



Case Report: Unique Fixation Technique For A Rare Case of Combined ACL & PCL Fragment Avulsion Fracture With Concomitant MCL Tear

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Introduction

- 52-year-old male who sustained a large, displaced tibial spine avulsion involving the ACL, PCL, posterior horn of the medial meniscus, and anterior horn of the lateral meniscus, with a concomitant near-complete MCL tear, following a seizure-related fall
- Avulsion fractures of the tibial spine with a fragment containing the insertion of both the ACL & PCL are rare
 - Concomitant MCL tear is even more uncommon
 - The mechanism of injury not being a high-energy trauma makes this case incredibly rare
- The rarity of this injury has resulted in inconclusive evidence for a definitive treatment approach
- Given the severity of this injury and its negative impact on a patient's quality of life, it is important to find a way to repair this injury in a way that facilitates return to normal activities of daily living
- This case presentation offers a novel approach to surgical management of combined ACL/PCL avulsion fractures for consideration by orthopedic surgeons.

Case Summary

- The patient is a 52-year-old male who presented with severe right knee pain and inability to bear weight after experiencing a seizure and falling down a flight of stairs.
- Physical exam revealed moderate swelling of the right knee and ankle, with positive anterior drawer, posterior drawer, and valgus stress tests.
- CT imaging demonstrated a tibial spine fracture, and MRI confirmed a proximal tibial fracture involving the ACL and PCL footprints with up to 6 mm of articular surface offset.
 - Additional MRI findings included a near-complete MCL tear and a probable horizontal tear of the medial meniscus at the junction of the body and posterior horn.

Intervention

Surgical Management:

- A fully arthroscopic approach was performed.
- The avulsed fragment was anatomically reduced and stabilized using a transosseous equivalent fixation technique with dual posterior fixation converging to an anterior tension point.
- The ACL was reinforced to address potential inter-ligamentous lengthening.
- The MCL was repaired directly using a horizontal suture construct placed proximally and distally under controlled joint positioning.

Postoperative Course:

- The patient began physical therapy early in the postoperative period.
- By 2 weeks post-op, he reported resolution of knee pain and demonstrated progressive functional improvement.
- At 6 months, he had regained full pain-free function in daily activities, with stable ligamentous exam findings.
- He returned to work by 7 months postoperatively, earlier than anticipated.

Discussion

- This case presents a rare and complex injury involving an ACL/PCL tibial spine fracture with a concurrent MCL tear.
- A fully arthroscopic transosseous equivalent fixation technique was employed, providing superior compression and healing potential compared to conventional screw fixation, with internal bracing enhancing postoperative stability.
- Literature review revealed only 9 prior combined ACL/PCL avulsion cases; only two utilized complete arthroscopic repair, and none mirrored the intact single-fragment pattern with concurrent MCL injury described here.¹⁻²
- This case contributes novel insights into arthroscopic management of complex tibial spine avulsions, demonstrating rapid recovery—pain resolution within 2 weeks and full return to activities by 6 months.

References

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*Complete reference list is available upon request

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Images

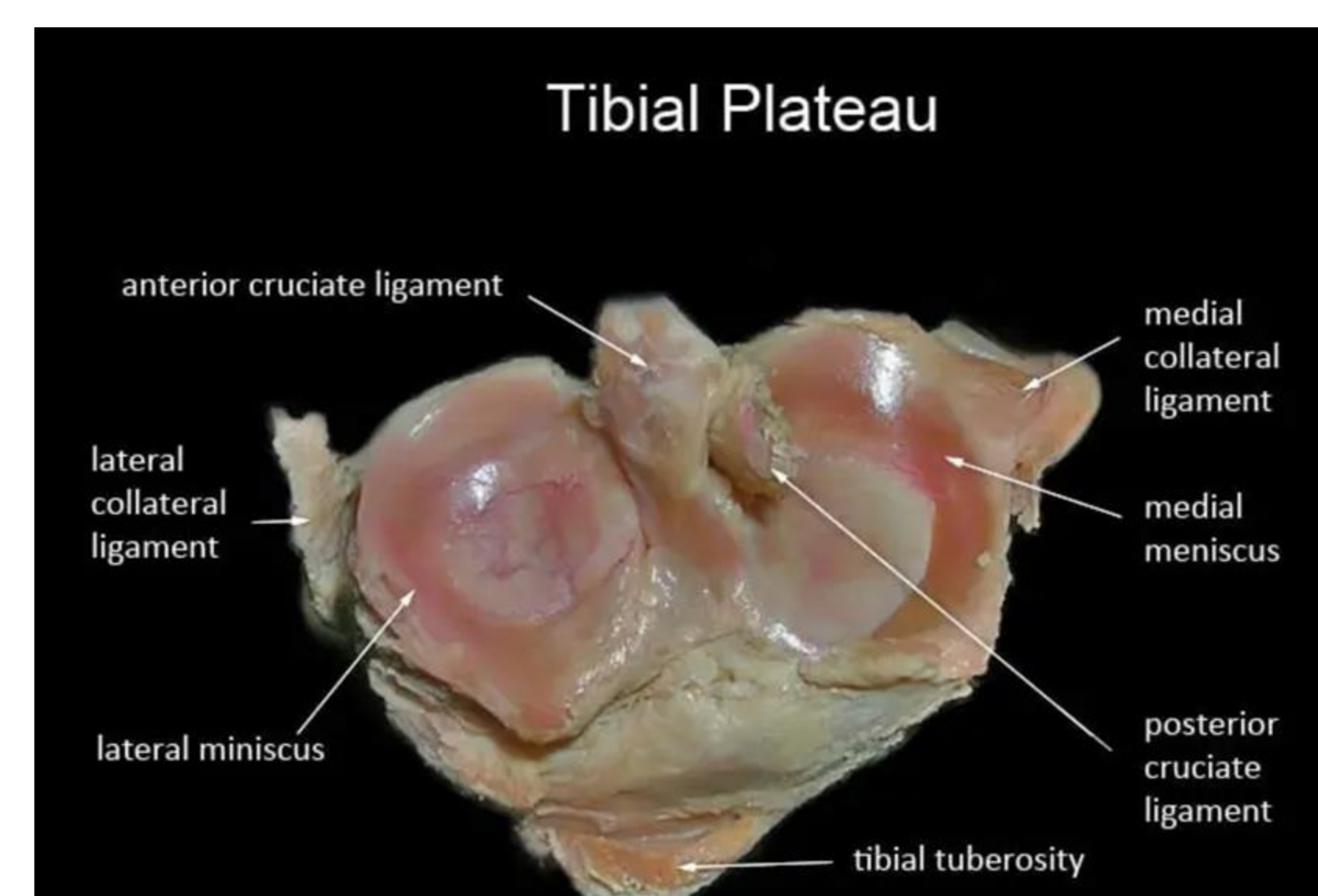


Figure 1. Anatomy of tibial plateau with ligament and meniscus attachments

