibia.

Retrospective inspecting of this case, we hypothesised that proximal tibia is high weight bearing area, in extra articular proximal tibia fracture isolated lateral proximal plate is incapable to control medial collapse, especially when medial comminuted fracture leading to progressive varus deformity. Routine implants which have been traditionally used to treat proximal tibia fracture, need to be supplemented with supplementary medial plate in order to share to weight bear in medial comminuted zone [1, 2, 3].

Management of proximal tibia nonunion consists of proper clinical and radiological evaluation, restoration of mechanical axis of lower limb and deformity correction. Fibulectomy was a well-established procedure in the treatment of proximal tibia nonunion since decades [4, 9, 11]. Meticulous pre-operative planning and diligent post-operative rehabilitation protocol with frequent follow-up is very essential part of management of proximal tibia nonunion [5, 7, 8].



Fig 1: Pre-op clinical picture



Fig 2: Pre-op X-ray



Fig 3: Immediate post op clinical picture



Fig 5: 6-week post op X-ray



Fig 4: Immediate post op X-ray



Fig 6: 18 months follow up clinical picture

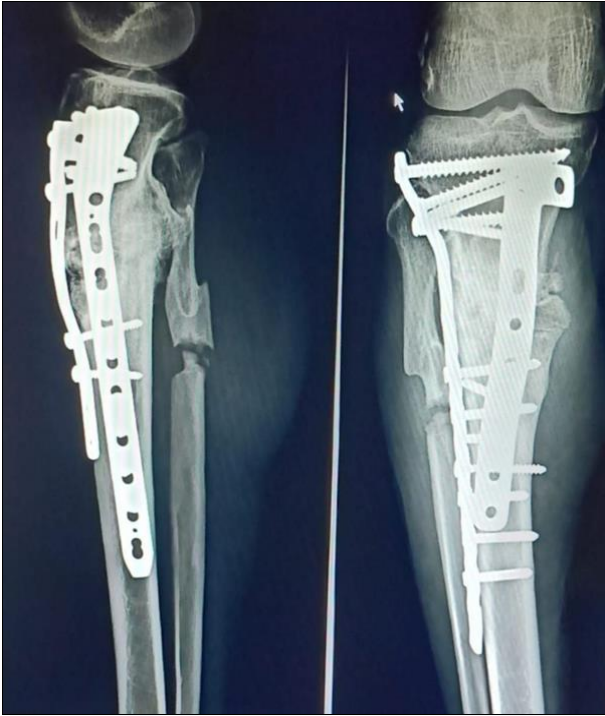


Fig 7: 18 months follow X-ray picture

Conclusion

Proximal tibia nonunion with broken implant management is quiet challenging. Pre-operative planning and identification of cause of implant failure is important. Dual plating with fibulectomy is good method for management of extra articular proximal tibia nonunion with implant failure.

Clinical message

Proximal tibia is high stress zone and very prone to implant failure. Meticulous pre-op planning is important, it is better to fix with dual plating.

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