

Review Article

Proximal tibiofibular joint: Rendezvous with a forgotten articulation

Amitav Sarma, Bhaskar Borgohain¹, Bishwajeet Saikia

ABSTRACT

The proximal tibiofibular joint (PTFJ) is a plane type synovial joint. The primary function of the PTFJ is dissipation of torsional stresses applied at the ankle and the lateral tibial bending moments besides a very significant tensile, rather than compressive weight bearing. Though rare, early diagnosis and treatment of the PTFJ dislocation are essential to prevent chronic joint instability and extensive surgical intervention to restore normal PTFJ biomechanics, ankle and knee function, especially in athletes prone to such injuries. PTFJ dislocations often remain undiagnosed in polytrauma scenario with ipsilateral tibial fracture due to the absence of specific signs and symptoms of PTFJ injury. Standard orthopedic textbooks generally describe no specific tests or radiological signs for assessment of the integrity of this joint. The aim of this paper was to review the relevant clinical anatomy, biomechanics and traumatic pathology of PTFJ with its effect on the knee emphasizing the importance of early diagnosis through a high index of suspicion. Dislocation of the joint may have serious implications for the knee joint stability since fibular collateral ligament and posterolateral ligament complex is attached to the upper end of the fibula. Any high energy knee injury with peroneal nerve palsy should immediately raise the suspicion of PTFJ dislocation especially if the mechanism of injury involved knee twisting in flexion beyond 80° and in such cases a comparative radiograph of the contralateral side should be performed. Wider clinical awareness can avoid both embarrassingly extensive surgeries due to diagnostic delays or unnecessary overtreatment due to misinformation on the part of the treating surgeon.

Key words: Biomechanics, dislocations, knee injury, proximal tibiofibular joint

Mesh terms: Biomechanics, dislocation, knee injuries

INTRODUCTION

The human proximal tibiofibular joint (PTFJ) mechanics has been largely unknown due to lack of attention by both the clinicians and the anatomists alike. It is a plane type of synovial joint composed of the tibial facet on the posterolateral aspect of the tibial condyle and the fibular facet on the medial upper surfaces of the head of the fibula. There is a considerable amount of anatomical as well as, biomechanical variation in this joint as described earlier.^{1,2} It was hypothesized by Lambert that

one-sixth of static load applied at the ankle was transmitted along the fibula.³ We present a brief discussion on the PTFJ for a better understanding of the clinicoanatomical aspects of this rather neglected joint.

MATERIALS AND METHODS

PTFJ is not a common site for isolated injury and therefore surgeons' overall unfamiliarity may easily lead to missed injury. It can result in chronic knee pain and instability if not diagnosed and treated appropriately. The aim of this study was to review the relevant surgical anatomy, applied biomechanics and finally the diagnostic and therapeutic challenges in dealing with traumatic pathologies of the PTFJ. We wanted to define a pragmatic clinico-radiological approach that may potentially minimize the oft-quoted risks of a missed PTFJ dislocation since it is a rare injury. We also tried to propose logical and practical treatment algorithms in different clinical scenarios to restore near normal biomechanics of the joint based on our literature search.

Our review is based on literature search through open access sources on the Internet as well as manual searches from reputed journals and textbooks dealing with the topic in detail. The keywords used for internet search were PTFJ, PTFJ dislocation, instability of PTFJ, surgical

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anatomy of PTFJ, etc. The main search engines used were Google, Google Scholar, PubMed (English) and PubMed Central (Europe). Indexed and open access review articles on PTFJ were also studied. Most of the articles originally written in English were studied as full text and others were abstracts available in English. Altogether over 20 full text articles, 7 textbooks (Anatomy and Orthopaedics) and 5 comprehensive abstracts were finally found to be suitable to answer our primary questions. Abstracts were cited only when comprehensive and self explanatory abstracts were available online in PubMed. Cross references were taken from only a few articles.

Anatomy of the joint

The PTFJ is a plane type of synovial joint between the articular facet on the lateral condyle of the tibia and the facet on the head of the fibula. An articular capsule covers the joint which is attached just beyond the articular surfaces of the tibia and the fibula being strengthened further by the anterior and posterior proximal tibiofibular ligaments. Interestingly, the synovial membrane lines the articular capsule which may communicate with the knee joint via the subpopliteal recess in about 10% of the population. The articular facets vary in size, form, and inclination. The axis of the joint may be transverse or oblique. The fibular facet is usually elliptical or circular and nearly flat or slightly grooved. The surfaces are covered with hyaline cartilage underlining the synovial nature of this joint.⁴

Ogden, in 1974, developed a simple anatomical classification of the PTFJs.^{5,6} He studied and classified two types of joints: “horizontal” and “oblique” [Figure 1a and b]. The “horizontal” joint is planar, slightly concave, circular in shape and is found behind a projection of the lateral edge of the tibia, while the “oblique” joint has a smaller articular surface averaging between 10 and 20 mm². The surface area of the “oblique” joints is more variable, as one half of the surface areas is planar and the other half are either slightly convex or concave. Barnett and

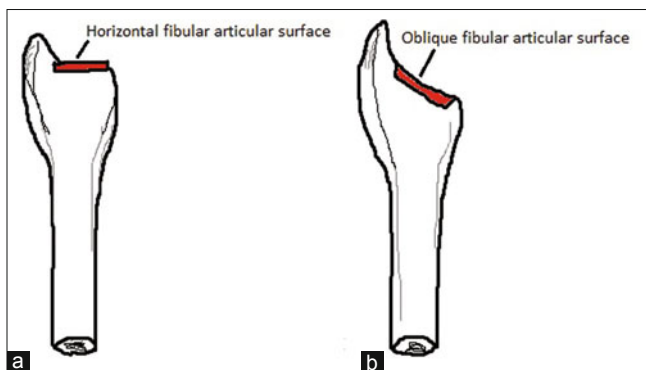


Figure 1: A line diagram showing (a) Horizontal type of proximal tibiofibular joint. (b) Oblique type of proximal tibiofibular joint

Napier,¹ on the other hand, described three types of joints. In Type I, the tibial articular surface is large, planar and circular in shape and the inclination of the joint is nearly horizontal. In Type II joints, there are moderately large tibial articular surfaces that are elliptical in shape. In Type III, PTFJs have smaller, planar and irregular articular surfaces and have greater inclination to the horizontal plane than Type I. Eichenblat and Nathan⁷ developed a classification system from their study of the fibula, tibia and PTFJ in 489 dry bones, 50 cadaveric knees and 1 clinical case. The type of joints were classified into seven categories: Plane (33.55%), trochoid (29.57%), double trochoid (22.59%), condylar (4.65%), saddle (2.32%), trochlear (.86%) and ball and socket (.67%). The majority of the trochoid had concave fibular (82%) and convex tibial (78%) articular surfaces. There are several other soft tissue stabilizers that strengthen this joint. The interosseous membrane provides additional support to the joint by connecting the shaft of the tibia and fibula. The joint is strengthened anteriorly by the tendon of the biceps femoris inserting into the fibular head. The tendon of the popliteus muscle reinforces the capsule posteriorly. Additional support is provided by the fibular collateral ligament superiorly and the interosseous membrane inferiorly.⁸

Vascular supply, innervations and important relations

The principal arterial supply of the joint is by the anterior tibial recurrent and posterior tibial recurrent branches of the anterior tibial artery. The joint is innervated by the common peroneal nerve and the nerve to the popliteus, branches of the tibial nerve. Common peroneal nerve passes to the head of the fibula medial to the tendon of the biceps femoris lies very close to the capsular ligament. The anterior tibial artery, posterior tibial artery (branches of the popliteal artery) and peroneal artery branch of the posterior tibial artery lie on the inferomedial side of the joint.⁴

Biomechanics of the joint

Literature describing the biomechanics of the PTFJ are relatively rare. The primary function of the joint was defined by Ogden as dissipation of torsional stresses applied at the ankle, dissipation of lateral tibial bending moments and tensile, rather than compressive weight bearing.⁵ Evans and Band's stated that the proximal fibula was involved in tensile forces rather than compressive ones and that the proximal and middle one-third of the fibula has greater tensile strength than femur.⁹ Slight gliding movement is possible at the PTFJ during the movements of the ankle joint. Through the interosseous membrane and the distal tibiofibular syndesmosis, the tibia and fibula move relatively to each other at the PTFJ.^{6,7,10,11} During dorsiflexion of the ankle, the proximal fibula is known to externally rotate at the PTFJ.^{6,7,10,11} Lambert³

has described earlier that one of the functions of PTFJ is the indulgence of torsional stresses applied at the ankle joint. In one of the earlier studies,⁵ it was observed that there is an increased amount of rotation of the fibula at the PTFJ in horizontal variants than the oblique variants. During the flexion of the knee, gliding movement was observed in the anterior-posterior axis at the PTFJ and as the knee flexes, the proximal fibula moves anteriorly with relative relaxation of the fibular collateral ligament and the biceps femoris while with knee extension, these structures become taut and pull the fibula posteriorly.^{5,11} Andersen¹¹ described that the fibula rotates laterally during the dorsiflexion of the ankle joint. All the tibiofibular joints make up a compensatory system that allows a slight upward movement of the fibula due to forced transverse expansion of the malleolar mortise during maximal dorsiflexion of the ankle.⁸ During the fluoroscopic study, Ogden⁵ demonstrated fibular rotation with ankle dorsiflexion and in addition, he found that there appeared to be more external rotation in the horizontal type than in the oblique type of PTFJ. Barnett and Napier¹ described the rotation of the horizontal type of PTFJ similar to the rotation at the radio-humeral joint. They also described the relationship between the anatomical shape of the PTFJ and progressive ranges of dorsiflexion of the ankle. They described Type I (horizontal) joints as having large, freely moving articulations which are associated with a high dorsiflexion axis inclination in the ankle. On the other hand, Type III (oblique) joints are small immobile joints associated with low inclination of the dorsiflexion axis.

SURGICAL AND APPLIED ANATOMY OF PROXIMAL TIBIOFIBULAR JOINT

The PTFJ is seldom discussed in the literature, as the cause of knee dysfunctions. The stability of the PTFJ can be attributed to the good ligamentous support around it. This is appreciated especially during extension of the knee. An unstable knee is seen when it is held in flexion with the foot is internally rotated and plantar flexed. Dislocations of the knee occur typically in this position.¹² The pathologies of the PTFJ as described by Ogden include subluxation (Type I), anterolateral dislocation (Type II), posteromedial dislocation (Type III), and superior dislocation (Type IV).⁶ Anterolateral or Type II dislocation is by far the most frequent variety, about 85% [Figure 2a] and often associated with ligamentous injury and peroneal nerve palsy. Type III injury [Figure 2b] is associated with a transient common peroneal nerve injury whereas, Type IV dislocation [Figure 3a] is rare and is most often associated with common peroneal injury and usually caused by high energy ankle injuries.⁵ Mechanisms of injury reported in the literature include twisting injuries,

slipping injuries where the patient lands on his knee which is flexed under his body on multiple trauma and parachute landings.⁵ Subluxations [Figure 3b] are prone to occur with generalized ligamentous laxity, muscular dystrophy or are posttraumatic following dislocation.^{5,11} From these observations, it may be extrapolated that in any knee injury accompanied by common peroneal nerve injury, occult PTFJ dislocation or subluxation should be clinically suspected and ruled out. A subtle or frank clinical findings of common peroneal nerve injury, lateral knee pain, and appreciable toggling of the fibular head may suggest an occult PTFJ dislocation in high-energy knee injuries; especially between 20 and 40 years of age if the mechanism of injury involved knee twisting inflexion beyond 80° typically with the foot is rotated and plantar flexed.

The anterior tibial vessels and the anterior peroneal vessels pass through the oval apertures in the superior and distal aspects of the interosseous membrane, respectively.¹³ The common peroneal nerve or lateral popliteal nerve is in close relation to the PTFJ as it passes posteriorly over the head of the fibula. Very importantly, inferolateral dislocation of the PTFJ is usually associated with popliteal artery transection and common peroneal nerve palsy. Gabrion *et al.*¹⁴ described the inferior dislocation produced by high-energy mechanisms; which were associated with tibial fracture and serious vascular injuries. Veerappa and Gopalakrishna¹⁵ reported that inferior translatory movement of the fibular head occurs due to the shearing force on the fibula in relation to the tibia which causes disruption of the interosseous membrane and the anterior part of the distal tibiofibular ligament. It causes the stretching of the peroneal nerve which is related to the neck of the fibula and even the vessels might get injured as they are lying close to the interosseous membrane.

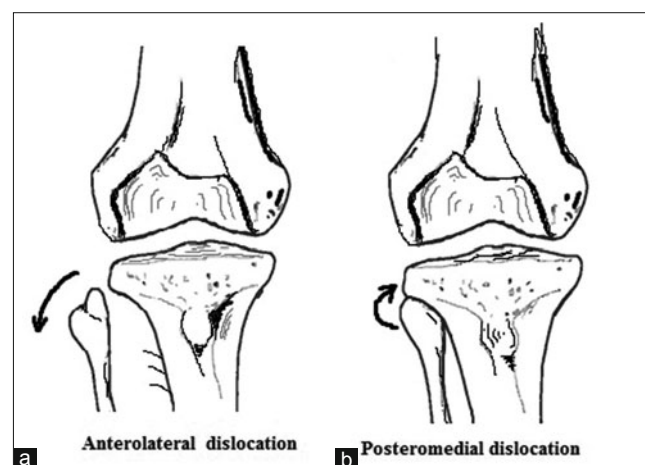


Figure 2: A line diagram showing (a) Anterolateral dislocation of the proximal tibiofibular joint. (b) Posteromedial dislocation of the proximal tibiofibular joint

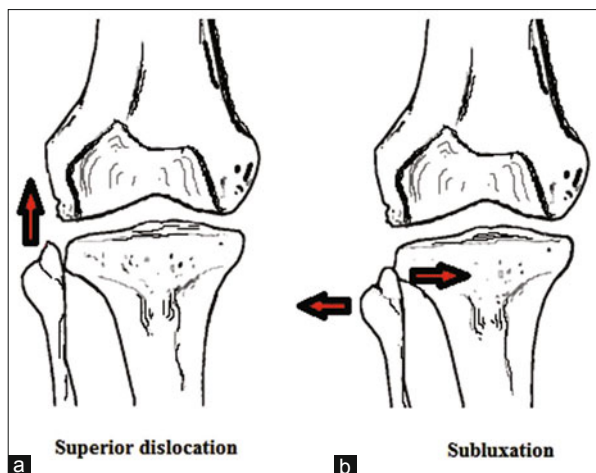


Figure 3: A line diagram showing (a) Superior dislocation of proximal tibiofibular joint. (b) Subluxation of proximal tibiofibular joint

In polytrauma patients with ipsilateral tibial fracture, proximal tibiofibular dislocation may be easily missed. The anterior and posterior capsular ligaments and the lateral collateral ligament may get involved in the pathologies of the PTFJ, which may influence the biomechanics and thus the movements at the PTFJ.^{16,17} It can easily go unnoticed^{5,18-23} due to the absence of specific signs and symptoms in the physical examination and the conventional radiology may not provide useful findings. That is why, some of the authors^{5,16,23} mentioned about the necessity of specific imaging studies, such as computed tomography (CT) or comparative X-rays to establish the diagnosis.^{5,16,23} Gabrion *et al.* mentioned that superior dislocations most often caused common peroneal nerve injury.¹⁴ Ares *et al.*,²⁴ in their case report, mentioned about the common peroneal nerve injury associated with the anterolateral type of dislocation of the PTFJ.

Many authors had stressed the importance of providing early treatment for PTFJ dislocation to prevent chronic joint instability.^{14,18,21-23} Usually, in cases of PTFJ dislocation associated with a tibial fracture, the reduction of the tibial fracture is done first and the tibiofibular dislocation gets reduced by itself.^{19,25,26} To provide stability during healing, a proximal tibiofibular screw^{14,18,22,23,27} or K-wire^{21,23} can be used to hold the unstable PTFJ reduction. There is no clear consensus on K-wire versus screw fixation after open reduction. In the delayed diagnosis of PTFJ dislocation, treatment options are salvage procedures like the removal of the fibular head^{20,22} or osteotomy.¹⁸ Some authors vividly describe PTFJ dislocation as the “Monteggia injury of the leg”²⁷ and Maisonneuve fracture equivalent²⁸ to highlight this injury. Comparison film of the normal side may be useful for making a correct diagnosis.²⁸ Tenodesis using

hamstrings tendon may also be done in the absence of other major ligament injuries. The authors encountered a missed PTFJ dislocation recently, in a high energy knee injury with partial anterior cruciate ligament (ACL) tear until magnetic resonance imaging (MRI) of the knee documented the dislocation. On retrospective review of the case file, the anterior drawer test was recorded as strongly positive suggesting a complete tear of ACL but this was perhaps due to some contribution from the PTFJ dislocation or an error of judgment by the first examiner. Anterior-posterior toggling of the fibular head with internal rotation during anterior translation of the proximal tibia tested later was evident at 90° knee flexion²⁸ in this case that corroborated with the MRI finding. Notably, the screw placed from fibular head to proximal tibia had to be planned carefully away from the proposed tibial tunnel for ACL reconstruction in this young man.

The detailed anatomy and the intricate biomechanics of the PTFJ have evolved rather recently.²⁹ Experimental PTFJ dislocation is possible when the knee is flexed past 80° when the fibular collateral ligament is relaxed or physically transected.^{28,30} PTFJ is not a common site for isolated injury and that makes the possibility of missing it easier. PTFJ dislocation associated with a tibial fracture in patients with polytrauma is rare, but because of its rarity this entity may easily go unnoticed, delaying the diagnosis. The dislocation may be isolated, particularly associated with horseback or parachuting activities or may be only one part of a complex high-energy injury of the lower extremity.³⁰ Although old literature reports peroneal nerve dysfunction is usually seen with posterior dislocations, and Lyle reported peroneal palsies in up to 5% of tibiofibular dislocations,³⁰ a subtle or frank clinical findings of common peroneal nerve injury, lateral knee pain, and appreciable toggling of the fibular head may suggest an occult PTFJ dislocation in high-energy knee injuries and we feel that these specific tests should be included in routine clinical examination of the knee injuries. A high index of suspicion is necessary which may be especially true between 20 and 40 years age group.²⁸ Comparison film of the normal side may be useful²⁸ but CT scan may make a correct diagnosis and document the dislocation.³⁰ Timely diagnosis and adequate reduction in 90° knee flexion are usually enough to regain stability and surgery is often not required in isolated dislocation.²⁸ Treatment with K-wire or a temporary tibiofibular screw fixation of the joint, carried out during definitive surgery for the ipsilateral tibial fracture can provide good long term results. Parkes and Zelko³¹ recommended open reduction and pin fixation using K-wire and immobilization for 6 weeks, after which the pins are removed, and range of motion is started. This strategy also applies to failed close reduction in isolated dislocation.

Fusion is not recommended since it interferes with normal ankle joint function.³⁰

CLINICAL TESTS FOR DIAGNOSIS OF PROXIMAL TIBIOFIBULAR JOINT INSTABILITY

The diagnosis of PTFJ instability is almost always based on a thorough clinical examination. In acute cases, it may be difficult to make the patient relax sufficiently to examine for PTFJ instability, but usually having the knee flexed to 90° and trying to perform an anterolateral subluxation maneuver of the joint is sufficient to confirm this diagnosis. In chronic injuries, the instability may appear obvious when the patient sits in squatting position.

It is important to compare the injured side to the normal contralateral side because some patients may have physiologic laxity of this joint. In more chronic cases, squatting can often demonstrate the subluxed PTFJ. Concurrent with this, a Tinel's test may be performed by percussing over the common peroneal nerve to confirm the presence of dysesthesias or "zingers," which translate down the leg.

The important structures attached to the head of the fibula are arcuate complex, tendon of biceps femoris, lateral collateral ligaments, popliteo-fibular ligament. The important structures related to the PTFJ are common peroneal nerve and popliteus tendon [Figure 4]. Various surgical corrections of chronic unstable PTFJs have been described in the literature, such as resection of the proximal end of the fibula, arthrodesis of the PTFJ with or without fibular osteotomy and different ligament reconstruction;^{9,17,32} however, all are associated with several problems and limitations. Weinert and Giachino ligament reconstruction

has been described for recurrent dislocation of this joint wherein the biceps tendon was split longitudinally.³³ The posterior one half was transected proximally and mobilized. Second, the free end of the graft was passed posterior to anterior through a tibial tunnel. Third, the tendon was sutured to the anterior tibial periosteum under tension with the fibular head reduced.

Tenodesis stabilizes the superior tibiofibular joint, preserves physiological function of the fibula and avoids complications of resection or arthrodesis like ankle pain, instability and a loss of ankle mobility, screw loosening or breakage or stress fracture of the fibula at the screw site.³³

Treatment of PTFJ dislocation should be conservative whenever appropriate.³⁴ When close reduction fails, open reduction should be performed with soft tissue reconstruction procedure to ensure stability and normal biomechanics at ankle.³⁴ We attempted to suggest the most logical treatment algorithms based on our review in acute, irreducible, and chronic or recurrent situations [Figures 5-7], although there is no clear consensus among authors. The management of Type I and II injuries is a reduction by anteroposterior pressure over the fibula head, with the knee slightly flexed, and the ankle everted. Reduction of Type III and IV injuries is more difficult and may require open reduction and fixation. Open reduction and internal fixation are the options available in the delayed treatment of the injury if associated injuries demand aggressive management. Arthrodesis with or without fibular osteotomy should be considered a salvage procedure. Postsurgical management includes immobilization of ankle and knee joints for 6 weeks in a nonweight bearing status, with temporary fixation devices removed between 6 and 12 weeks.

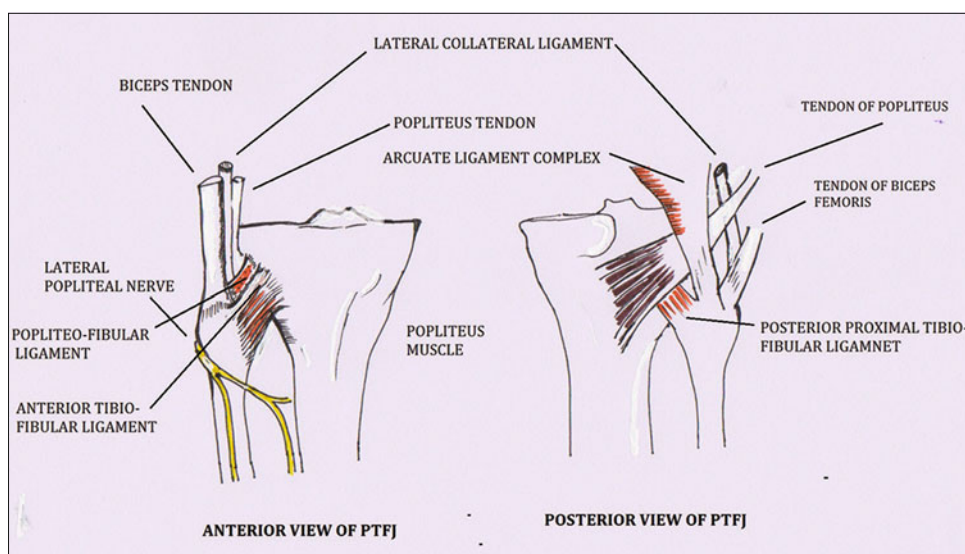


Figure 4: A line diagram showing anatomy of the proximal tibiofibular joint (anterior-posterior)

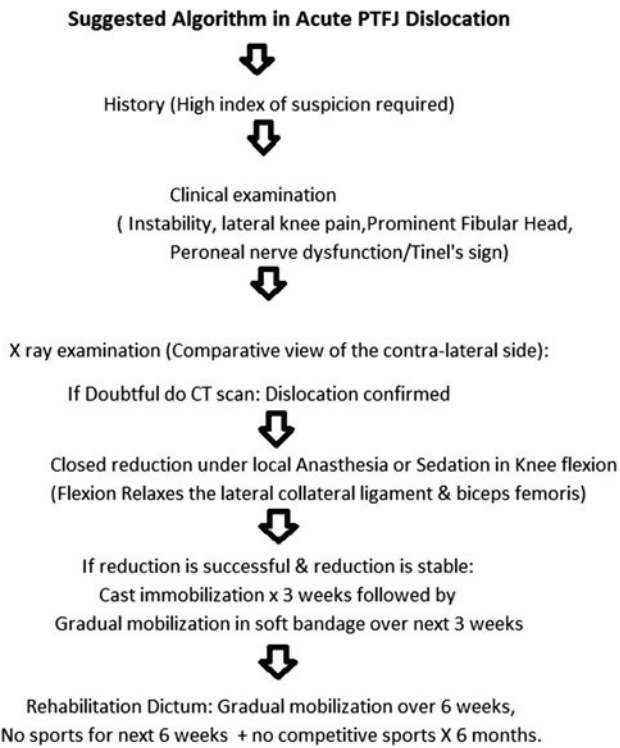


Figure 5: Treatment algorithm in acute proximal tibiofibular joint dislocation

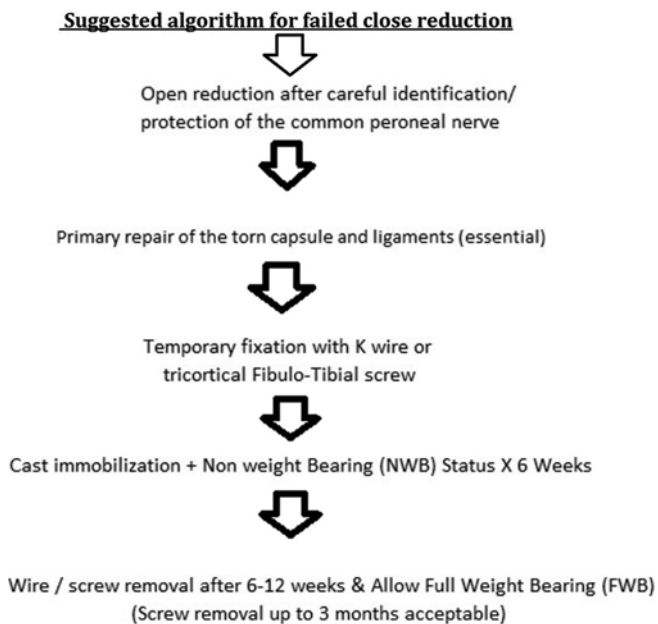


Figure 6: Treatment algorithm in failed close reduction

Gradual return to full weight bearing status and initiation of muscle strengthening and range of motion exercise can begin after fixation devices are removed.³⁴

Repair of the ligaments and capsule or tenodesis is definitely preferred than proximal fibula resection or arthrodesis to restore normal ankle biomechanics. Surgeons should be

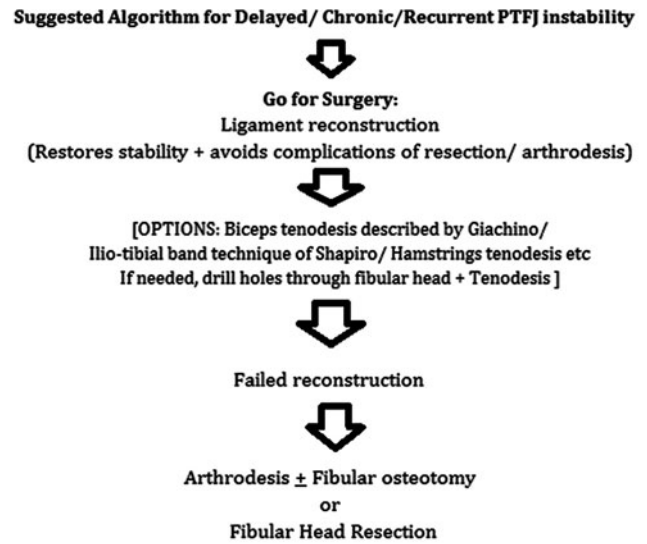


Figure 7: Treatment algorithm in recurrent instability

aware of popliteal artery rupture in inferior type dislocation and peroneal nerve palsy in superior and anterolateral dislocation. Tinel’s test should be performed by percussing over the common peroneal nerve. When peroneal nerve palsy is present, fibular head resection and neurolysis may be required.³⁴ The lateral collateral ligament and arcuate complex must be sutured back to tibia [Figure 4]. Resection, however, may cause chronic ankle pain and knee instability. Fibular resection is not recommended in children.

Delay diagnosis and reduction means need for more extensive surgery for salvage in all types of dislocations of PTFJ; even in isolated injury. Untreated proximal tibiofibular disruption is known to cause long term difficulties in terms of pain, gait disturbance, and inferior sports performance. Knowledge about this rather neglected joint will lead to better practice, less clinical error, and avoidance of more extensive surgeries due to diagnostic delays. In conclusion, knee dysfunction due to disorganization of PTFJ hardly finds attention by the clinicians and the anatomists, perhaps due to a prevailing notion that fibula carries no compressive load. PTFJ must be considered as the fourth compartment of the knee as over 10% PTFJ may have communication with the knee cavity.³⁴ After the review, we felt proposing a recommendation based on our review for the orthopedic academia that renaming PTFJ as the fourth compartment of the knee and PTFJ dislocations as Monteggia injury of the leg as recommended earlier by some authors.²⁷ and incorporating the need for early recognition of this injury in standard orthopedic textbook will bring the much required clinical awareness and less incidence of “missed” PTFJ dislocations.

REFERENCES

1. Barnett CH, Napier JR. The axis of rotation at the ankle joint in man; its influence upon the form of the talus and the mobility of the fibula. *J Anat* 1952;86:1-9.
2. Semonian RH, Denlinger PM, Duggan RJ. Proximal tibiofibular subluxation relationship to lateral knee pain: A review of proximal tibiofibular joint pathologies. *J Orthop Sports Phys Ther* 1995;21:248-57.
3. Lambert KL. The weight-bearing function of the fibula. A strain gauge study. *J Bone Joint Surg Am* 1971;53:507-13.
4. Johnson D. Pectoral girdle and upper limb. In: Standring Susan. *Gray's Anatomy*. 40th ed. Spain: Churchill Livingstone, Elsevier; 2008. p. 775-906.
5. Ogden JA. Subluxation and dislocation of the proximal tibiofibular joint. *J Bone Joint Surg Am* 1974;56:145-54.
6. Ogden JA. The anatomy and function of the proximal tibiofibular joint. *Clin Orthop Relat Res* 1974;101:186-91.
7. Eichenblat M, Nathan H. The proximal tibio fibular joint. An anatomical study with clinical and pathological considerations. *Int Orthop* 1983;7:31-9.
8. Moore KL, Dalley AF, Agur AM, Limb L. *Clinically Oriented Anatomy*. 6th ed. New Delhi: Lippincott and Williams and Wilkins, Wolters Kluwer India Pvt. Ltd.; 2010. p. 508-669.
9. Evans FG, Band S. *Studies on the Anatomy and Function of Bone and Joints*. New York: Springer-Verlag; 1966.
10. Bozkurt M, Yilmaz E, Atlihan D, Tekdemir I, Havitcioglu H, Günal I. The proximal tibiofibular joint: An anatomic study. *Clin Orthop Relat Res* 2003;406.1:136-40.
11. Andersen K. Dislocation of the superior tibiofibular joint. *Injury* 1985;16:494-8.
12. Giachino AA. Recurrent dislocations of the proximal tibio-fibular joint. Report of two cases. *J Bone Joint Surg Am* 1986;68:1104-6.
13. Gray H. *The Classic Collector's Edition – Gray's Anatomy*. New York: Bounty Books; 1977.
14. Gabrion A, Jarde O, Mertl P, de Lestang M. Inferior dislocation of the proximal tibiofibular joint: A report on four cases. *Acta Orthop Belg* 2003;69:522-7.
15. Veerappa LA, Gopalakrishna C. Traumatic proximal tibiofibular dislocation with neurovascular injury. *Indian J Orthop* 2012;46:585-8.
16. Keogh P, Masterson E, Murphy B, McCoy CT, Gibney RG, Kelly E. The role of radiography and computed tomography in the diagnosis of acute dislocation of the proximal tibiofibular joint. *Br J Radiol* 1993;66:108-11.
17. White SH. Bicipetal tenodesis for anterior subluxation of the superior tibiofibular joint. *J Bone Joint Surg Br* 2001;83:1176-7.
18. de la Caffinière JY, Meyer M. Superior fibulo-tibial traumatic luxation with fracture of the tibia. Apropos of 2 cases and a general review of the literature. *Rev Chir Orthop Reparatrice Appar Mot* 1988;74:366-9.
19. Dewijze M, Duriau F, Tondeur G. Traumatic superior peroneotibial luxation. *Acta Orthop Belg* 1979;45:559-66.
20. Levy M. Peroneal nerve palsy due to superior dislocation of the head of the fibula and shortening of the tibia (Monteggia-like fracture dislocation of the calf). *Acta Orthop Scand* 1975;46:1020-5.
21. Shelbourne KD, Pierce RO, Ritter MA. Superior dislocation of the fibular head associated with a tibia fracture. *Clin Orthop Relat Res* 1981;160:172-4.
22. Valenti P, Nordin JY. Posttraumatic dislocation of the upper tibiofibular joint. Review of the literature apropos of 6 cases. *Rev Chir Orthop Reparatrice Appar Mot* 1989;75:112-9.
23. Sekiya JK, Kuhn JE. Instability of the proximal tibiofibular joint. *J Am Acad Orthop Surg* 2003;11:120-8.
24. Ares O, Conesa X, Seijas R, Carrera L. Proximal tibiofibular dislocation associated with fracture of the tibia: A case report. *Cases J* 2009;2:196.
25. Brana Vigil A, Mieres Barredo P, Montes Mortera S. Traumatic luxation of the proximal tibiofibular joint, superior variety. A case report. *Acta Orthop Belg* 1983;49:479-82.
26. Burgos J, Alvarez-Montero R, Gonzalez-Herranz P, Rapariz JM. Traumatic proximal tibiofibular dislocation. *J Pediatr Orthop B* 1997;6:70-2.
27. Joshi RP, Heatley FW. Dislocation of superior tibio-fibular joint in association with fracture of the tibia: 'Monteggia' injury of the leg. *Injury* 1997;28:405-7.
28. Hobby B, Moore K, Tripuraneni K, Richter D, Schenk RC Jr. Knee dislocations, fracture dislocations, and traumatic ligament injuries of the knee. In: *Review of Orthopaedic Trauma*. 2nd ed., Ch. 8. Philadelphia: Lippincott Williams and Wilkins; 2013. p. 98-115.
29. Sarma A, Borgohain B, Saikia B. Proximal tibio-fibular joint: A rather forgotten joint. *North East Orthoscan* 2012;8:S1-9.
30. Schenck RC Jr, Stannard JP, Wascher DC. Dislocations and fracture-dislocations of the knee. In: *Rockwood and Green's Fractures in Adults*. 6th ed., Ch. 51. Philadelphia: Lippincott Williams and Wilkins; 2006. p. 2032-77.
31. Parkes JC 2nd, Zelko RR. Isolated acute dislocation of the proximal tibiofibular joint. Case report. *J Bone Joint Surg Am* 1973;55:177-83.
32. Mena H, Brautigan B, Johnson DL. Split biceps femoris tendon reconstruction for proximal tibiofibular joint instability. *Arthroscopy* 2001;17:668-71.
33. Cazeneuve JF, Bracq H. Chronic instability of the proximal tibio-fibular articulation: Hemi-long biceps ligamentoplasty by the Weinert and Giachino technique. Apropos of 3 cases. *Rev Chir Orthop Reparatrice Appar Mot* 1998;84:84-7.
34. Kopydlowski N, Tannenbaum E, Sekiya JK. Dislocation of the proximal tibiofibular joint. In: Scott WN, Scuderi G, editors. *Insall and Scott Surgery of the Knee*. 5th ed., Ch. 60. Philadelphia: Elsevier. Churchill and Livingstone; 2012.

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