



# Results of suture button fixation with targeting device aid for displaced ligamentous Lisfranc injuries in the elite athlete



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## HIGHLIGHTS

- A common injury in the elite athlete.
- New fixation method.
- Lisfranc injury has significant financial implications.

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## 1. Introduction

Lisfranc injuries occur in the midfoot area, which is subjected to significant stress in a running athlete. There has been a rise in Lisfranc injuries in soccer and rugby players during the last decade. The cause is multifactorial; faster and stronger players, higher energy injuries, lighter weight and more flexible shoes and even artificial playing surfaces could be contributing to the rise. The mechanism is thought to occur with the foot in plantarflexed position and another player lands on the heel causing a pivoting moment [1,2].

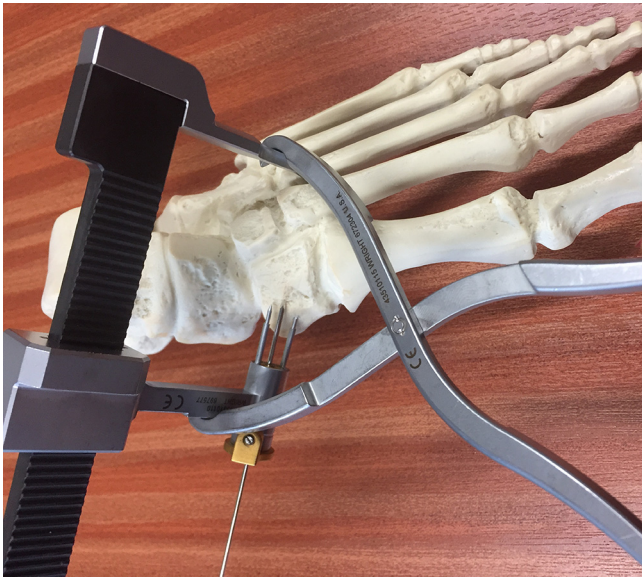
The Lisfranc ligament runs obliquely from the plantar base of the second metatarsal to the medial cuneiform acting as a stabilizer of the medial column of the forefoot [3]. Injury to the tarsometatarsal joint complex (ligamentous or fracture-dislocation), with displacement of more than 2 mm is an indication for operative treatment [2]. The traditional technique consists of open reduction and screw fixation aiming for a strong construct [4]. Screw

breakage and metalwork prominence are not uncommon and thus screws are usually removed in the elite athlete before return to full competition, delaying further rehabilitation [5]. A suture button technique (TightRope™, Arthrex, Inc, Naples, FL, USA) offers advantages including a more physiologic, less rigid mode of fixation and the unlikely need for re-operation to remove metalwork. The use of the Targeting guide and the correspondent guide wire from the CHARLOTTE® Lisfranc Reconstruction System (Targeting Device and Guide Wire, Wright Medical Group, Inc, Memphis, USA) offers the advantage of accurate positioning of the suture button avoiding multiple drilling, cartilage damage, fracture or breakage of the guide wire. We aim to report our experience with tightrope fixation in these elite level, professional soccer and rugby players, with displaced ligamentous Lisfranc injuries, outlining its advantages against current established techniques.

## 2. Operative technique and methods

Under general anaesthesia with a tourniquet, a dorsal incision over the Lisfranc zone was made, debris removed and the area anatomically reduced. The Targeting Device (CHARLOTTE®

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**Fig. 1.** CHARLOTTE® Lisfranc Reconstruction system with the ratcheting targeting guide in situ, across the reduced Lisfranc zone. Additional hold with the reduction clamp, and the K wire about to be drilled.



**Fig. 2.** CHARLOTTE® Lisfranc Reconstruction system, showing radiolucent targeting device, K wire and cannulated drill.

Lisfranc Reconstruction System) was applied, holding the reduction and allowing accurate placement of a guide wire, which was then over drilled under fluoroscopic control (Figs. 1 and 2). The TightRope™ was pulled through the drill hole engaging the lateral wall of the second metatarsal base and the medial wall of the medial cuneiform. Intra-operative dynamic assessment was performed using fluoroscopic control to determine midfoot stability. In cases of additional instability through the intercuneiform joints, a second Tightrope was placed across medial to intermediate cuneiform, stabilizing them (Figs. 3 and 4).

Post operatively a back slab was applied and the patient mobilized on crutches non weight bearing for 2 weeks. Following wound review at 2 weeks, the foot was placed into a below knee removable boot. Physiotherapy was commenced, with active and passive range of movement exercises and light Thera band activities, but the patient was continued non weight bearing for a further 4 weeks. Chemical thromboprophylaxis was maintained for 6 weeks. At 6 weeks, radiographs are taken to confirm a reduced Lisfranc joint.



**Fig. 3.** Radiograph showing Lisfranc injury.



**Fig. 4.** Post op.

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