

## Case Report

# Medial naviculocuneiform fracture-dislocations: A report of two cases

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## Abstract

Medial naviculocuneiform fracture-dislocation – classified as a type B1 Lisfranc injury according to the Hardcastle classification modified by Myerson, or perhaps more accurately termed a 'Lisfranc-like medial column injury extending to the naviculocuneiform joint' – is an uncommon pathology. Available evidence is limited, with only a few cases reported in the literature. We present two cases of medial naviculocuneiform fracture-dislocation treated with different surgical techniques. The first case presented acutely and was managed with rigid fixation using cannulated screws. In contrast, the second case underwent primary arthrodesis due to a prolonged time since the injury and articular damage. Both patients were followed clinically and radiographically for 12 months. At the final follow-up, the acute case demonstrated an American Orthopaedic Foot and Ankle Society (AOFAS) midfoot score of 70/100 and a visual analog scale (VAS) score of 4/10, but with early osteoarthritic changes. In contrast, the delayed presentation case achieved an AOFAS midfoot score of 85/100 and a VAS score of 2/10.

**Level of Evidence IV; Case Report.**

**Keywords:** Fracture fixation, internal; Arthrodesis; Treatment outcome.

## Introduction

Lisfranc injuries are infrequent, and according to the series by Stødle et al.<sup>(1)</sup>, the incidence is 14/100,000 person-years, with only 31% resulting from high-energy trauma. The Hardcastle classification, modified by Myerson, categorizes injuries based on joint congruity, direction of displacement, and extent of involvement<sup>(2)</sup>. Type B1 injuries result in a partial incongruity of the tarsometatarsal joint, affecting only the first metatarsal and the medial cuneiform. However, some cases may also compromise the intercuneiform and naviculocuneiform joints, presenting with isolated medial dislocation. Characteristically, the remaining metatarsals maintain congruency with the rest of the midfoot<sup>(3)</sup>.

Cases with isolated involvement of this medial column of the foot have been rarely described. This report describes two cases of medial naviculocuneiform fracture-

dislocation, including their initial diagnosis, management, and 12-month follow-up. Importantly, the novelty of this study is that the same unusual injury pattern was treated with two distinct surgical strategies. The choice of fixation in Case 1 was influenced by the acute presentation, whereas primary arthrodesis was selected in Case 2 due to delayed presentation and concomitant articular degeneration at the naviculocuneiform joint.

## Case presentation

### Case 1

A 38-year-old female patient with no relevant prior medical history was brought to the emergency department after a motorcycle accident in which she collided with another vehicle, sustaining trauma to her right foot. Physical examination revealed moderate edema, pain, and ecchymosis

Study performed at Hospital Alma Máter de Antioquia, Medellín, Colombia.

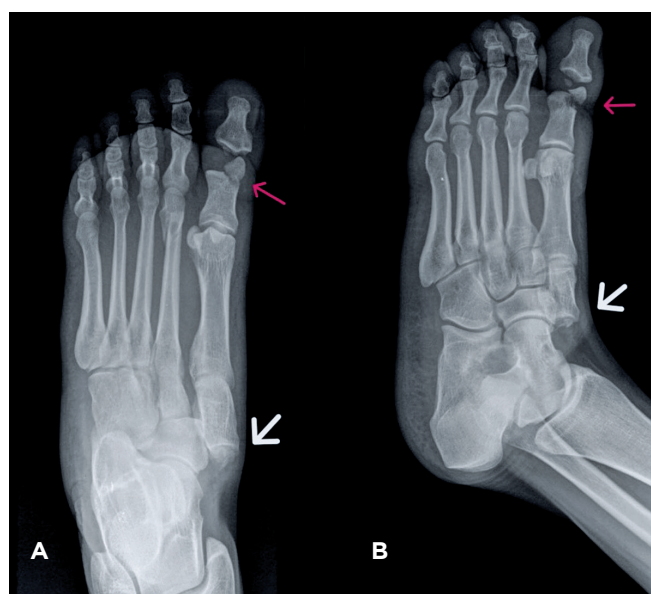
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on the dorsum of the midfoot, along with a palpable bone deformity. Ecchymosis was also present on the ipsilateral hallux. Initial plain radiographs of the foot showed a proximal and medial dislocation of the first ray at the naviculocuneiform joint. The fracture-dislocation of the ipsilateral hallux at the interphalangeal joint with condylar fracture of the proximal phalanx was also evident (Figure 1). Advanced imaging, such as a computed tomography (CT) scan, was omitted as the patient required emergent surgical intervention. To prevent neurovascular compromise and soft-tissue complications, the patient was taken directly to the operating room for immediate closed reduction. Postoperative radiographs confirmed the correction of the deformities as a damage control measure (Figure 2).

Two weeks later, after the edema had resolved, the medial column was fixed in the operating room using 3.5mm cannulated screws that crossed the intercuneiform and naviculocuneiform joints, serving as a temporary fixation method while preserving the articular cartilage. A miniopen surgical approach was employed directly to the intercuneiform and naviculocuneiform joints. Reduction was achieved with a Weber clamp under direct visualization and fluoroscopic control to verify a congruent reduction. The previously performed percutaneous fixation of the hallux was removed. The patient was discharged home with a bulky bandage and instructed to avoid weight-bearing. At the two-week postoperative visit, the sutures were removed, the follow-up radiograph showed adequate reduction and fixation, and the hallux fracture-dislocation remained stable (Figure 3).



**Figure 1.** Anteroposterior (A) and oblique (B) radiographs of the right foot, demonstrating the naviculocuneiform fracture-dislocation with medial and proximal displacement (white arrow). Interphalangeal fracture-dislocation of the hallux with condylar fracture of the proximal phalanx (red arrow).



**Figure 2.** Anteroposterior (A), lateral (B), and oblique (C) radiographs show adequate reduction with K-wires of the naviculocuneiform and hallux fracture-dislocation, as a damage control measure.



**Figure 3.** Fixation was performed using 3.5mm cannulated screws, as shown in the oblique (A) and anteroposterior (B) radiographs, with screw trajectories extending from the navicular to the first cuneiform, across the intercuneiform region, and from the medial cuneiform to the navicular. There is progressive consolidation of the hallux condylar fracture, without evidence of loss of reduction. The naviculocuneiform alignment remains satisfactory on the lateral projection (C).

The patient initiated a structured physical therapy program incorporating progressive, protected nonweightbearing restrictions. She gradually transitioned through partial weightbearing stages as the soft tissues demonstrated clinical improvement and radiographic evaluations confirmed fixation stability, ultimately achieving full weight-bearing without external support at 16 weeks postoperatively. At 24 weeks, she was briskly walking and working as a gardener with footwear incorporating a medial scaphoid lift. At 10 months, routine removal was planned because the screws crossed mobile joints. After 12 months, the patient achieved a score of 70/100 on the American Orthopaedic Foot and Ankle Society (AOFAS Midfoot Score) scale, and a score of 4/10 on the Visual Analog Scale (VAS). For the hallux, the score on the AOFAS hallux metatarsophalangeal-interphalangeal score was 82/100. Radiographs obtained at 12 months postoperatively demonstrated early signs of midfoot osteoarthritis, along with subtle collapse of the medial longitudinal arch (Figure 4).

## Case 2

A 50-year-old female patient presented to the emergency department 24 days after sustaining an inversion injury to the right ankle following a fall down the stairs. The patient presented with persistent pain, midfoot deformity, and limping. Upon admission, initial plain radiographs of the foot and ankle revealed a naviculocuneiform joint dislocation

associated with a fracture at the base of the first cuneiform (Figure 5). Given the delayed presentation and the presence of a fracture-dislocation, open reduction and primary arthrodesis was selected as the surgical treatment; a CT scan was not performed due to these clinical findings. The patient was taken to the operating room under general anesthesia, and using an anteromedial approach between the anterior and posterior tibialis tendons, the articular cartilage of the first and second cuneiforms as well as the navicular facet were evaluated, revealing erosion, fragmentation, and impaction. Articular scarification of the intercuneiform and naviculocuneiform joints was performed, followed by subchondral bone drilling. An autologous bone graft harvested from the calcaneus was applied to enhance fusion, and reduction of the cuneiform dislocation was achieved under direct visualization. Fixation was achieved with a 3.5 mm partially threaded cannulated screw between the navicular and first cuneiform by using the lag technique, and a bridge plate between the navicular and first metatarsal, to supplement compression at the arthrodesis site. The wound was closed in layers, and a bulky dressing was applied. The patient was discharged with analgesia and non-weight-bearing.

Two weeks after surgery, the wounds were evaluated, and sutures were removed. A follow-up radiograph showed adequate reduction and fixation (Figure 6). The patient initiated a physical therapy program to improve mobility, and progressive, protected weight-bearing in a CAM walker



**Figure 4.** Weight-bearing radiographs at 12-month follow-up. Comparative anteroposterior radiograph (A) with adequate alignment, slight changes of intercuneiform osteoarthritis in the right foot. Right lateral radiograph (B) with minimal decrease of the calcaneal pitch (26°), with respect to the left lateral radiograph (C), with normal angle (30°).

boot was permitted at week 12, only after the soft tissues demonstrated improvement of edema, there was no pain at the arthrodesis site, and radiographic evaluations confirmed construct stability. At nine months postoperatively, hardware

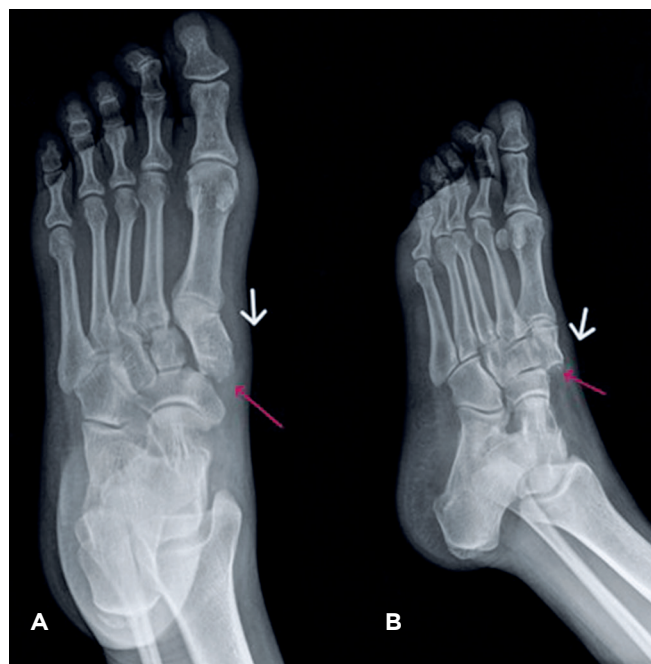
removal was performed due to symptoms from prominence beneath the skin and evidence of breakage observed during radiographic follow-up (Figure 7).

After 12 months from her index surgery, the patient achieved an AOFAS midfoot score of 85/100 and VAS of 2/10. She resumed her household duties, and the patient did not require the use of orthopedic shoes.

## Discussion

According to the Hardcastle classification, as modified by Myerson, type B1 injuries correspond to partial incongruity of the medial column, specifically involving the first metatarsal and the medial cuneiform. The inter and intraobserver reliability of this system has been validated in several studies, making it useful in clinical practice<sup>(4)</sup>. These type B1 injuries with naviculocuneiform extension therefore represent Lisfranc-like medial column injuries, rather than typical tarso-metatarsal Lisfranc injuries (Figure 8).

They are uncommon; the literature reports very few cases over several decades, limiting the available evidence (Table 1)<sup>(5-10)</sup>. Regarding reduction and fixation methods, both closed and open reduction with K-wires have demonstrated good medium term clinical outcomes in acute cases without associated fracture, although mild arthritic changes have been reported<sup>(5,8,9)</sup>. Rigid internal fixation with 3.5mm cannulated screws has shown superior stability compared to K-wires, with favorable clinical results<sup>(7)</sup>. Bridge plating can maintain reduction; however, complications such as loosening and the need for revision have been described<sup>(9)</sup>. Primary arthrodesis, in cases with evident cuneiform and/or navicular joint injury, has yielded satisfactory outcomes after 18 months of follow-up<sup>(6)</sup>. In situations of nonunion of cuneiform fractures or



**Figure 5.** Anteroposterior (A) and oblique (B) radiographs of the right foot showing proximal and medial naviculocuneiform dislocation (white arrow). Fracture at the base of the first cuneiform (red arrow).

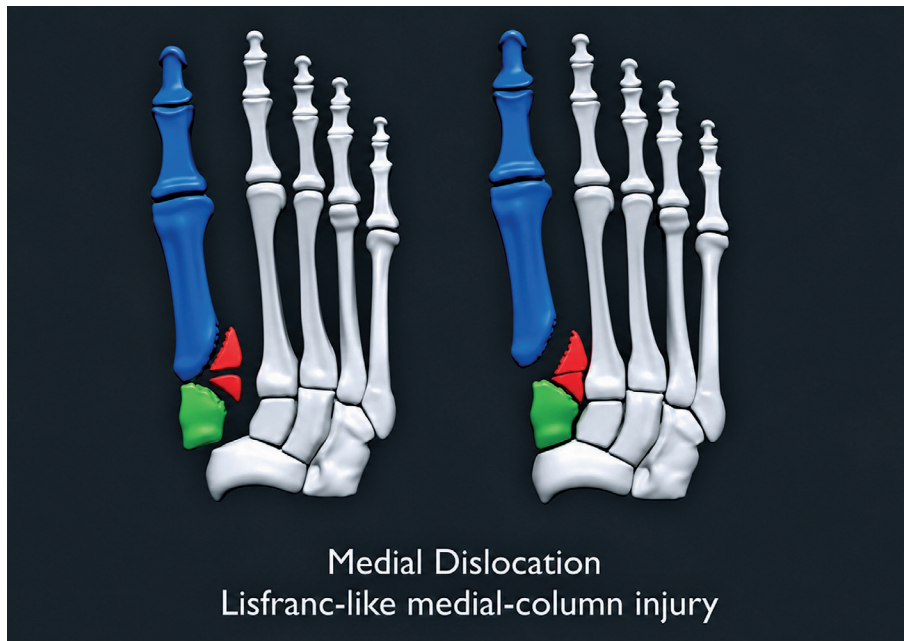


**Figure 6.** Oblique (A), anteroposterior (B), and lateral (C) radiographs with adequate reduction in all planes using a 3.5 mm screw and a bridge plate between the navicular and first metatarsal, for naviculocuneiform arthrodesis.





**Figure 7.** Radiographic control at nine months after material removal. (A) Comparative anteroposterior radiograph with adequate alignment of the midfoot and forefoot. (B) Oblique radiograph of the right foot shows complete consolidation of the intercuneiform and naviculocuneiform arthrodesis. (C and D) Comparative lateral weight-bearing radiographs of the feet, without longitudinal arch collapse, and with a remnant of broken intraosseous screws in the right foot.



**Figure 8.** Type B1 injuries (partial incongruity of the medial column, specifically involving the first metatarsal and the medial cuneiform; these represent Lisfranc-like medial column injuries with naviculocuneiform extension), in the Hardcastle classification modified by Myerson. (Schematic educational illustration 3D modeling, created specifically for this manuscript. Courtesy and permission for use confirmed by Juan Fernando Romero Rosero).

**Table 1.** Review of cases reported in the literature

| Reporting of previous cases         | Number of patients | Age                        | Mechanism of trauma                                                            | Type of injury                                                                                                                                                                               | Open/closed reduction                                                                                                                                                                               | Tracking                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | AOFAS midfoot score / VAS scale |
|-------------------------------------|--------------------|----------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Dines et al. <sup>(6)</sup>         | 1                  | 37-year-old                | Foot slammed onto brake pedal of car                                           | Isolated dorsomedial dislocation of the medial cuneiform and first ray at the medial naviculocuneiform joint                                                                                 | Closed reduction and 2 crossed K-wires percutaneous                                                                                                                                                 | Plaster short leg<br>Cast and K-wires for six weeks.<br>After five months. The patient was able to resume all her normal activities without pain or discomfort, except for some mild swelling after activity                                                                                                                                                                                                                                                                | No data                         |
| Grambart et al. <sup>(6)</sup>      | 2                  | 30-year-old<br>67-year-old | Foot into a fence while playing softball<br>Foot after tripping on a pothole   | Proximal-medial dislocation of the first ray at the medial cuneiform-navicular joint<br>Dislocation of the naviculocuneiform joint and fracture on the distal medial aspect of the navicular | Arthrodesis: Three 3.5-mm cortical lag screws<br>Arthrodesis: 4.0-mm cancellous screws placed with lag technique                                                                                    | At the 2-w: short-leg non-weight-bearing cast<br>At the 6-w: weight-bearing as tolerated<br>At the 18-month had returned to his pre-injury activities, without any discomfort.<br>Non-weight-bearing for a total of 8 w:<br>At the 15-month, the patient reported no limitations and had a well-aligned foot                                                                                                                                                                | No data<br>No data              |
| Thompson and Cameron <sup>(7)</sup> | 1                  | 21-year-old                | Trauma by American football                                                    | Dislocation of the first ray at the medial naviculocuneiform joint                                                                                                                           | Open reduction and screw fixation                                                                                                                                                                   | No data                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | No data                         |
| Aitken and Shortt <sup>(8)</sup>    | 1                  | 39-year-old                | She had tripped over a domestic pet, causing her to stumble down 3 or 4 stairs | Dorsomedial dislocation of the first ray at the medial naviculocuneiform and medial intercuneiform joints                                                                                    | A single 2-mm. K-wire across the medial naviculocuneiform joint under fluoroscopic guidance                                                                                                         | It was removed for 5 weeks.<br>Progress to full weightbearing<br>At 12 months: pain in the foot.<br>Magnetic resonance: Nonunion of a previously unnoticed medial cuneiform fracture:<br>Debridement, followed by autologous bone grafting and fixation with 4-mm cannulated screws. At final follow-up, 12 months following the bone grafting and internal fixation, the fusion was complete, the patient had minimal discomfort, and experienced no functional limitation | No data                         |
| Yu et al. <sup>(9)</sup>            | 1                  | 22-year-old                | Caused by a stumble when running with the right foot in plantar flexion        | Medial dislocation of the first ray at the medial naviculocuneiform and medial intercuneiform joints                                                                                         | Open reduction, internal fixation with K-wires                                                                                                                                                      | Four years after injury, the patient showed no discomfort, functional limitation, or degenerative osteoarthritis of the midfoot                                                                                                                                                                                                                                                                                                                                             | No data                         |
| Schepers et al. <sup>(10)</sup>     | 1                  | 44-year-old                | Fall from the stairs                                                           | Medial translation of the entire first column with a dislocation of the naviculocuneiform joint and a fracture of the medial distal part of the navicular tuberosity                         | Open reduction, internal fixation with plate. Non-weight-bearing for six weeks followed by a weight-bearing cast for another six weeks.<br>Removal was scheduled: recurrent diastasis: Arthrodesis. | At 1-year follow-up She is currently walking pain-free in high heels.                                                                                                                                                                                                                                                                                                                                                                                                       | No data                         |

W: Weeks; K-wires: Kirschner wire; AOFAS midfoot score: The American Orthopaedic Foot and Ankle Society Midfoot score; VAS: Visual Analog Scale

fixation failure, secondary arthrodesis has been employed as a management option, with variable results<sup>(8,9)</sup>.

In our study, we had the opportunity to evaluate, manage, and follow two cases with the same injury affecting the medial column of the foot, but treated with different fixation methods. The choice of management was influenced by the time elapsed until initial evaluation as well as the degree of articular degeneration at the naviculocuneiform joint. In Case 1, the subtle collapse of the medial arch and early degenerative changes observed at follow-up may represent important considerations when deciding between fixation and arthrodesis in similar injuries. In contrast, Case 2 was managed with primary arthrodesis, which resulted in an adequate clinical course without complications.

Preoperative imaging studies, such as CT scans, should be performed to more clearly define key aspects of the injury, including the degree of displacement, fracture pattern, articular deterioration, and the presence of occult lesions. This information allows for more accurate preoperative planning and facilitates the selection of the most appropriate fixation method.

In this context, primary arthrodesis may be considered a potentially preferred option in patients with significant joint involvement, whereas rigid internal fixation could be reserved for cases with preserved joint structures. However, this conclusion should be interpreted with caution, as it is based on only two reported cases and limited literature. Therefore, it should be regarded as a hypothesis generating suggestion rather than a definitive treatment algorithm.

The main limitation of our study is that it includes only two cases, each managed with different surgical methods according to their specific characteristics, which influenced the choice of treatment. In addition, advanced imaging such as a CT scan was not performed preoperatively, and the follow-up period was limited to 12 months.

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**Authors' contributions:** Each author contributed individually and significantly to the development of this article. JMRA \* (<https://orcid.org/0000-0002-9390-9496>) Performed the surgeries, data collection, survey of the medical records, and performed the clinical examination and performed the bibliographic review; RMR \* (<https://orcid.org/0009-0008-7214-8262>). Conceived and planned the activities that led to the study, interpreted the results of the study, participated in the review process, performed the surgeries, data collection, performed the bibliographic review, formatting of the article, survey of the medical records, and performed the clinical examination. All authors read and approved the final manuscript. \*ORCID (Open Researcher and Contributor ID) .

## References

1. Stødle AH, Hvaal KH, Enger M, Brøgger H, Madsen JE, Ellingsen Husebye E. Lisfranc injuries: incidence, mechanisms of injury and predictors of instability. *Foot Ankle Surg.* 2020;26(5):53540.
2. Hammad A, Ahmad Y, Abdelnour J. Lisfranc injuries: latest updates on diagnostics and management. *Transl Sports Med.* 2026;2026:3933956.
3. Freppon FN, Lammers OP, Kaul MG, Adam G, Henes FOG. Imaging diagnostics of Lisfranc joint injuries. *Rofo.* 2026;198(2):15363. German.
4. Mahmoud S, Hamad F, Riaz M, Ahmed G, Al Ateeq M, Ibrahim T. Reliability of the Lisfranc injury radiological classification (Myersonmodified Hardcastle classification system). *Int Orthop.* 2015;39(11):22158.
5. Dines DM, Hershon SJ, Smith N, Shelton P. Isolated dorsomedial dislocation of the first ray at the medial cuneonavicular joint of the foot: a rare injury to the tarsus. A case report. *Clin Orthop Relat Res.* 1984;(186):1624.
6. Grambart S, Patel S, Schubert JM. Naviculocuneiform dislocations treated with immediate arthrodesis: a report of 2 cases. *J Foot Ankle Surg.* 2005;44(3):22835.
7. Thompson TL, Cameron J. Dislocation of the first ray at the medial cuneonavicular joint in a football player. *Orthopedics.* 2006;29(6):5478.
8. Aitken SA, Shortt N. Dorsomedial fracture dislocation of the first ray and medial cuneiform: a case report. *J Foot Ankle Surg.* 2012;51(6):7957.
9. Yu C, Chen C, Chiu H. Isolated medial ray dislocation at the naviculocuneiform joint with intraarticular navicular and secondary metatarsal head fractures. *Formos J Musculoskelet Disord.* 2013;4:5668.
10. Schepers T, de Jong VM, Luitse JS. Complete medial column dislocation at the cuneonavicular joint: an unusual Lisfranc-like injury. *Foot (Edinb).* 2014;24(3):1359.