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## **Synthetic neoligamentoplasty with FiberTape has the same rigidity as transarticular screws in Lisfranc subtle lesions**

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### **ABSTRACT**

**Introduction:** Lisfranc joint injuries occur due to direct or indirect trauma. Recently, new treatment options are being sought to use methods that allow more physiologic fixation of this joint. The purpose of this study was to analyze the stability of a cadaveric Lisfranc injury model fixed with a synthetic neoligamentoplasty in comparison to traditional trans-articular screw fixation.

**Methods:** Twenty-four fresh-frozen lower leg cadaveric specimens were utilized. The medial (C1) and intermediate (C2) cuneiforms and the first (M1) and second (M2) metatarsal bones were marked. A complete ligament injury was performed between C1-C2 and C1-M2 in 12 specimens (Group 1) and between C1-C2, C1-M2, C1-M1 and C2-M2 in 12 matched specimens (Group 2). The groups were further divided by fixation with screws (G1 Screws and G2 Screws) and with Tape (G1 Tape and G2 Tape). The tape fixation group underwent the fixation technique using FiberTape (Arthrex, Inc.). After ligament lesion and fixation, the construct rigidity was measured with the help of a 3D Digitizer arm during a stress condition (pronation and supination of the forefoot).

**Results:** The C1-C2 distance increased 3mm after ligament injury (23% increase) with supination motion. C1-M2 increased 4mm after ligament injury (21% increase) with pronation motion. Distances between C1-M1 and C2-M2 only changed in Group 2, increasing 3mm (14%) and 2mm (16%), respectively. Rigidity between C1-C2, C1- M1 and C2-M2 did not differ between the fixation with screws and tape. The fixation with screws presented more rigidity in the C1-M2 distance ( $p=0,03$ ), but only during pronation stress.

**Conclusion:** Tape and Screws can produce the same rigidity after repair of Lisfranc Ligament injuries, excluding the C1-M2 distance during pronation stress.

**Keywords:** Lisfranc joint; Internal fixation; Neoligamentoplasty.

