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Fracture-dislocations of the Lisfranc tarsometatarsal joint: Epidemiological, diagnostic, therapeutic and evolutionary study at the Dalal Jamm national hospital centre involving 07 cases

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Abstract
Introduction: The term 'Lisfranc lesion' broadly refers to a set of poorly defined lesions mainly affecting the tarsometatarsal joint complex. It involves partial damage or complete loss of joint congruity of the tarsometatarsal joint, with or without fractures. These injuries are considered to account for only 0.2% of all fractures of the musculoskeletal system. The aim of this study is to evaluate the epidemiological, diagnostic, therapeutic and evolutionary aspects of tarsometatarsal dislocations.
Patients and methods: This is a retrospective descriptive study conducted in the Orthopedics and Traumatology Department of the Dalal Jamm National Hospital Centre in Guédiawaye over a period of 28 months from September 2022 to December 2024.
Results: Out of a total of twelve (12) patients, seven (07) met our inclusion criteria. These included five men and two women. The average age of our patients was 33.14 years, ranging from 20 to 57 years. In terms of occupation, workers in the informal sector were the most represented (four cases). Road traffic accidents were the most common (5 cases), followed by accidents on public roads (1 case) and accidents at work (1 case). The mechanism was most often direct (4 cases) by compression. The diagnosis was based on clinical and paraclinical data. Treatment was surgical in 85.7% of cases (n = 6) and orthopedic with a circular plaster cast in one patient due to lack of resources. The foot assessment score was good in five patients and poor in one patient on day 21 post-operatively. Two cases of suppuration were noted, one of which was treated by debridement and the other by debridement and removal of the pins on postoperative day 45.
At a mean follow-up of 18.2 months, a functional assessment using the modified Wiener score was performed, with a satisfactory score for 5 patients.
Conclusion: The Lisfranc tarsometatarsal joint plays a key role in the stability of the midfoot, and its anatomical restoration through proper reduction and stable immobilization is necessary to ensure optimal functionality and painlessness of the foot.

Keywords: Dislocation, tarsometatarsal, evaluation

Introduction
The term 'Lisfranc injury' broadly refers to a group of ill-defined injuries that primarily affect the tarsometatarsal (TMT) joint complex. It involves partial damage or complete loss of joint congruity in the tarsometatarsal joint, with or without fractures [1]. Lisfranc injuries are relatively rare. With an incidence of 1 in 55,000 people each year in the United States, they are considered to account for only 0.2% of all musculoskeletal fractures. These injuries often go unnoticed, especially when caused by low-energy trauma [1, 2, 3]. There are many complications secondary to a fracture-dislocation of the tarsometatarsal joint. These can include pseudarthrosis, malalignment, post-traumatic osteoarthritis, chronic foot pain and instability, loss of normal joint range of motion, and functional deficit [1, 3]. The aim of this study is to evaluate the epidemiological, diagnostic, therapeutic and evolutionary aspects of tarsometatarsal dislocations.

Patients and Method

Patients

We conducted a 28-month retrospective analytical and evaluative single-center study from September 2022 to December 2024 in the Orthopedics and Traumatology Department of the Dalal Jamm National Hospital Centre in Guédiawaye. We included all patients with a recent fracture-dislocation of the Lisfranc tarsometatarsal joint of the foot. The exclusion criteria applied to all patients whose records could not be found.

During the study period, we collected data on 12 patients with recent fracture-dislocation of the Lisfranc tarsometatarsal joint of the foot. Of these, seven (07) patients met our inclusion criteria.

Methodology

Epidemiological, diagnostic, therapeutic and evolutionary aspects were studied

Epidemiological

- Age
- Gender
- Occupation
- Circumstances
- Mechanism
- Affected side
- Time to consultation

Diagnostic

- **Clinical:** pain, swelling, deformity
- **Paraclinical:** Type of dislocation according to the Quenu-Kuss classification [4] and associated radiological lesions

Therapeutics

- Time to treatment
- Type of treatment
- Orthopedic: Reduction plus plaster cast with boot.
- Surgical:
- Surgical technique: reduction and fixation methods
- Complementary therapy: splint, boot
- Intraoperative complications
- Length of hospital stay

Evolution

- **Follow-up:** at D21, D45 and in the medium and long term
- **Functional assessment:** According to the Wiener Modified Foot Score [5]
- **Anatomical assessment:** quality of reduction, consolidation of associated fractures
- **Complications:** infection, MOS disassembly, malunion

Results

Out of a total of twelve (12) patients, seven (07) met our inclusion criteria. These included five men and two women. The average age of our patients was 33.14 years, ranging from 20 to 57 years. In terms of occupation, workers in the informal sector were the most represented (04 cases). Road traffic accidents were the most common (5 cases), followed by accidents on public roads (1 case) and accidents at work (1 case). The mechanism was most often direct (4 cases) by compression. The trauma affected the right foot in 5 cases and the left foot in 2 cases. Four (4) patients consulted within 6 hours of the trauma, and one patient between the 1st and 3rd day.

Midfoot pain and swelling were found in all patients. All patients underwent frontal and lateral X-rays of the foot (Figure 1), two underwent lateral X-rays only, and two underwent CT scans of the foot. According to the Quenu-Kuss classification (Table I), four patients had columno-spatular dislocation, including one (01) divergent and three (03) convergent. Two (02) patients had spatular dislocation and another had columnal dislocation. Six (06) patients had fracture-dislocations of the tarsometatarsal joint of the foot, with fractures involving the base of the metatarsals in 04 patients, the cuneiform bones in one (01) patient, and the medial cuneiform bone associated with the metatarsals in one patient. One (01) patient (14.3%) had a pure dislocation. Treatment was surgical in six cases and orthopedic with a circular plaster cast in one patient (due to lack of resources). Surgical treatment consisted of broaching after reduction by external manipulation under fluoroscopic guidance (Table II and Figure 2). A plaster cast splint was applied after surgery in all patients who underwent surgery. The average length of hospitalization was 2.6 days, ranging from 1 to 4 days. All splints were removed on day 21.

We evaluated six patients, with one patient undergoing orthopedic treatment lost to follow-up. The foot assessment score was good in five patients and poor in one patient on postoperative day 21. We did not note any dismantling of material or secondary displacement.

On postoperative day 45, the foot assessment score was excellent in two patients, good in three patients and poor in one patient (Table III). We noted two (02) cases of suppuration, one of which was treated with debridement and the other required debridement and removal of the pins on day 45 post-operatively. We did not note any dismantling of the material.

At a mean follow-up of 18.2 months, a functional assessment using the modified Wiener score was performed, with a satisfactory score for five patients (excellent for three cases and good for two cases). One patient could not be reached. One (01) case of foot swelling without functional impairment was noted. No cases of deformity were found at the last follow-up. The associated fractures had healed well. The pins were removed in four (04) patients after an average delay of 3.5 months (ranging from 1.5 to 6 months).

Discussion

Dislocations of the tarsometatarsal joint are rare and poorly understood injuries. They account for 0.2% of all fractures. The initial injury is often overlooked or misdiagnosed; it is estimated that almost 20% of Lisfranc fracture-dislocations go unrecognized [1]. In our series, the study population was young (33.14 years old), with a predominance of males (M/F = 2.5). Our results are comparable to those in the literature. Diémé and Myerson found an average age of 31 years [6, 7]. The most common traumatic context remains traffic accidents, as reported by some authors, with the most common mechanism being direct compression [1, 6]. However, Myerson [7] found that 11.1% of cases involved direct crushing. This can be explained by the fact that young males remain the most active population in our regions and are more prone to road traffic accidents, and that men are much more likely to suffer crushing injuries [9]. While it is likely that these differences between men and women are

mainly due to behavioural differences and exposure, physiological differences may also contribute. Further studies are needed.

According to the Quenu-Kuss classification, columno-spatular dislocation was predominant in our series with four cases. Diémé found 63.6% of columno-spatular dislocations [6].

We had 85.7% fracture-dislocations and 14.3% pure dislocations. Diémé [6] found 63.6% fracture-dislocations and Richter found 55% fracture-dislocations [8].

Treatment was surgical in 6 cases, involving reduction by external manipulation and percutaneous fixation with pins. Anatomical reduction was achieved by external manipulation, which allowed percutaneous fixation with pins. Diémé [6] performed percutaneous fixation with Kirschner pins in 63.6% (7 patients), whereas reduction was open in 6 patients (54.5%). Myerson [7] performed open reduction in 32.7% of cases and reduction by external manipulation with fixation using Kirschner wires in 30.9% of cases.

At three weeks, we had 71.4% good results (5 cases). Between six and seven weeks, we had 28.6% excellent results, 42.8% good results and 14.3% poor results. We noted 2 cases of suppuration. Our results were slightly better than those reported in the literature. Diémé [6] found 27.3% excellent results, 18.2% good results and 36.4% poor results. Myerson [7] found 49% good or excellent results and 51% average or poor results.

We assessed our patients according to the modified Wiener functional criteria. The modified Wiener foot score was chosen because of its ease of use.

The osteosynthesis material was removed at an average of 9 weeks in our study. For Myerson [7], it was removed at an average of 6.6 weeks, and for Richter [8], at 6 weeks.

Conclusion

The Lisfranc tarsometatarsal joint plays a key role in the stability of the midfoot, and its anatomical restoration through proper reduction and stable immobilization is necessary to ensure optimal functionality and painlessness of the foot.

Conflict of Interest

Not available

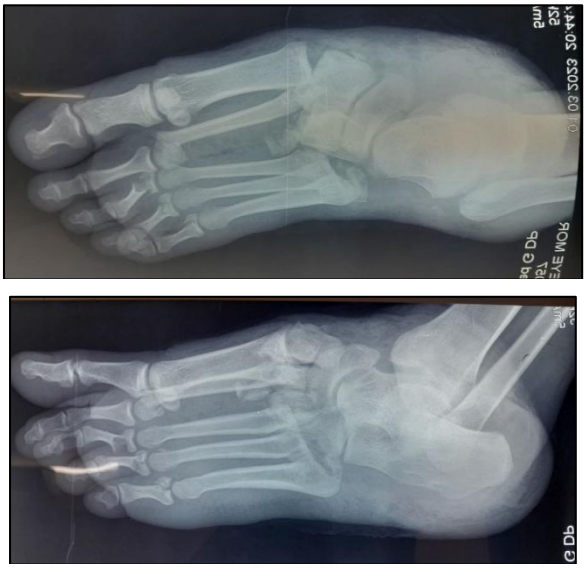

Fig 1: Lateral convergent columno-spatular dislocation

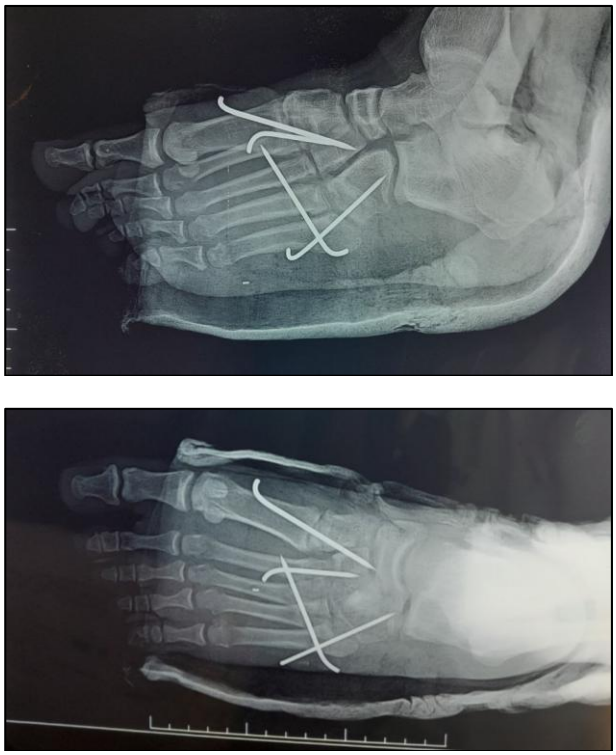

Fig 2: Pinning treatment for a Lisfranc dislocation

Table 1: Summary table of the Quenu-Kuss classification

Quenu-Kuss Classification	*Effectif*	*Percentage*
Columno-spatular dislocation **Convergent** **Divergent**	04 03 (42,8%) 01 (14,3%)	57,1%
Spatular dislocation	02	28,6%
Columnal dislocation	01	14,3%

Table 2: Summary table of the type of stapling performed during surgery (n=6)

Pinning	Effectif	Percentage
M1-C1	05	83,3%
M2-C2	03	50,0%
M5-C	04	66,6%
Inter métatarsal	04	66,6%

Table 3: Summary of patient assessment according to the modified Wiener foot score

Score	Effectif	Percentage
Low [61-70]	01	14,3%
Satisfaying [71-80]	00	00%
Good [81-90]	03	42,8%
Excellent [91-100]	02	28,6%

Conflict of Interest

Not available

Financial Support

Not available

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