

Management of Distal Femur Periprosthetic Fracture in an Elderly Patient by Open Reduction and Internal Fixation With Locking Plate Osteosynthesis –: A Case Report

Neetin P. Mahajan¹, Amey S Sadar¹, Umesh Jadhav¹, Pranay Kondewar¹, Shubham Atal¹, Kartik Pande¹

Learning Point of the Article:

Periprosthetic distal femur fracture is a rare entity. It is very difficult to manage. Open reduction and internal fixation with locking plate provides anatomical reduction of the fracture side and we can assess the position of the implant in the same incision. It provides excellent clinical and radiological outcome.

Abstract

Introduction: Distal femur periprosthetic fractures are rare entities and difficult to manage. Supracondylar femur fractures are most common amongst periprosthetic fractures. They can be managed by various modalities. These fractures are often difficult to treat because of various factors like such as osteoporosis, communication, female gender, and poor bone stock. Fixation of supracondylar femur fracture by locking plate provides excellent results in terms of radiological and clinical outcomes.

Case Report: We report a case of a 70-year-old female with pain and swelling in the right knee since for 1 day. She had a history of fall in bathroom 1 day back. The patient was operated with total knee replacement 6 years back for grade Grade 3 osteoarthritis of the knee. The patient was known case of hypertension and was on medication for the same. We operated the patient by open reduction and internal fixation with distal femur locking plate and it provided excellent clinical outcome.

Conclusion: Periprosthetic supracondylar femur fractures are rare entity entities and generally difficult to manage, especially in elderly patient, due to poor bone quality. The choice of implant used to treat such fractures depends on the surgeon's choice and patient's compliance. Open reduction and internal fixation with a locking plate is a good entity as it provides excellent clinical and radiological outcome.

Keywords: Distal femur, supracondylar, periprosthetic fracture, total knee replacement, open reduction and internal fixation

Introduction

Periprosthetic fractures are rare entities [1, 2] most common type of periprosthetic fracture in the distal femur are supracondylar femur fractures [1, 2, 3]. Factors responsible for the development of these fractures are many [3, 4, 5, 6]. These include osteoporosis, female gender, poor patient compliance, inflammatory conditions such as rheumatoid arthritis (RA), intraoperative cortical perforation, preoperative femoral deformities, altered biomechanics of the limb after joint arthroplasty, especially after revision surgery [3, 4, 5, 6]. This

fractures provides many challenges due to its anatomical location and limited bone stock available for implant fixation. Various modalities are available for fixation. They can be divided into conservative and operative modality. Conservative modalities are obsolete [7, 8, 9] these days because of longer duration of immobilization, failure of union of fracture, and poor patient compliance. Operative management provides early range of motion, lesser duration of immobilization, and early weight-bearing. Various methods are employed for fixation. Distal femur nail, anatomical locking plate, less (less invasive stabilization

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Author's Photo Gallery



Dr. Neetin P. Mahajan



Dr. Amey S Sadar



Dr. Umesh Jadhav



Dr. Pranay Kondewar



Dr. Shubham Atal



Dr. Kartik Pande

¹Department of Orthopaedics, Grant Government Medical College and J.J. Group of Hospitals, Mumbai, Maharashtra, India.

Address of Correspondence:

Dr. Amey Sadar,
Resident doctor, Department of Orthopaedics, Grant Government Medical College and J.J. Group of Hospitals, Room Number 727, 300 Resident Hostel, Hospital,
Mumbai - 400 008, Maharashtra, India.
E-mail: ameyysadarr@gmail.com

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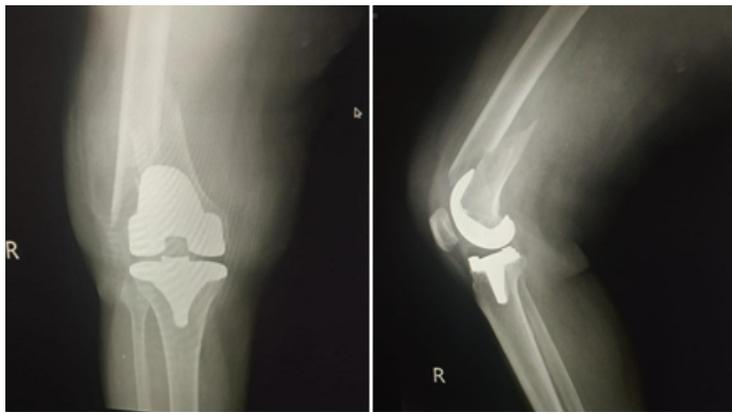


Figure 1 a and b: Preoperative distal femur supracondylar long oblique periprosthetic fracture.

system) are generally used. Distal femur nail provides good stability with minimal damage to soft tissue but all total knee replacement prostheses are not compatible with distal femur nail design. In such cases, fixation of the fracture with locking plate is preferred. Open reduction and internal fixation (ORIF) with locking plate provide anatomical reduction under vision and early mobilization of the patient. Although it is not devoid of complications as it usually involves soft tissue stripping near the prosthesis, causing devascularization of the already weakened supracondylar femoral region [3, 6]. Extensive stripping sometimes is needed to attain good anatomic reduction and due to the associated severe comminution, there is a high risk of delayed union and nonunion [8, 10, 11].

Case Report

A 60-year-old female presented with complaints of pain and swelling in the right knee for 1 day. The patient was operated with total knee replacement 6 years back for Grade 3 osteoarthritis of the knee. The patient was known case of hypertension and was on medication for the same. On clinical examination, the patient presented with localized tenderness and painful restriction of movement around the knee joint. An old scar mark of total knee replacement was present. The scar



Figure 1 c and d: Immediate post-operative X-rays showing locking plate with tkr implant.

mark was clean and healthy. Plain radiographs of the right knee with a total length of the femur was taken in AP and lateral view. The radiographs showed extraarticular long oblique distal femur fracture with the prosthesis in situ. On radiographs, TKR implant was stable and no loosening was observed. CT scan was done to know the extent of the fracture and congruity of the condyles. Blood investigations were done to rule out the infections and they were observed normal. Hypertension was controlled before the planned surgery. Swabs were sent from the axilla, groin, nasal cavity, and ear to rule out any superficial skin infection with due consent. Patient was planned for open reduction and internal fixation with a locking plate. Under all aseptic precautions, the patient was kept in the supine position. The knee was placed in 30 degree flexion. Incision was taken on the lateral aspect of the thigh with schwab-buckler approach. Soft tissue was dissected in layers and fracture site was identified. Hematoma was removed and edges were freshened. The reduction was obtained with bone holding clamps, confirmed under C-arm guidance. Temporary thick K wires were placed for holding the reduction. Distal femur locking plate of 11 holes with locking screw was used for fixation. Formal inspection of the TKR implant was done to know the position and any signs of loosening. Procedure was uneventful and wound

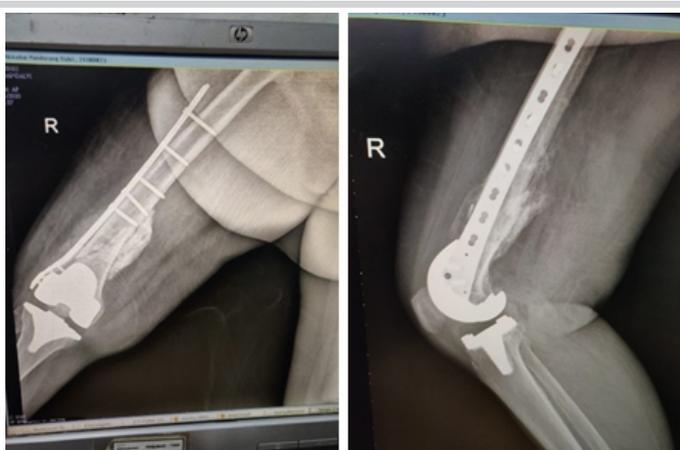


Figure 1 e and f: Follow-up after 1 month showing progressive callus formation at fracture site.

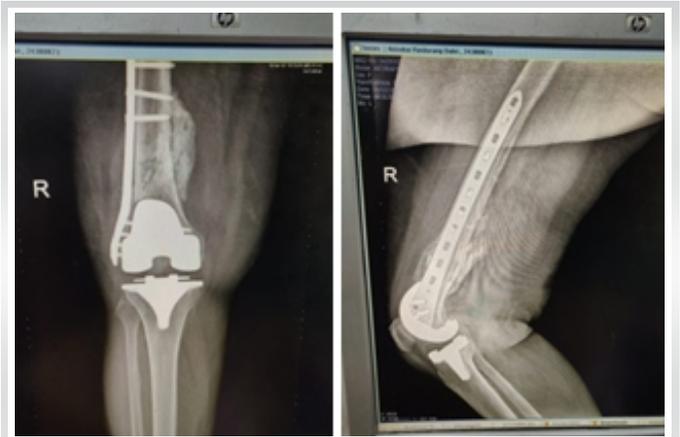


Figure 1 g and h: Follow-up after 3 months showing adequate callus formation and obliteration of fracture site.

was closed in layers. The limb was protected with a rigid long knee brace. Check dress was done on day 5 and it was healthy. Patient was discharged on day 12 with all sutures removed. Patient was kept on nil weight bearing on the affected limb with the help of walker for 1 month. Physiotherapy for operated limbs was advised. Follow-up was taken on day 21, 1 month, and 3 months, respectively. Follow-up X-rays were taken with respective visits. Patient being housewife by profession went back to her routine life.

Discussion

Periprosthetic fractures are rare entities in total knee replacement. The incidence of periprosthetic fractures in TKA is increasing. These fractures are classified according to their location and prosthesis integrity. In the setting of a supracondylar fracture about a well-fixed prosthesis, plate and nail fixation of the fracture present themselves as good options, each having its own unique benefits and pitfalls. Various factors are responsible for causing periprosthetic fracture such as female gender, osteoporosis, limited bone stock, and recent corticosteroid treatment [1, 12]. Advanced age is a major risk factor regarded as an individual risk factor itself, as well as a risk factor for osteoporosis and recurrent falls, each of which on their own are qualified as risk factors for periprosthetic fractures. Challenges in the surgical management of fractures by ORIF are associated comminution at the fracture with bone impaction and bone loss, at times [5]. Consequently, this fixation may need to be protected in a brace till radiological evidence of bone healing. Plate fixation is regarded as an

acceptable operative procedure in an elderly patient with periprosthetic femoral fractures, even with slightly loosened prostheses [13, 14, 15]. The aim of treatment in fractures of the distal femur proximal to the TKA prosthesis is to achieve a painless stable knee without any residual malalignment and malfunction [3, 8, 12]. Early mobilization is essential in obtaining a good result.

Conclusion

Distal femur periprosthetic fractures are rare. In an elderly patient with TKR prosthesis, it is difficult to manage. The choice of implant used for managing such fractures depends on the surgeon's choice and patient's compliance. Locking plate osteosynthesis in periprosthetic fracture provides excellent anatomical reduction with good clinical and radiological outcome, especially in osteoporotic bone. Other operative methods can be employed according to the requirement of the patient each having its own advantages and pitfalls.

Clinical Message

Periprosthetic fracture is a difficult entity to manage. Careful preoperative evaluation and planning are essential to get the best outcomes. The operating surgeon may choose between closed and open reduction techniques both having its own advantages and disadvantages.

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