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Case Report

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Capsular avulsion of the lateral tibial plateau with 180-degree rotation: a rare case report

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ABSTRACT

A 40-year-old man sustained a unique lateral tibia plateau fracture pattern with a 180-degree rotated fragment composed of an intra-articular surface and subchondral bone. At final follow-up, the patient regained pain-free activity. This case represents an undescribed fracture pattern that indicates an associated cruciate injury. A thorough evaluation, including Magnetic Resonance Imaging should be considered. One-stage ORIF with Herbert screw and partially threaded cancellous cannulated screw was done which represents a good treatment option.

Keywords: Proximal tibia fracture, Tibia plateau fracture, ORIF, Herbert screw

INTRODUCTION

Fractures of Tibia plateau are due to high energy traumas with an incidence of 10.3 per 100,000 annually.[1] Fracture of tibia plateau involve the articular surface and these fractures are commonly associated with injury of soft tissue.[2] The treatment goal of these fractures were to restore the articular surface, alignment of limb and to provide stable fixation with repair of ligamentous or meniscus injuries.[3]

The Pattern of fracture influences the treatment.[4,5] We report a case of lateral tibia plateau fracture with 180-degree rotation and accompanied by a partial thickness tear of the anterior cruciate ligament. To the best of our knowledge, such type of case is rare and had not been discussed in prior studies. ORIF with Herbert screw and partially threaded cc screw was successful in treating the patient.

This unique type of fracture pattern required a preoperative MRI and CT evaluation to avoid surgical challenges. Informed consent was taken from the patients for the publication of data related to the case.

CASE REPORT

A 40 -year-old male patient came to Rama Medical College Hospital and Research Centre OPD room with the alleged history of road traffic accident. Patient complaint of pain in right knee. On the right knee examination, the knee was swollen with ecchymosis around the knee joint, restricted range of motion (ROM), tenderness present at the lateral aspect of the knee joint. The distal neurovascular examination was intact. Radiographs of knee joint (AP and lateral view) demonstrated a lateral tibia plateau fracture and the fragment was 180 degrees rotated (Figure 1). Computed tomography (CT) identified an avulsion fracture of lateral tibia plateau with laterally displaced and flipped fracture fragment (Antero-lateral flip type) (Figure 2). MRI finding was suggestive of displaced fracture of lateral tibial condyle and partial thickness tear of anterior cruciate ligament (Figure 3). The patient was counsel for surgery and consent was taken. Patient brought to the operating room for ORIF of the lateral tibia plateau fragment. Above knee tourniquet was applied. After painting and draping the antero-lateral approach was made to access fracture fragments.

Figure 1: Pre-operative radiograph of the right knee with AP and lateral view showing fracture proximal tibia fracture with fragment flip over 180 degrees.

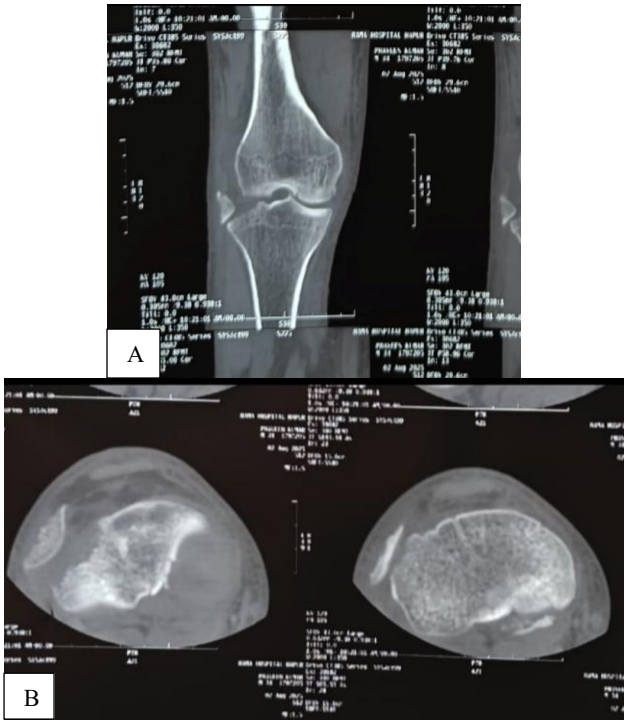

Figure 2 (A and B): Pre-operative computed tomography image showing lateral condyle fragment of proximal tibia plateau turned over 180 degrees with articulation surface downward.

The main fragment was composed of a relatively intact articular surface and subchondral lateral plateau bone. It had outwardly rotated 180 degrees just medial to the iliotibial band. The larger fragment was turned 180 degrees under the C-arm guidance, once the satisfactory reduction of the lateral tibia articular surface was achieved, reduction hold was done with K-wire (3.2 mm) under the C-arm guidance. The fragment was fixed by one Herbert screw of 3.5 mm and one partially threaded CC screw (4.2 mm) under C-arm guidance. The smaller fragment with capsule was tied with ethibond suture (Figure 4 & 5).

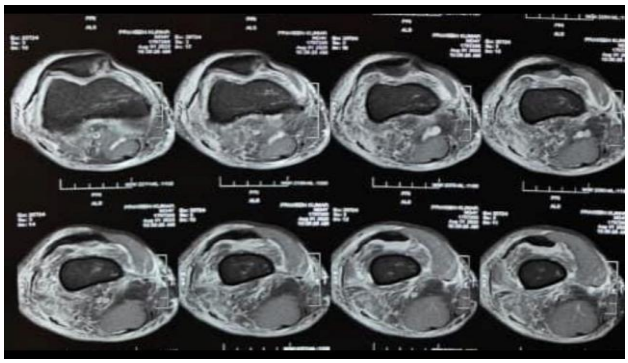

Figure 3: Preoperative MRI of right knee showing displaced fracture of lateral tibia condyle with partial thickness tear of ACL.

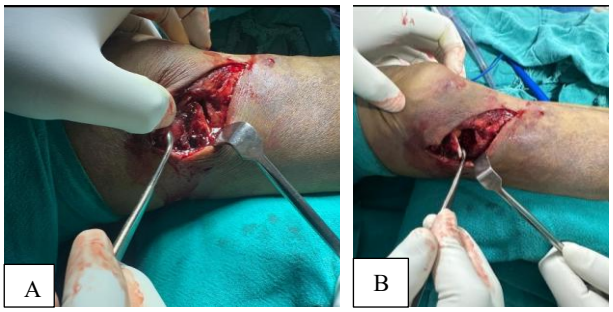

Figure 4 (A and B): Intraoperative image shows fracture fragments of lateral tibia plateau.

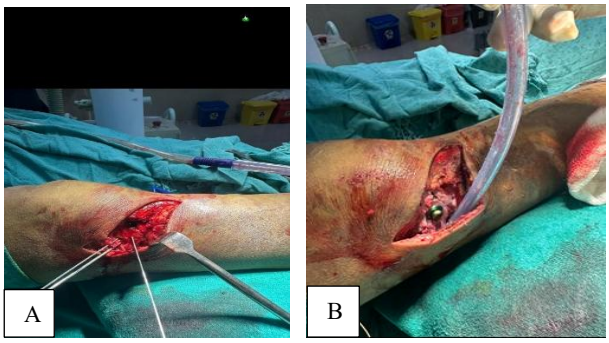

Figure 5 (A and B): Intraoperative image showing provisional reduction of fracture fragment with K wire and fixed with Herbert screw and CCS.

Postoperatively, the knee was protected in full extension with above knee slab for 4 weeks and Rom was started 4 weeks after surgery. Partial weight bearing was allowed after 6 weeks postoperatively, after a period of rehabilitation, full weight bearing was allowed after three months with satisfactory union achieved on radiograph (Figure 6 & 7).

Figure 6: Postoperative radiographs of right knee in AP and lateral view shown acceptable intraarticular reduction.

Figure 7 (A and B): Clinical picture of complete range of motion of right knee after 2 months of surgery.

DISCUSSION

AO/OTA and Schatzker classifications are mainly used to classify the fracture of tibia plateau. The Schatzker classification describes lateral and medial column fractures or fracture dislocations, whay the AO/OTA classify intra and extra articular fracture of the tibia plateau. Three-dimensional (3-D) CT helps to recognize fracture morphology.[6] Now a days various surgical approaches have been used for optimal reduction of fracture fragment and buttress plating.[7]

The maintenance of the anatomic joint line is important when surgically treating fracture of tibia plateau.[3] An antero lateral approach with arthrotomy was developed to access the fracture fragment around the iliotibial band. It was mentioned earlier that fracture of tibia plateau is commonly associated with injury of soft tissue. Daniel et al describe the pattern of meniscus tear among patients of fracture of tibia plateau in 661 patients. Lateral meniscus tear were required repair in 30%. Lateral meniscus tear (peripheral rim) commonly associated with split depression type fracture pattern. Meniscus tears are more common in young males.[8] Jordanna et al compared the functional outcomes. range of motion and pain scores in patients of tibia plateau fractures with and without tear of meniscus. They found no significant difference between two (pain score, functional outcome ROM) after the repair of meniscus.[9] Miguel et al reported the result of meniscus repair associated with fracture of tibia plateau, they found excellent-good results after repair of meniscus in tibia plateau fractures.[10]

CONCLUSION

Finally, to best of knowledge, this was a rare fracture pattern, when encountered such type of fracture a preoperative MRI and CT evaluation helps to determine the most appropriate surgical approach/strategy. We recommend a one stage ORIF with Herbert screw and CC screw fixation via antero-lateral approach followed by a period of non-weight bearing with ROM knee brace protection. Overall, the patient regained pain-free activity after the treatment.

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