



## Case Report

# Complete medial column dislocation at the cuneonavicular joint: An unusual Lisfranc-like injury



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## ABSTRACT

Lisfranc injuries represent a wide spectrum of different injuries at the tarsometatarsal joint. Not all types fit the currently available classifications. This case illustrates a rare subtype of a Lisfranc injury, with a dislocation of the entire first ray. It is presented to create more awareness for midfoot injuries. This article reviews the literature and provides recommendations for the treatment of similar cases in the future.

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## 1. Introduction

Lisfranc injuries are rare and frequently overlooked. Urgent identification and treatment are of paramount importance for a more favorable outcome [1].

The classification systems most frequently used are derived from the Quenu-Kuss classification, which was modified by Hardcastle and further developed by Myerson [2]. A large proportion of tarsometatarsal injuries fits this classification. There are however some injuries that do not adhere to these classifications, and are even more rare than the usual type of Lisfranc injuries. The forefoot is frequently divided into three columns (medial, central, lateral), in this case report we report on a type of midfoot injury involving only the medial column.

## 2. Case

A 44-year-old female patient was presented at the emergency department (ED) after a fall from the stairs. Because of a low Glasgow Coma Scale of 8 she was intubated at the ED. A trauma-screening according to the ATLS® revealed no apparent injuries. A

third trauma survey at the ward revealed a swollen right foot with a bony prominence at the medial side of the foot.

A conventional radiograph showed a medial translation of the entire first column with a dislocation at the cuneonavicular joint (Fig. 1a and b). An additional CT-scan showed the dislocation in more detail and a comminuted impaction-fracture of the medial distal part of the navicular tuberosity (Fig. 1c).

When her condition had improved and the swelling settled, she was operated upon on day 12 (Fig. 2). A medial incision was made over the navicular bone towards the middle of the first metatarsal. A variable angle forefoot plate was cut to size and fitted as bridging plate to the inferomedial side of the medial column. After reduction of the first ray with a large pointed forceps the plate was fixated to anatomically secure the medial column to the middle column. The fracture of the navicular bone was reduced and fixated underneath the plate. A non-weight-bearing lower leg cast was applied for six weeks followed by a weight-bearing cast for another six weeks.

At follow-up the patient reported pain during ambulation, a conventional radiograph did not show loosening therefore the pain was attributed to the implant and removal was scheduled. Pre-operatively a CT scan was made to assess the healing of the navicular impression fracture. The CT scan showed that the fragment had resorbed and a recurrent diastasis was visible between the medial and middle column (Fig. 3). This finding was confirmed at surgery at which point a formal arthrodesis was performed between medial and intermediate cuneiform with the navicular bone (Fig. 4). An additional compression screw was used from the first to the second metatarsal to reduce the recurrent diastasis and

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**Fig. 1.** Initial trauma radiographs and CT-scan of injury showing dislocation of first ray and shear fracture of the navicular tuberosity.

provide increased stability. Postoperatively the patient suffered from a wound dehiscence, which resolved with conservative measures. She is currently walking pain free in high heels at 1-year follow-up.

### 3. Discussion

A cuneonavicular fracture–dislocation of the entire medial column is a rare injury.

We were able to identify six studies with seven similar cases over a period of almost thirty years [3–7]. The combined cases from the literature and ours show that the average age was 36 years (range 21–67), there were 4 female patients and 4 male. The trauma-mechanism was predominantly low energy trauma (Table 1). The current case differed in the initial treatment using temporary bridge-plating to prevent further harm to the joint surfaces [8,9].

In most cases in the literature a compression fracture of the medial distal navicular bone was visible, however not always described. This fracture originates from the shear forces of the

medial cuneiform when moving outwards and proximally. We tried to preserve this fragment but this was unsuccessful, resulting in an unstable first cuneonavicular joint due to the lack of support of the medial cuneiform. Without this fragment the medial cuneiform is no longer supported by the navicular bone increasing instability even with a well reduced intercuneiform joint.

It is unclear why the bridge fixation in our case failed. There was little doubt concerning the reduction as visible on the per- and post-operative images and concerning patients' adherence to the weight-bearing protocol. A tissue culture during the secondary procedure did not reveal a low-grade infection. It is possible that the more extensive dissection caused avascular necrosis of the bony fragment from the navicular bone.

The seven previously reported cases showed overall good outcome, with no apparent difference between treatment modalities. Most of the previously published studies deal with young patients and support open reduction and internal fixation, which formed the basis of our initial treatment plan. Our case differs not only from the used technique but also from the delay between injury and definitive surgery.

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