

## CASE NOTE

# Lisfranc injury caused by a pedal brake perforating the foot

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**T**he tarsometatarsal joint or Lisfranc joint is a complex articulation whose stability is provided by the osseous, capsular and ligamentous attachments. Lisfranc lesions (LFLs) are commonly fracture-dislocations of the Lisfranc joint and are generally caused by high-energy trauma.<sup>1</sup> Since publication of the classification of LFLs by Hardcastle and colleagues,<sup>2</sup> based on the work by Qenu and Kuss, many papers have dealt with their anatomic patterns, treatment and prognosis, each of which is open to questions. However, the main area of controversy has been the modalities of surgical stabilization.<sup>2-4</sup>

We report the case of a patient with fracture-dislocation of the Lisfranc joint, treated surgically with the use of K-wires, in which the mechanism of injury was unusual.

**CASE REPORT**

A 30-year-old man was driving a minibus barefoot when he lost control of the vehicle, which rolled over and crashed into a tree. His right foot had slipped off the brake pedal, which was defective and not covered by rubber. The pedal pierced his inverted foot and could not be extracted manually.

On examination, the pedal was perforating the foot with the entrance wound located on the dorsal aspect and an exit wound at the plantar region (Fig. 1). The medical staff severed and removed the pedal. Radiographs showed dislocation of the tarsometatarsal joint associated with fractures of the cuboid and lateral cuneiform bones and the base of the last 4 metatarsals (Fig. 2). The patient underwent débridement, reduction and fixation of the fractures and dislocation with K-wires. There was skin loss on the dorsal aspect of the foot.



**Fig. 1.** Photograph showing the pedal perforating the foot.



**Fig. 2.** Radiograph displaying fractures and dislocations of the Lisfranc joint.



**Fig. 3.** Radiograph 15 months after the injury shows the fused metatarsocuneiform joint, with osteoporosis of the cuboid and the metatarsals.

The wound became infected postoperatively but responded to treatment with dressings and antibiotics. A split-thickness skin graft was needed. Three months after the injury, the patient was able to bear weight. At follow-up after 15 months, there was a retractile scar at the lateral aspect of the foot. Radiographs disclosed a fused metatarsocuneiform joint, and osteoporosis of the cuboid bone and the metatarsals (Fig. 3).

The patient refused to have the wires removed. He resumed his preinjury activities but experienced residual pain on prolonged walking.

## DISCUSSION

Lisfranc lesions are rare but severe injuries. They account for 0.2% of all fractures, but more than 20% of such injuries are missed.<sup>2,4</sup> In our patient's case, the major soft-tissue lesions initially indicated the severity of the LFLs.

The long-term results were hampered by the residual pain. Increasingly, LFLs are classified according to the columnar theory. The metatarsals within a column function as a unit. It is unusual for one metatarsal to dislocate while another remains in an anatomic position.<sup>3</sup> In our patient's case, the last 4 metatarsals were involved with their corresponding tarsometatarsal joints.

The mechanisms of injury of LFLs are varied, but motor vehicle collisions are the main cause.<sup>5</sup> Our patient sustained his injury in a motor vehicle collision, but the mechanism of injury was unusual. Typically, the foot is trapped under the brake pedal.<sup>5</sup> In our case, the defective pedal perforated the dorsal aspect of the foot while the patient was driving without shoes. This case report stresses the importance of good vehicle maintenance and appropriate footwear for the driver.

**Competing interests:** None declared.

## References

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