

Abstract

A 31 year old female patient presented to the clinic following the repair of a tibial plateau fracture. The fracture was the result of a fall during ski lessons that placed a rotational force on the patient's knee. The rotational forces put on the knee resulted in an avulsion of the anterior cruciate ligament (ACL) in her right knee. The patient had no previous history of injury to her right knee. ACL injuries are commonly accompanied by other knee injuries such as meniscal tears or medial collateral ligament injury. A less common accompanying injury is a tibial plateau fracture. This type of injury occurs when the ACL is stressed and tears a piece of bone away at the distal attachment at the anterior tibial spine. The difficulty with this sort of ACL injury is that it requires immobilization following the surgical repair. A normal ACL reconstruction has patients working on range of motion (ROM) exercises within a day of surgery to prevent stiffness. The immobilization of the knee following a tibial plateau fracture often leads to the development of severe knee stiffness caused by the formation of arthrofibrosis. This is an uncommon injury and often has a poor prognosis and very long recovery. This case study will present one of the most common problems associated with a tibial plateau fracture and describe some of the treatments available. It is important for clinicians to be aware of the different treatment options to help prevent and treat knee stiffness following this sort of injury. This case study will add to the limited literature available on tibial plateau fractures and common problems associated with them.

Introduction

In this case report the patient was injured while on vacation. During a ski lesson she fell and a rotational force was placed on her right knee. The fall produced immediate, severe pain and she was taken to the local emergency room where x-rays showed that she had an avulsion fracture of her tibial spine. Upon her return home, the patient underwent arthroscopic reduction and fixation of the tibial spine and debridement of the medial meniscus. She was then placed in a hinged knee brace set to 0°. She was instructed that she would be non-weight bearing (NWB) for 6-8 weeks and that she should begin gentle active assistive ROM exercises. At 8 weeks, she began outpatient physical therapy. It soon became clear that she had developed arthrofibrosis which required joint mobilizations, manipulation under anesthesia (MUA), and home passive range of motion devices to break up the adhesions.

Purpose

This case highlights complications that can occur following a tibial spine avulsion fracture. This will increase awareness of the development of arthrofibrosis and describe various treatment options following this rare injury.

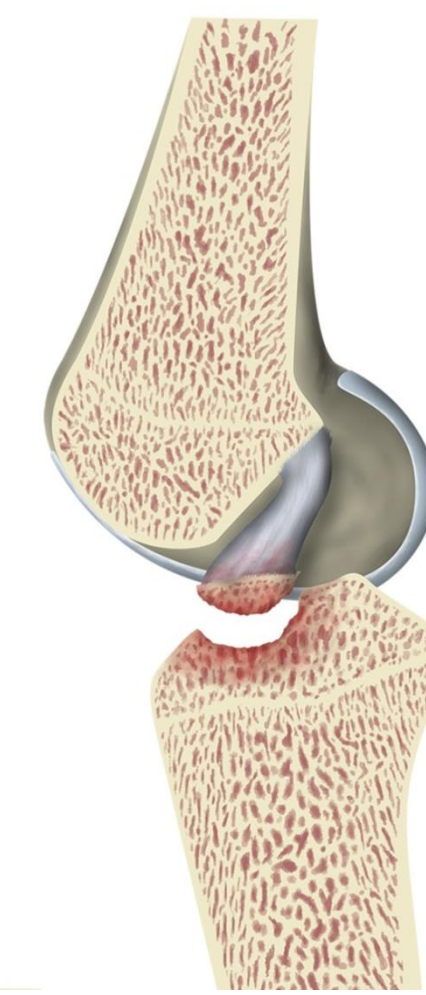
Background

- 31-year old female
- 5'2" and 115 lbs.
- No history of prior knee injury or deficits
- Patient is management with a car rental company

Clinical Presentation

- S/P repair of tibial plateau avulsion involving the ACL
- S/P medial meniscus debridement
- Presented to physical therapy on crutches (NWB) and in a hinged knee brace that has been set at 15° of flexion
- Incisions are well healed
- Sensation is intact
- Right quadriceps atrophy

| | ROM (degrees) | | MMT | |
|-------|---------------|-----------|------------|------------|
| | Flexion | Extension | Quadriceps | Hamstrings |
| Left | 140 | 0 | 5/5 | 5/5 |
| Right | 40 | -15 | 2+/5 | 3/5 |



Differential Diagnosis

- Adhesions following surgery
- Quadriceps and hamstrings weakness

Treatment

The patient immediately began strength and ROM exercises following the surgeon's protocol for both ACLR and tibial plateau fracture. She began partial weight bearing at 9 weeks when she had regained more quadriceps control and progressed to full-weight bearing by 10 weeks. Joint mobilizations and high-intensity stretches were performed to help break up the adhesions that had developed around her knee. 6 months post-op, the patient was still severely lacking ROM (PROM 10-80°). A MUA was performed and the ROM achieved was 0-125°. The patient was given a continuous passive motion machine and resumed therapy 2 days later. 10 months post-op, the patient had AROM of 5-115° and PROM of 0-120°. The PROM was only achieved with severe pain and could not be maintained more than a few hours. The surgeon prescribed the ERMI knee flexionator and extensionator high-intensity stretch (HIS) devices for home use. 12 months post-op, there have been no more gains in AROM. Arthrolysis, a surgical excision of adhesions, is being discussed.

Uniqueness

This case follows an uncommon injury and displays one of the complications frequently associated with it. Knee stiffness is one of the biggest patient complaints following tibial plateau fractures. It was more common following this injury in the past because patients were casted following surgery. Most surgeons now use knee immobilizers and locking hinged braces that allow for earlier mobilization. This patient's case of arthrofibrosis was made worse by an improperly set brace. Changing the lock from 0° to 15° contributed to her extension lag by allowing the adhesions to form about the knee while it was flexed. This patient's fear of re-injury during rehabilitation also contributed to her ROM deficits. Her non-compliance with AAROM at home allowed the knee to stiffen up prior to beginning outpatient therapy. There are a variety of treatment options that can be used to break up the adhesions after the fracture has healed. Most of these options have already been used in this



Conclusion

This case report presents the treatment of an uncommon injury that was fixed, but developed other complications. With tibial plateau fractures, it is not uncommon for knee stiffness to occur because many surgeons' protocols call for immobilization following surgery. This patient's risk for developing arthrofibrosis was compounded by her non-compliance due to fear and improperly fitted equipment. This emphasizes the significance of athletic trainers, physical therapists, and surgeons stressing to their patients the importance of compliance with therapy, whether at home, an outpatient clinic, or in an athletic training facility. This case also displays the importance of educating patients about their injury and/or surgery. This patient may have been less fearful, more compliant, and not have developed arthrofibrosis if she had been better informed. It also serves as a reminder to check all patients equipment. A simple fix of someone else's mistake could have prevented a this patient from a great deal of pain and suffering if had been caught earlier.