



Case Report

A rare case of recurrent medial dislocation of the 1st metatarsophalangeal joint in a professional athlete

Rajiv Shah^a, Pascal DeNiese^{b,*}, Deepak Bhatia^c

^a Department of Foot and Ankle Orthopaedics Sunshine Global Hospitals, Vadodara and Surat, Gujarat, India

^b Consultant Foot and Ankle surgeon, Department of Orthopaedics, Holy Spirit Hospital, Mumbai, India

^c Consultant Orthopaedic Surgeon, Sportsmed Mumbai, India

ARTICLE INFO

Keywords:

Capsuloligamentous structures
Kabaddi
Palmaris longus graft
Recurrent dislocation

ABSTRACT

Dislocations of the first metatarsophalangeal joint are rare, and recurrent dislocations unique. A national-level Kabaddi player dislocated his right first metatarsophalangeal joint while playing a game barefooted. After self-manipulative reduction, the patient had multiple dislocations. The patient reported after a year of injury with complaints of recurrent medial dislocations of the first metatarsophalangeal joint. At surgery, reconstruction of deficient lateral capsule-ligamentous structures of the first metatarsophalangeal joint was done with Palmaris longus autograft. The patient returned to sports in six months and was followed up for more than two years. The case is unique in the form that recurrent medial dislocation of first metatarsophalangeal dislocation is not described.

Level of clinical evidence: Level V.

1. Introduction

The first metatarsophalangeal (MTP) joint plays a vital role in the gait cycle. Injuries of 1st MTP joint are common in sports. Dislocations of 1st MTP joints are rare and are usually caused due to hyper dorsiflexion injuries [1]. Treatment ranges from closed reduction to open surgery [2, 3]. Kabaddi is a contact sport played with barefoot. As Kabaddi requires kicking, pulling, and pushing of the leg of an opponent, injuries are quite common [4]. Literature has not explicitly mentioned dislocations of the 1st MTP joint following a game of Kabaddi. Here we present a case of a professional Kabaddi player who had a medial dislocation of his right 1st MTP joint before a year. He self-reduced the dislocation and continued playing to end up with recurrent medial dislocations of the 1st MTP joint. To the best of our knowledge, literature has not described such a case before.

2. Case report

A professional Kabaddi player dislocated his 1st MTP joint during a game a year prior. He self-reduced the joint but was unable to continue the game and treated himself with rest and local applications. After that, he had multiple dislocations while playing, which were all self-reduced.

One year post-index injury, he reported to our institute with chief complaints of repetitive medial dislocations leading to loss of his focus while playing. He hardly had pain, except during dislocations. He was forced to play with a tailor-made strapping. The apprehension of getting dislocated also affected his performance.

On clinical examination, he had deep tenderness on the plantar and medial aspect of the 1st MTP joint, without any limitation of movements. Joint had lateral laxity but could not be dislocated manually. He had a positive apprehension test on an attempt to dislocate the joint. The X-Rays showed Jahss Type 2A injury along with a fracture of the fibular sesamoid (Fig. 1). No signs of arthritis were seen. MRI showed a disruption of the intersesamoid ligament along with rupture of the lateral structures (Adductor hallucis-transverse and oblique heads, lateral head of flexor hallucis, and a fracture of the fibula sesamoid) (Fig. 2).

The patient underwent surgery in a supine position with a thigh tourniquet. The operative foot was elevated over two sterile pillows. Intense illumination from the foot end of the table helped in visualization. An inverted J shaped plantar incision (Fig. 3) was made on the non-weight bearing area between first and second rays. A full-thickness flap was lifted. The neurovascular bundle was protected, and torn structures visualized. On exploration, lateral capsuloligamentous structures were

* Corresponding author.

E-mail addresses: rajivortho@gmail.com (R. Shah), drdeniese@gmail.com (P. DeNiese), shoulderclinic@gmail.com (D. Bhatia).



Fig. 1. Anteroposterior, oblique, and sesamoid views of the right foot demonstrating fracture of fibular sesamoid with increased inter sesamoid distance.

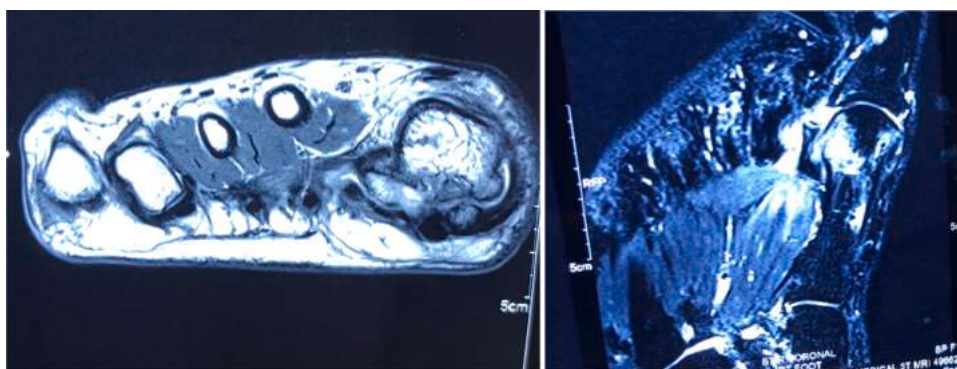


Fig. 2. MRI images of the same patient demonstrating extensive plantar and lateral soft tissue injury.

found to be torn and deficient. Fibular sesamoid was fractured together with proximal retraction of the ruptured tendon of flexor hallucis brevis.

Fractured fibular sesamoid was excised given comminution. The tendon of flexor hallucis brevis was sutured back as nearer as possible to its original attachment. Lateral capsuloligamentous structures were found to be non-repairable. A Palmaris longus graft was harvested 5 from the same sided wrist to reconstruct deficient lateral capsuloligamentous structures of the 1st MTP joint. Graft thickness was measured. A proximal tunnel of appropriate size was created at the head-neck junction of the first metatarsal. The idea was to be as nearer as possible to the original anatomical location of the ligaments of the 1st MTP joint. Tendon graft was passed from lateral to medial through the tunnel. The graft was anchored snugly with the medial soft tissues with non-absorbable sutures. The second tunnel was drilled distally in the base of the proximal phalanx from lateral to medial direction. The graft was threaded medially through this tunnel. The graft was precisely tensioned. With a joint positioned in a neutral position, the graft was anchored medially with non-absorbable sutures (Fig. 4). A separate medial incision was used for graft anchorage. After lavage, wounds were closed in layers. A protective strapping and a below-knee splint were applied for three weeks. At three weeks, after removal of the splint, a range of motion exercises was started. Full weight-bearing was advised

at six weeks. Return to sports was allowed after three months with a protective strapping for another three months. It is now more than two years that he has gone back to competitive sports without a single incidence of dislocation.

3. Discussion

The first MTP joint plays a vital role in the function of the foot, especially in the push-off phase of the gait cycle [1]. The complex anatomy surrounding this joint provides stability when a large number of forces pass through the joint during the gait cycle. The joint is stabilized by the articulating surfaces, strong fibrous collateral ligaments, the plantar plate complex, which includes the sesamoids, their ligaments, contributions from the flexor hallucis brevis, the abductor hallucis, the oblique and transverse heads of the adductor hallucis along with the transverse metatarsal ligament [2]. Dislocations of the first MTP joints are rare and are usually caused due to hyper dorsiflexion of the 1st MTP, the classification for which was described by Jahss [3]. Dislocation of the first MTP joint can affect an athlete's performance [1].

Kabaddi is a kind of contact sports, which necessitates a maneuver of pull and push of leg of an opponent. The game is to be played barefooted. Kabaddi is the most aggressive and massive contact game leading to



Fig. 3. Intra-operative picture of marking of an inverted J incision over the non-weight bearing area between the first and second rays.

multiple injuries [4,5]. Ankle and foot injuries result either due to collision with opponents or due to extensive pulling and pushing forces to lower body. A study specifically focused on injuries in professional male Kabaddi players observed that 32% of total injuries were in the lower limb, with the rate of joint injuries in lower extremity being 4% [5]. Literature has mentioned the rare occurrence of injuries of foot joints in Kabaddi players without a specific mention of medial dislocation of the first MTP joint.

Ruptured lateral capsuloligamentous structures of the first MTP joint will lead to a medial dislocation. Treatment comprises a closed reduction and immobilization for a few weeks [2,3]. Neglected or poorly managed cases will have recurrence because of deficient capsuloligamentous structures. In the case under study, scientific treatment was not followed. The patient also continued playing contact sports without any protection, leading to recurrent medial dislocation of the 1st MTP joint. To the best of our knowledge, literature has not reported a case of recurrent dislocation of the 1st MTP joint.

Injury pattern in a case under study was similar to a Jahss Type 2A with radiographs showing a diastasis of the sesamoids. The damage was

substantial due to the repetitive nature of the injury and the gap of a hospital visit. As there were no signs of arthritis, the surgical plan to reconstruct the lateral collateral ligament along with the repair of plantar-lateral structures was undertaken [6]. Moreover, Given a patient being a professional kabaddi player, preservation of movements of his 1st MTP joint was vital [3,5]. The plantar approach through a non-weight bearing area helps in later date painless ambulation [7]. Comminution of fibular sesamoid warranted its excision with reattachment of the tendon of flexor hallucis brevis [7]. The purpose of utilizing the Palmaris longus autograft served as a robust anatomical replacement for the lateral collateral ligament for a high demand professional athlete [8] Such a reconstruction on the lateral side prevents recurrent medial dislocations along with maintaining the biomechanics through the 1st MTP joint. We did not use a Plantaris autograft as we had a question about its strength [9]. Given the non-availability of advanced gadgets, a pull-out suture technique with bone tunnels was used to anchor the graft. Our eyes were also on the reduction of the cost.

Postoperatively, the time required for the soft tissues to heal without loading the repair is about six weeks. Rehabilitation focuses on the range

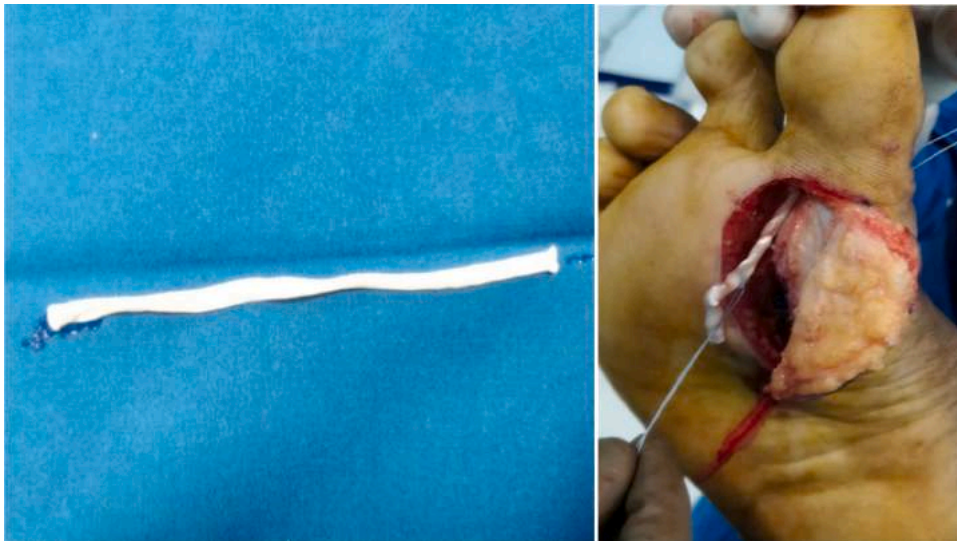


Fig. 4. Harvested Palmaris longus autograft is positioned over the lateral aspect of the first metatarsophalangeal joint for the reconstruction of deficient lateral capsuloligamentous structures.

of movements. The aim is to achieve a push-off strength comparable with the opposite foot [10]. Failure to stabilize the joint would ultimately result in severe arthritis and a premature end to the career of a Kabaddi player. It is concluded that the use of Palmaris longus autograft with the repair of plantar structures is anatomically and financially sound solution in cases of recurrent medial dislocations of the 1st MTP joint.

References

- [1] Frimenko RE, Lievers W, Coughlin MJ, Anderson RB, Crandall JR, Kent RW. Etiology and biomechanics of first metatarsophalangeal joint sprains (turf toe) in athletes. *Crit Rev Biomed Eng* 2012;40(1):43–61. Review. PubMed PMID: 22428798.
- [2] McCormick JJ, Anderson RB. Turf toe: anatomy, diagnosis, and treatment. *Sports Health* 2010;2(November (6)):487–94. PubMed PMID: 23015979; PubMed Central PMCID:PMC3438874.
- [3] Jahss MH. Traumatic dislocations of the first metatarsophalangeal joint. *Foot Ankle* 1980;1(July (1)):15–21. PubMed PMID: 7274888.
- [4] Prabhu Ananthapadmanabha, Kishore Kumar CK. Common injuries among Kabaddi and kho-kho players — an empirical study. *Int J Eng Res Sports Sci* 2014;1 (June (7)):1–4.
- [5] MoeiniShabestari M, Hojat SH, Agahaei R. The epidemiology of some common injuries in elite male kabaddi player. *Sports Sci Q* 2011;2(Winter (6)):11–30.
- [6] Roddy E, Menz HB. Foot osteoarthritis: latest evidence and developments. *Ther Adv Musculoskelet Dis* 2018;10(April (4)):91–103. <https://doi.org/10.1177/1759720X17753337>. Epub2018 Jan 23. Review. PubMed PMID: 29619094; PubMed Central PMCID: PMC5871064.
- [7] Milia MJ, Cohen BE, Anderson RB. Plantar approach for isolated fibular hallux sesamoidectomy. *Tech Foot Ankle Surg* 2003;2(4):268–71. <https://doi.org/10.1097/00132587-200312000-00008>.
- [8] Saeed WR, Kay SP. Harvest of palmaris longus tendon: technique. *J Hand Surg Br* 1993;18(October (5)):583–4. PubMed PMID: 8294818.
- [9] Santos Marcos Antonio Dos, Bertelli Jayme Augusto, Kechele Paulo Roberto, Duarte Hamilton. Anatomical study of the plantaris tendon: reliability as a tendosseous graft. *Surg Radiol Anat* 2009;31:59–61.
- [10] McCormick JJ, Anderson RB. Rehabilitation following turf toe injury and plantar plate repair. *Clin Sports Med* 2010;29(April (2)). <https://doi.org/10.1016/j.csm.2009.12.010>. 313–323, ix Review. PubMed PMID: 20226323.