

Proximal Tibiofibular Joint Dislocation and Successful Surgical Treatment with a Double Spanning Diverging Suture Technique

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BACKGROUND

- Rates of proximal tibiofibular joint (PTFJ) dislocation remain rare, making up approximately 1% of all knee injuries.^{1,2}
- Commonly associated injuries with PTFJ dislocation include lateral meniscus tear, lateral tibial plateau and shaft fractures, and common peroneal nerve injury.^{3,4}
- Exam findings include prominence and tenderness of the fibular head, pain with weight-bearing that worsens with squatting, and altered sensation over the common peroneal nerve distribution.⁵
- Flexible suture fixation has been successful in avoiding rigid constructs, second surgeries to remove fixation devices, and maintaining the natural mechanics of the joint.

CASE PRESENTATION

- 34-year-old male professional skier with sharp left lateral knee pain after contusing lateral knee with the blunt end of a metal railing during a ski jump.
- Worse with squatting and descending stairs.
- Physical exam revealed mild tenderness over the lateral joint line, exquisite tenderness over the proximal fibular head, and a hypermobile and easily subluxated left PTFJ.
- Plain film radiographs of the left knee were unremarkable.
- Left knee MRI revealed a small radial tear at the lateral meniscus and a horizontally oriented PTFJ with edema over the proximal tibia cephalad to the proximal tibiofibular articulation and chondral irregularities on the tibial facet (Figure 1).

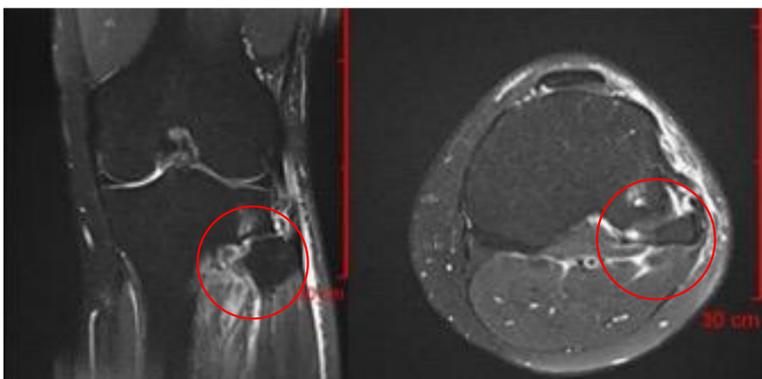


Figure 1. Coronal and transverse MRI views of the patient's injured left knee. The image shows an increased signal in the proximal tibial facet and surrounding soft tissues.

SURGICAL TECHNIQUE

- Lateral incision was made centered on the lateral epicondyle and fibular head.
- Dissection was carried out to the fibular head while carefully palpating and protecting the common peroneal nerve.
- With the joint manually reduced, a guidewire was placed across the posterior tibiofibular joint with the pin exiting the anteromedial tibial cortex.
- After over drilling with a cannulated drill, a flexible suture was used for fixation and the button was ensured to be on the tibial cortex.
- A second anchor was then placed across the joint more anteriorly using a similar technique with the flexible suture fixation device button exiting the medial tibial cortex adjacent to the tibial tubercle.
- With both anchors loosely in place, they were gently tensioned, eliminating the gross mobility of the PTFJ.
- This technique resulted in two diverging sutures spanning the joint (Figures 2 and 3).

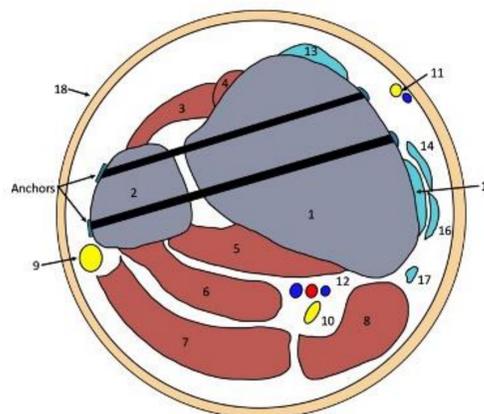


Figure 2. Cross-section diagram of the left proximal tibiofibular joint showing the placement of the flexible suture fixation device indicated by the black lines and blue rectangles on the tibia and fibula. Basic anatomy of the joint is also included showing 1) tibia, 2) fibula, 3) extensor digitorum longus, 4) tibialis anterior, 5) tibialis posterior, 6) soleus, 7) lateral head of gastroc, 8) medial head of gastroc, 9) common peroneal nerve, 10) tibial nerve, 11) saphenous nerve and vein, 12) posterior tibial artery and veins, 13) patellar tendon, 14) sartorius, 15) medial collateral ligament, 16) semitendinosus tendon, 17) gracilis tendon, and 18) skin envelope.



Figure 3. AP and lateral postoperative plain film radiographs of the left knee. Metallic implants can be seen on both the fibular head and medial aspect of the proximal tibia. The implants are slightly offset vertically to increase stability.

DISCUSSION

- Patient recovered with no complications and was able to return to his pre-injury level of activity.
- The double-spanning suture fixation technique eliminates a rotational axis that could be seen with a single suture button or non-diverging angle, reducing the risk of unwarranted movement while also avoiding the need for a second surgery to remove fixation devices.
- There should be high suspicion for a PTFJ dislocation when there is an instance of trauma to the lateral aspect of the knee or when the patient is involved in sporting activities with high-intensity cutting and pivoting movements.
- Chronic dislocations can often be initially mistaken for an isolated lateral meniscus tear due to their anatomic proximity and similarity in symptoms, including pain near the lateral joint line, pain with squatting, and catching sensations.⁶
- Initial treatment of acute PTFJ dislocation is closed reduction of the joint under intravenous sedation or with a local anesthetic.¹
- In the cases of chronic instability, proposed treatments include arthrodesis with fibular osteotomy, temporary and permanent screw fixation,⁵ autograft reconstruction,⁷ and temporary fixation with Kirschner wires^{2,8}, but optimal surgical treatment is currently unknown given the rarity of the injury and a lack of controlled studies.

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