

Lisfranc fracture-dislocation with associated ipsilateral ankle fracture

Fractura-luxación de Lisfranc con fractura de tobillo ipsilateral asociada

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ABSTRACT

Lisfranc fracture dislocation is a rare entity which often occurs in a high energy context. Meanwhile, bimalleolar or trimalleolar fractures are much more common, and can happen in both low and high energy. However, both lesions rarely occur together. As far as we know, it has only been described twice in the literature.

We present a case series of two cases consisting of Lisfranc fracture-dislocation plus associated bimalleolar or trimalleolar fracture, which were correctly diagnosed and furthermore treated in our center within a 3-year follow up.

Keywords: Lisfranc fracture dislocation; ankle fractures; treatment.

RESUMEN

La luxación por fractura de Lisfranc es una entidad rara que a menudo ocurre en un contexto de alta energía. En tanto, las fracturas bimalleolares o trimaleolares son mucho más comunes y pueden ocurrir tanto en baja como en alta energía. Sin embargo, ambas lesiones rara vez ocurren juntas. Hasta

donde sabemos, sólo se ha descrito dos veces en la literatura. Presentamos una serie de dos casos consistentes en fractura-luxación de Lisfranc más fractura bimalleolar o trimaleolar asociada, que fueron correctamente diagnosticadas y además tratadas en nuestro centro con un seguimiento de 3 años.

Palabras clave: luxación por fractura de Lisfranc; fracturas de tobillo; tratamiento.

Recibido: 23/08/2023

Aceptado: 30/08/2023

Introduction

Lisfranc injuries are uncommon, representing about 0.2 % of all fractures.⁽¹⁾ They are usually caused by high energy direct axial loading trauma or by indirect trauma with a plantar flexed foot. However, some of them can take place with low energy trauma. In fact, 20 % of these lesions can be misdiagnosed leading to midfoot desalination and future posttraumatic arthritis.

Ankle fractures are, on the contrary, one of the most common injuries that an orthopedic surgeon daily faces. They are usually caused by a twisting mechanism. Up to 70 % are only peroneal malleolus fractures, while 20 % are bimalleolar and 7 % trimalleolar.⁽²⁾

Combination of both injuries is rare, as the injury mechanism is different. But in some cases, as occurred to the patients we want to introduce, high energy trauma includes combined mechanisms, resulting in both lesions at the same time. As far as we know, this has only been reported twice in the literature.^(3,4)

We present a case series of two cases consisting of both, Lisfranc injury and ankle fracture, produced at the same time after a high energy trauma. Both patients were informed that data concerning the case would be submitted for publication and they provided consent.

Case description

Case number 1 is a 19 years old woman, otherwise healthy, who was hit by a car. She arrived at the Emergency Room with swelling of her left foot and a second grade burning lesion on her left dorsal midfoot. She presented tenderness all over her midfoot and ankle. No sign of open fracture was appreciated. Plain non bearing X-ray were performed, showing trimalleolar fracture and 3-4-5th metatarsal basal fracture-dislocation (fig. 1).



Fig. 1 - Case 1 x-rays at her arrival to ER.

She had foot surgery by foot unit surgeons with K-wires fixing Lisfranc lesion and cannulated screw for medial and posterior malleolus (fig. 2). Peroneal fracture was considerably proximal and did not show any shortening or syndesmosis affection, so we decided on conservatory treatment. Patient was discharged two days later.



Fig. 2 - Case 1 postoperative x-rays.

Case number 2 is a 30 years old healthy man who had a motorbike accident. He presented pain and tenderness in all over his right ankle and midfoot. Non-bearing X-ray were performed, showing non-displaced transindesmal fibula fracture plus complex Lisfranc fracture-dislocation (fig. 3). An urgent computerized tomography (CT scan) was performed, showing in detail second, third and fourth radius tarsal metatarsal fracture-dislocation (fig. 4).



Fig. 3 - AP and oblique x-ray in case 2 at his arrival to ER.



Fig. 4 - Preoperative CT scan in case 2 showing Lisfranc fracture-dislocation.

He underwent foot surgery by foot unit surgeons, with cannulated screws arthrodesing second, third and fourth cuneiform-metatarsal articulations (fig. 5).



Fig. 5 - Preoperative CT scan in case 2 showing Lisfranc fracture-dislocation.

Both patients followed the same postoperative indications, including deep venous thromboprophylaxis and non-weight bearing for 6-8 weeks. After that time and after x-ray showed fracture consolidation, K-wires were removed from patient 1. Also both patients were allowed to start controlled progressive bearing using a Walker postoperative boot.

Both patients underwent excellent clinical follow up for three years (figs. 1, 2).

Patient 1 is currently pain free. 20 weeks after surgery she returned to her habitual sport practice with mild limitations, and she presented a 82/100 AOFAS score.⁽⁵⁾ 1-year after surgery. Patient 2 has occasional mild pain, and he is also doing all sports except running, presenting a 1-year post-intervention AOFAS score of 77/100.

Discussion

Lisfranc injury is infrequent and potentially severe if not treated. It can lead to chronic pain and foot arthritis resulting in gait impairment. That is why its early diagnosis is crucial. It is known that about 20 % of all cases are not initially diagnosed, usually because they happen after low energy traumatism. So after any clinical suspicion, we should ask for a CT scan or MRI to confirm the diagnosis.

In our case good clinical exploration detecting both ankle and foot tenderness was also important to diagnose both fractures. In fact, presenting at the same

time an ankle fracture is even more rare. As far as we know, it has only been described twice in literature. That is probably due because a different trauma mechanism is needed for causing both injuries. These mechanisms are axial loading for Lisfranc injury and ankle twisting for ankle fracture. In any case, the presence of both lesions is probably related to high energy trauma, when we usually see combined trauma vector lesions.

In case 1 we chose temporary 1.5mm K-wires for treating Lisfranc injury due to adverse soft tissue status. She presented a second grade skin burning which compromised the anterolateral dorsal midfoot. This technique is supported in literature to treat it with associated soft tissue injuries.⁽⁶⁾

Case 2 was treated with 3.2mm headless compression screws as it was the most familiar technique for the main surgeon. Screws are a valid and versatile method to fix Lisfranc injuries. Ho NC *et al.* described no statistical difference between plates and screws in biomechanical results.⁽⁷⁾

Case 2 presented mild occasional pain and could not return to running but yet to other physical activities. Unfortunately, mild pain is a frequent sequelae in some patients. Part of them do not fully recover despite best management. However, MacMahon A *et al.* found in their revision that the majority of patients in their study were able to return to their previous physical activities. Compared to pre-injury, patient levels of participation were the same or improved in 75 %.⁽⁸⁾

McHale KJ also found that ninety-three percent of the athletes were able to return to play at an average of 11.1 months following injury.⁽⁹⁾ The debate between open reduction internal fixation (ORIF) versus primary arthrodesis is still controversial in Lisfranc injuries. Case 1 had an ORIF as she had hardware removal (K-wires), while Case 2 had primary arthrodesis. Literature shows different interesting results. Henning JA *et al.* determined in a prospective, randomized trial, that primary arthrodesis significantly reduced the rate of both planned and unplanned secondary surgeries relative to ORIF alone.⁽¹⁰⁾

ORIF with primary arthrodesis also appears to yield good results for combined bony and ligamentous patterns.⁽¹¹⁾

Conclusion

Lisfranc and associated ankle fracture is a rare entity which should be suspected in high, multivectorial traumatism.

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Conflict of interests

The authors declare that there is no conflict of interest.