

Complex Proximal Malunited Tibial Plateau Fracture Treated Primarily by Total Knee Arthroplasty-A Case Report

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Learning Point of the Article:

Primary TKA for proximal tibia fracture is an option for elderly patients based on a clinical and radiological presentation the surgeon can opt for total knee arthroplasty even in younger individuals.

Abstract

Introduction: Post-traumatic Osteoarthritis osteoarthritis of the knee is a common complication following malunited proximal tibia fractures treated by internal fixation. Delayed treatment failed internal fixation native splinting can lead to malunited tibia plateau fractures.

Case Report: We report a 10-month-old malunited proximal tibia fracture with osteoarthritis of the knee joint who had underwent native splinting. The patient presented with complaints of pain over the left knee joint and inability to weight bear over his left leg for the past ten 10 months. Radiographs showed malunited proximal tibia fracture. Since there were signs of osteoarthritis of the affected knee joint, it was decided to treat primarily by total knee arthroplasty. Postoperatively, the patient could walk freely without a stick and had no pain. The knee was stable and had a full range of movement.

Conclusion: Post-traumatic knee arthritis is a dreaded complication following both conservative and surgical management of proximal tibia fracture due to immobilization and knee stiffness. The primary use of total knee replacement TKR can be considered an alternative treatment for patients with intra-articular fractures of the tibia not extending past the metaphysical area to provide the patient with a stable and pain-free joint.

Keywords: Proximal tibial plateau fracture, total knee replacement, osteoarthritis knee.

Introduction

Proximal Tibial plateau fractures follows Bimodal age distribution. There are various treatment options available for displaced tibial plateau fractures, the standard of care is open reduction and internal fixation (ORIF). Post-traumatic osteoarthritis is a long-term complication of tibial plateau fractures. It has a prevalence of 21%--44% following fractures of the proximal tibia, patella, and distal femur [1-3]. Various etiologies have been associated with this namely mechanical imbalance due to ligamentous laxity, meniscal tears [4], and non-unions and malunions of fractures [2]. The management management of post-traumatic osteoarthritis can be divided into conservative conservative and surgical. Activity modification, anti-inflammatory medications, ambulatory

assist devices, and physical therapy are the conservative management [4]. Surgical options available include arthroscopic debridement to arthrodesis [5]. In older, lower demand patients, ORIF is potentially less favorable, delayed mobilization, and knee stiffness. Total knee arthroplasty (TKA) is an option for the treatment of end-stage PTA [6].

Case Report

A 55-year-old gentleman, presented with complaints of pain over the left knee joint and inability to weight bear over his left leg for the past ten 10 months. The patient was apparently normal ten 10 months ago, when he had a history of slip and fall from 10 feet height at his workplace in the month of January 2017 and sustained close injury to his left knee. The patient

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Figure 1: Clinical picture at the time of presentation to the outpatient department.



Figure 2: Radiographs at presentation.

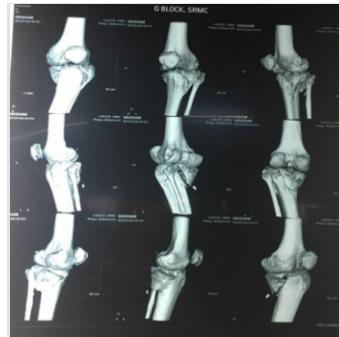


Figure 3: CT Scan with three-dimensional reconstruction.



Figure 4: Computed tomography Scanogram.



Figure 5: Intraoperative picture showing depressed medial plateau.

developed pain and inability to weight bear over his left leg. The patient initially underwent native splinting for 6 months following the injury. As patient was not relieved of his symptoms following native splinting, patient came to Sri Ramachandra Medical College Porur for further management With complaints of pain, deformity, and unable to bear weight on left leg (Fig.1). There is no history of fever, loss of appetite or any other bone injury. The patient is not a known case of diabetic mellitus, Hypertension hypertension cardiac disease tuberculosis asthma epilepsy. The patient is not a smoker or an alcoholic. Examination revealed left lower limb appears to be shorter than the right lower limb. Muscle wasting was noted over the thigh and calf region. Healed abrasion scar present over the anterior aspect of the knee joint and the distal aspect of the leg. Dilated veins present over the posterolateral and the medial aspect of the knee joint. No popliteal fossa fullness was noted. Tenderness present over medial and lateral jointline Swelling present over the anterior aspect of knee joint. Bony mass is palpable over the anteromedial and lateral aspect of the knee.

Broadening and thickening present over the anterior, medial, and lateral aspect of the knee joint. Abnormal mobility was noted.

Measurement	Right	Left
Apparent length	118	116
True length	102	101
Tibial length	40	39
Mid-calf	32	35
Mid-thigh	41.5	40



Figure 6: Intraoperative picture showing depressed medial plateau fixed with a cannulated cancellous screw.



Figure 7: Post-operative radiographs.

The Range range of Movement movement of the knee was 20 to –70° with fixed flexion deformity of 20°.Further movements were painful. There was no neurovascular deficit noted. Radiographs showed comminuted malunited proximal tibia with depression over the medial condyle 1-2 cm and fracture line extending to the lateral and posterior condyle of tibia (Fig.2). Computed tomography CT of the knee revealed that the whole of the medial condyle was depressed by more than >2 cm and the fracture line was extended into the medial and posterior condyle. (Figs.3and ,4).There was no fracture line noted over the metaphyseal region of the shaft of the tibia. Knee joint showed significant osteoarthritis changes. Intraoperatively, we found that the articular cartilage was found to be completely damaged and there was a coronal split of the tibial plateau. The depressed medial condyle was raised and fixed with the help of of cannulated cancellous screw from the medial aspect of the tibia. (Figs. 5, and 6,). He was operated upon using a total knee prosthesis – Smith and Nephew Genesis II system with long stem tibial component and cruciate retaining femoral component. Then, appropriate femoral femoral cuts were made and and size 6 left cemented, nonmodular Genesis II cruciate retaining femoral component with Genesis II long slotted stem placed. An appropriate tibial cut made and Genesis II left nonporous tibial base plate placed. Size 5-613mm Genesis II dished articular insert was placed. Movements of the knee joint were checked intraoperatively and were as found found to be satisfactory. Six 6 weeks postoperatively (Fig. 7), the patient could walk freely without a stick and had no pain. The knee was stable and had a full range of movement.

Discussion

The commonly followed method of the treatment for patients with the above history history would have been to treat with ORIF open reduction and internal fixation and autologous bone grafting. The knee would have been immobilized for four 4weeks,and no weight bearing bearing would have been possible possible for 3-4 months. The patient was initially

treated with native splinting, and there were as significant muscle wasting and fixed flexion deformity of 20° degrees of the knee joint. Further management with the usual treatment protocol will have an increased risk of developing gonarthrosis, deep vein thrombosis DVT, and significant muscle wasting necessitating total knee prosthesis [5, 6]. Hence, we planned for single stage procedure TKA Total Knee Arthroplasty, hence allowing the patient immediate mobilization and weight bearing. Knee arthroplasty has been used after failure of internal fixation of the tibial plateau [5, 7] and in patients with post-traumatic arthritis and have has given excellent results in elderly at midterm follow-up [8, 9]. Treatment with long-stemmed total knee replacement (TKR) has been suggested for fractures of the proximal tibia below an osteoarthritic knee in elderly patients [10]. The primary use of prosthesis has been recommended for the dislocated neck of femur fractures of the hip [11, 12] as well as for comminuted fractures of the proximal humerus [13] and of the distal humerus [14]. Cemented TKA total knee arthroplasty may produce excellent mid- and long-term results in patients younger than 40 years of age with end-stage arthrosis, if they are willing to modify their day to day activities [15, 16]. In a series of 74 cases as reported by Duffy et al. [17] which had 54 patients under 55 years of age a final Knee Society knee score of 84 points, and functional score of 60 points at 10-year follow-up was noted. The study had 18 patients only with with diagnosis of osteoarthrosis or post-traumatic arthrosis. Implant survivorship at 10 years was 99% and at 15 years was 95%. It was only after discussion and consent of the patient that TKA total knee arthroplasty was planned. The good early result was surprising. It might be that the patient

before the accident was fit and had no knee arthritis, but he showed signs of gonoarthrosis from native splinting which was treated with TKR. When using this method, it is important to have at hand tibial prostheses with long shafts allowing for better fixation and cannulated cancellous screw for depressed fractures of the tibial plateau. The primary use of TKR might be considered an alternative treatment for patients with intra-articular fractures of the tibia not extending past the metaphysical area.

Conclusion

Post-traumatic osteoarthritis of the knee is common complication following proximal tibial plateau fracture. Early internal fixation and mobilization in the younger age group are advised. Primary TKA total knee arthroplasty for proximal tibia fracture has been accepted mode of treatment in the elderly age group. In malunion with early osteoarthritis, TKA Total knee arthroplasty can be considered as an option to provide the patient with pain-free and stable mobile joint.

Clinical Message

Primary TKA total knee arthroplasty for proximal tibia fracture is an option for elderly patients Based on a clinical and radiological presentation the surgeon can opt for total knee arththroplasty even in younger individuals.

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