International Journal of Research and Review
[Indexed, Peer-Reviewed Journal]
Volume 12; Issue: 6; June 2025
Website: www.ijrrjournal.com
Case Report *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

Management of Complex Schatzker Type VI Tibial Plateau Fracture with Concurrent ACL Injury in a Patient with Prior ACL Reconstruction: A Case Report

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DOI: https://doi.org/10.52403/ijrr.20250638

ABSTRACT

Introduction: Schatzker type VI tibial plateau fractures are high-energy injuries often associated with significant soft tissue damage, including the Anterior Cruciate Ligament (ACL). These complex injuries require careful management due to their potential for long-term complications. This case report presents a 47-year-old male with a Schatzker type VI tibial plateau fracture and an ACL injury, with a prior history of ACL reconstruction.

Case Presentation: The patient presented to the emergency department following a motorcycle accident. Physical examination revealed a swollen and bruised right knee, with considerable pain upon movement. Imaging confirmed a Schatzker type VI tibial plateau fracture, and given the patient's history of ACL reconstruction, a concurrent ACL injury was suspected. Surgical management included Open Reduction and Internal Fixation (ORIF) of the tibial plateau fracture and treatment of the ACL injury. Postoperatively, the patient's condition was stable with controlled pain and good distal joint mobility.

Discussion: The management of Schatzker type VI tibial plateau fractures, especially in conjunction with ACL injuries, requires a meticulous and multi-faceted approach. This case emphasizes the need for an individualized treatment plan considering the patient's prior surgical history. Further research is needed to optimize treatment strategies for these complex injuries.

Conclusions: ORIF plates and screws gave a good result in managing complex Schatzker type VI tibial plateau fractures associated with ACL injuries.

Keywords: Schatzker type VI, Tibial Plateau Fracture, Anterior Cruciate Ligament, ORIF

INTRODUCTION

Tibial plateau fractures are a complex subset of musculoskeletal injuries that often present unique challenges to orthopedic surgeons due to their association with soft tissue damage and potential for long-term complications.[1] Of particular note is the Schatzker type VI tibial plateau fracture, which is characterized by its complexity and high energy, often accompanied by injuries to other structures such as the Anterior Cruciate Ligament (ACL).[2]

A significant percentage of patients with tibial plateau fractures present with concomitant ACL injuries, and it has been noted that the incidence of ligamentous injury increases as the Schatzker classification advances. This association between tibial plateau fractures and ACL injuries necessitates a multifaceted approach to management, often involving both surgical fixation of the fracture and ACL reconstruction.[3] The prevalence data of tibial fracture with history of ACL injury was limited. Only a study showed that around 20% of the tibial fracture had a history of ACL.[4] Mostly, the study only showed tibial fracture concomitant with ACL injury or other fracture.

Treatment options for Schatzker type VI fractures vary, ranging from internal fixation with plates and screws to definitive fixation with circular external fixators.[5] The choice of treatment depends on several factors, including the patient's overall health status, the complexity of the fracture, the extent of soft tissue injury, and the presence of any associated injuries. The management goal is to restore normal lower extremity alignment, allow for early mobilization, and prevent complications such as infection and non-union.[5]

Despite the wealth of literature on tibial plateau fractures and ACL injuries, there remains a gap in the understanding of the best management strategies for patients presenting with both conditions. Furthermore, the long-term prognosis and functional outcomes in this patient population are not well documented. This case report aims to contribute to the body of knowledge in this area by presenting the case of a 66-year-old male with a history of ACL reconstruction who suffered a Schatzker type VI tibial plateau fracture. It is hoped that this report will provide valuable insights into the challenges and complexities of managing such cases.

CASE PRESENTATION

A 47-year-old male patient presented to the emergency department following a motorcycle accident. The patient reported stepping into a hole and falling directly onto his right knee. His medical history was significant for a right ACL reconstruction performed approximately one year prior due to an injury incurred during a sporting event. Patient used to have mild restriction in walking. The patient had no known history of metabolic, rheumatic, or other chronic diseases.

On physical examination, his right knee was noticeably swollen, with varus alignment and significant bruising. There was considerable tenderness on palpation and pain exacerbated by movement of the knee joint. International Knee Documentation Committee (IKDC) knee score was 60,34%. Lachman test and anterior drawer test showed positive result. Neurovascular examination of the right lower limb was unremarkable. Radiological investigations, including X-rays and a CT scan [Figure 1], confirmed a Schatzker type VI tibial plateau fracture of the right knee. Given the patient's history of previous ACL reconstruction and the nature of his current injury, a concurrent ACL injury was suspected.

a. 

b.

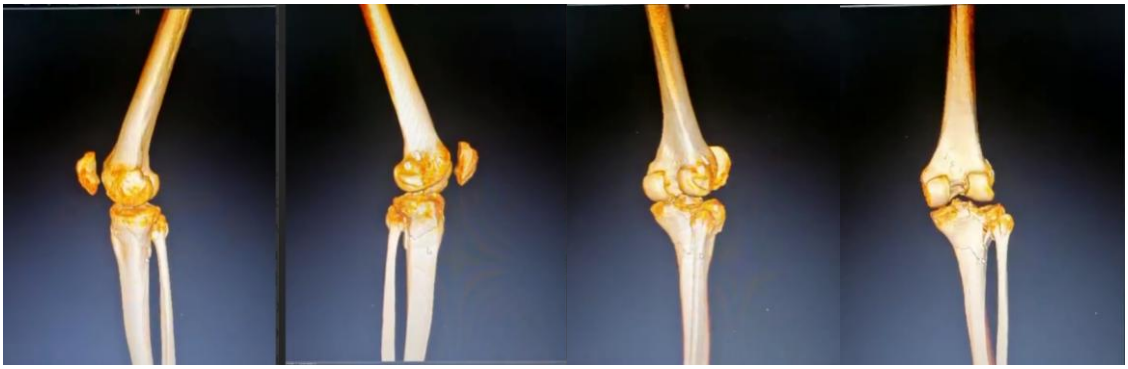

Figure 1. a. X-ray b. CT-Scan of the knee that shows tibial plateau fracture with the grading of Schatzker type VI

The patient was taken to the operating room for definitive surgical management of his tibial plateau fracture. During the operation, the patient lost approximately 400 cc of blood. The fracture was stabilized using an Open Reduction and Internal Fixation (ORIF) technique with plate and screws [Figure 2]. The suspected ACL injury was confirmed intraoperatively. A reconstructive ACL surgery with classic semitendinosus graft was done. Patient underwent for rehabilitation afterwards.

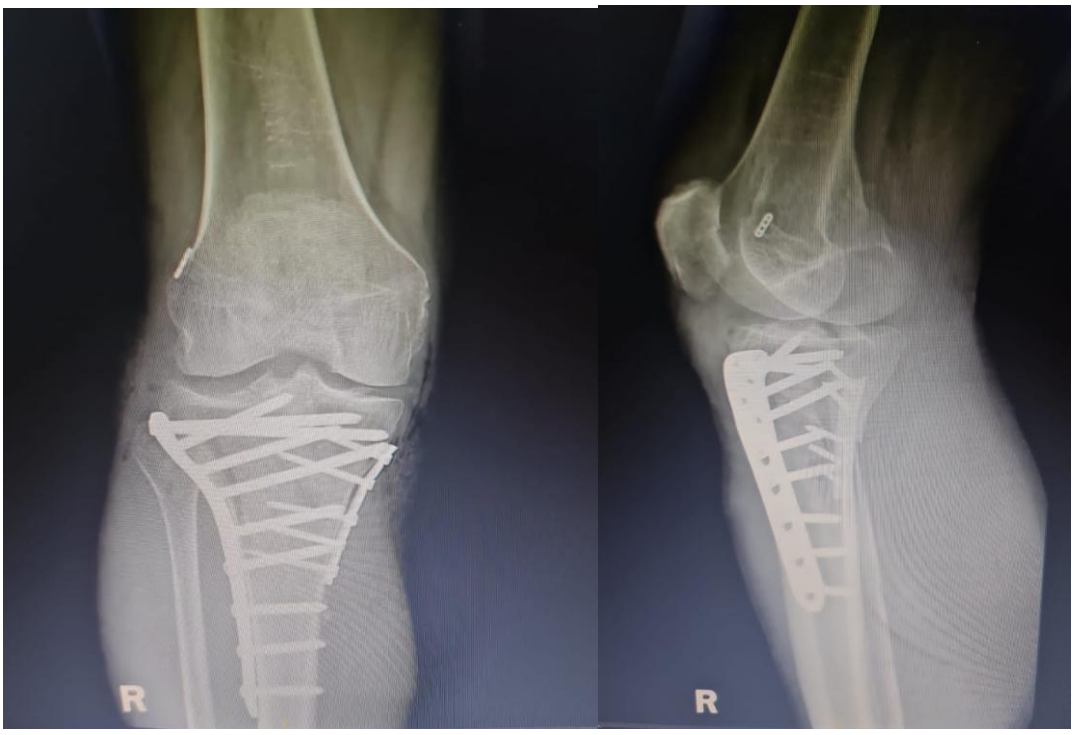

Figure 2. Post-operative x-ray from anterior and lateral that showed the plates and screws location at the tibial plateau

Postoperatively, the patient was stable, with controlled pain (VAS 2-3) and no additional complaints. Dressing was dry with no leakage. Active Range of Motion (ROM) of the distal joints was good, with normal dorsiflexion of the ankle and great toe. International Knee Documentation Committee (IKDC) knee score was 100%. Lachman test and anterior drawer test showed negative result. The patient was commenced on a regimen of ceftriaxone, analgesics, and wound care as needed. The limb was elevated using a pillow, and a blood transfusion was planned if the Hemoglobin level dropped below 10 g/dL. The patient was advised to begin active

ROM exercises of the distal limb, and arrangements were made for physiotherapy consultation and non-weight-bearing mobilization using crutches. Bladder training was also initiated.

The patient's progress will continue to be monitored closely in the subsequent follow-up visits, with the ultimate goal of restoring full function and preventing long-term complications.

DISCUSSION

The patient in this case presented with a Schatzker type VI tibial plateau fracture, a high-energy injury often associated with significant soft tissue damage, including ACL.[2] The occurrence of an ACL injury in conjunction with a tibial plateau fracture is not uncommon. Studies suggest that ligamentous injuries are more likely as the Schatzker classification of the tibial plateau fracture advances.[4]

The management of such cases requires a meticulous and multi-faceted approach given the complexity of the injury and the potential for long-term complications. Our treatment strategy involved the ORIF technique with plate and screws for the tibial plateau fracture, and additional measures to address the ACL injury. Similar strategies have been noted in the literature, with some studies indicating the efficacy of circular external fixators for complex Schatzker type VI fractures as they allow for early mobilization, infection prevention, and improved union rate.[5,6]

In the present case, the patient had a prior history of an ACL reconstruction, which added an extra layer of complexity to the management of his injuries. The pre-existing ACL reconstruction could potentially impact both the surgical approach and the post-operative recovery, underscoring the importance of individualized treatment plans.

Following surgery, the patient was stable, and his pain was well-controlled. He was commenced on active ROM exercises for the distal joints and was advised on non-weight-bearing mobilization using crutches. These measures are crucial to prevent joint stiffness and muscle atrophy, promote circulation, and aid in the overall recovery process.[7,8]

The prognosis and functional outcomes for patients with Schatzker type VI tibial plateau fractures and concurrent ACL injuries are largely dependent on the initial injury severity, the presence of any associated injuries, the quality of surgical treatment, and the effectiveness of postoperative rehabilitation. IKDC can be used to measure symptom and knee articulation (SKA) and also activity level (AL). Both parameters had good internal consistency (0.87 for SKA; 0.88 for AL).[9]

CONCLUSION

In conclusion, ORIF plates and screws gave a good result in managing complex Schatzker type VI tibial plateau fractures associated with ACL injuries. The prognosis and functional outcomes for patients with Schatzker type VI tibial plateau fractures and concurrent ACL injuries are largely dependent on the initial injury severity, the presence of any associated injuries, the quality of surgical treatment, and the effectiveness of postoperative rehabilitation. IKDC before and after surgery may help determining the prognosis and understand the patient From's goal. Further research was needed in bigger sample population and longer follow-up duration so we can assess the functional and clinical.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: No conflicts of interest declared.

REFERENCES

1. Bertrand ML, Pascual-López FJ, Guerado E. Severe tibial plateau fractures (schatzker V–VI): Open reduction and internal fixation versus hybrid external fixation. Injury. 2017;48. doi:10.1016/s0020-1383(17)30799-4
2. Cho K-Y, Oh H-S, Yoo J-H, Kim D-H, Cho Y-J, Kim K-I. Treatment of schatzker type

V and vi tibial plateau fractures using a midline longitudinal incision and dual plating. Knee Surgery & Related Research. 2013;25(2):77–83. doi:10.5792/ksrr.2013.25.2.77

3. Pun TB, Krishnamoorthy VP, Poonnoose PM, Oommen AT, Korula RJ. Outcome of Schatzker type V and VI tibial plateau fractures. Indian J Orthop. 2014 Jan;48(1):35-41. doi: 10.4103/0019-5413.125490. PMID: 24600061; PMCID: PMC3931151.
4. Porrino J, Richardson ML, Hovis K, Twaddle B, Gee A. Association of Tibial Plateau Fracture Morphology with Ligament Disruption in the Context of Multiligament Knee Injury. Curr Probl Diagn Radiol. 2018 Nov;47(6):410-416. doi: 10.1067/j.cpradiol.2017.09.001. Epub 2017 Sep 12. PMID: 28992997.
5. Bove F, Sala F, Capitani P, Thabet AM, Scita V, Spagnolo R. Treatment of fractures of the tibial plateau (Schatzker VI) with external fixators versus plate osteosynthesis. Injury. 2018 Nov;49 Suppl 3:S12-S18. doi: 10.1016/j.injury.2018.09.059. PMID: 30415663.
6. Malik S, Herron T, Mabrouk A, et al. Tibial Plateau Fractures. [Updated 2023 Feb 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470593/
7. Prat-Fabregat S, Camacho-Carrasco P. Treatment strategy for tibial plateau fractures: an update. EFORT Open Rev. 2017 Mar 13;1(5):225-232. doi: 10.1302/2058-5241.1.000031. PMID: 28461952; PMCID: PMC5367528.
8. Dávila Castrodad IM, Recai TM, Abraham MM, Etcheson JI, Mohamed NS, Edalatpour A, Delanois RE. Rehabilitation protocols following total knee arthroplasty: a review of study designs and outcome measures. Ann Transl Med. 2019 Oct;7(Suppl 7): S255. doi: 10.21037/atm.2019.08.15. PMID: 31728379; PMCID: PMC6829007.
9. Higgins LD, Taylor MK, Park D, Ghodadra N, Marchant M, Pietrobon R, Cook C; International Knee Documentation Committee. Reliability and validity of the International Knee Documentation Committee (IKDC) Subjective Knee Form. Joint Bone Spine. 2007 Dec;74(6):594-9. doi: 10.1016/j.jbspin.2007.01.036. Epub 2007 Aug 6. PMID: 17888709.

How to cite this article: I Gusti Ngurah Wien Aryana, Gede Agastya Pracheta Ewari. Management of complex Schatzker type VI tibial plateau fracture with concurrent ACL injury in a patient with prior ACL reconstruction: a case report. *International Journal of Research and Review*. 2025; 12(6): 320-324. DOI: *10.52403/ijrr.20250638*

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