CASE REPORTS

Charcot Foot Diagnosis – Still an Issue?

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Abstract

The Lisfranc fracture-dislocation of the foot is uncommon and many cases are misdiagnosed. A neglected or untreated injury of the Lisfranc joint can lead to secondary arthritis and significant morbidity with disability. In this paper we described pacient's recent medical history that led to Lisfranc lesion and our means of diagnosis and treatment. The chosen implant was a limited contact plate 3.5 mm (LCP) with screws and screw fixation, and temporary Kirschner (K) wire fixation (6 weeks). The main objectives of the treatment consists in anatomical reduction associated with an early mobilization in order to avoid mineral bone loss and to keep the patient as close as possible to the fullest of its function prior to the event that has led to his static and kinematic disorder. After three months the follow-up was excellent.

Keywords: Lisfranc fracture-dislocation, anatomical reduction, early mobilization

Rezumat

Fractura-luxație Lisfranc a piciorului este destul de rară și diagnosticul este, în multe cazuri, ratat. O leziune neglijată sau netratată a articulației Lisfranc poate conduce secundar la o artrită și o morbiditate locală, precum și la un handicap semnificativ. În această lucrare am descris antecedentele medicale recente ale pacientului care au condus la leziunea Lisfranc și mijloacele noastre de diagnosticare și tratament. Pentru stabilizare s-a utilizat o placă cu contact limitat de 3,5 mm (LCP) cu șuruburi și fixare prin șurub precum și o osteosinteză temporară cu broșe (6 săptămâni). Obiectivele principale ale tratamentului constau într-o reducere anatomică și o mobilizare precoce pentru a evita scăderea densității minerale osoase și pentru a menține pacientul cât mai aproape de funcția anterioară evenimentului care a condus la tulburarea sa statică și cinematică. Urmărirea la 3 luni a fost excelentă.
Cuvinte cheie: Fractura-luxatie Lisfranc, reducere anatomică, mobilizarea precoce

INTRODUCTION

The Lisfranc fracture-dislocation of the foot is uncommon and many cases are misdiagnosed. The Lisfranc lesion involves the medial cuneiform and base of the second metatarsal which are considered to be the keystone of the structural integrity of the midfoot. This joint has a stabilization effect on longitudinal and transverse arches of the foot. A neglected or untreated injury to the Lisfranc joint can lead to secondary arthritis and significant morbidity with disability. Furthermore, it is well known the correlation between pacients with periferic neuropathy and this type of lesion, also known as Charcot Foot[1]. It has been documented to occur as

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a consequence of various peripheral neuropathies, but diabetic neuropathy has become the most common etiology[2]. The interaction of several component factors (diabetes, sensory-motor neuropathy, autonomic neuropathy, trauma and metabolic abnormalities of bone) result in an acute localized inflammatory condition that may lead to various degrees and patterns of bone destruction, subluxation, dislocation, and deformity[1-3]. In this paper we described pacient's recent medical history that led to Lisfranc lesion and our means of diagnosis and treatment. The implant we chose was a limited contact plate 3.5 mm (LCP) with screws and screw fixation, associated with temporary Kirschner (K) wire fixation (6 weeks). The main objectives of this treatment consist in anatomical reduction and an early mobilization. After three months the follow-up was excellent. This case presentation relies on the precocious diagnosis and management of Charcot foot underlying their importance in obtaining a good prognosis with a high quality of life outcome in these patients.

CASE REPORT

A 54-year-old male pacient presented at our emergency department with a deformating swelling at the left mid-foot and an increased local temperature (Figure 1 – Figure 3). The pacient was able to sustain full weight barring, walk with moderate to little pain and had no recent memory of local trauma. He was diagnosed with type II diabetes for 10 years, without following a very effective treatment (in the time spent at our hospital, his glycemic rates were constantly above 170 mg/dL). In 2014, due to a miss footing, the patient fractured his left external maleoli (the same side as the one with increased temperature and deformity) for wich he chose an orthopedic treatment with cast. In early 2016, he returned to the orthopedic emergency department and was diagnosed with a sprained left ankle. Two months afterwards, the pacient came back to our hospital and was admited by our team for more investigations.

Initially, the patient took plain radiographs (X-rays) (Figure 4 – Figure 6) and after a few days of bed rest with elevated foot and local cold dressing to reduce the swealling, he underwent a computed tomography scan (CT exam) (Figure 7 – Figure 12). Surgery was performed under spinal anesthesia with the patient in supine position. Spinal anesthesia is an effective and safe option when the surgical site is located on the lower extremities. The main advantages of this technique are: reducing the metabolic stress response to surgery and the blood loss, providing pain relief for more hours with a greater comfort, decreasing the incidence of venous thromboembolism and pulmonary compromise. We used two anterior approaches corresponding to the projection of the metatarsals and then K wires with

Figure 1. Deformating swelling at the left mid- foot – medial view.

Figure 2. Deformating swelling at the left mid- foot – dorsal view.

Figure 3. Deformating swelling at the left mid- foot – lateral view.

Figure 4. Admission X-ray – antero-posterior view.

Figure 6. Admission X-ray – antero-posterior view.

Figure 5. Admission X-ray – lateral view.

Figure 7. CT-scan of the left foot.

pointed bone holding forceps to obtain a proper alignment of the foot followed by fixation using a limited contact plate 3.5 mm (LCP) with screws both on the 1st metatarsal and the tarsal bones in an antero-posterior way and two partially threaded screws that maintain the proper alignment of the 2nd and 3rd metatarsal and the tarsal with one screw that keeps metatarsal I to III joined. We decided to keep the k-wires on the 4th and 5th metatarsals for the next 6 weeks (Figure 13, Figure14). Weight bearing was not allowed for 8 weeks

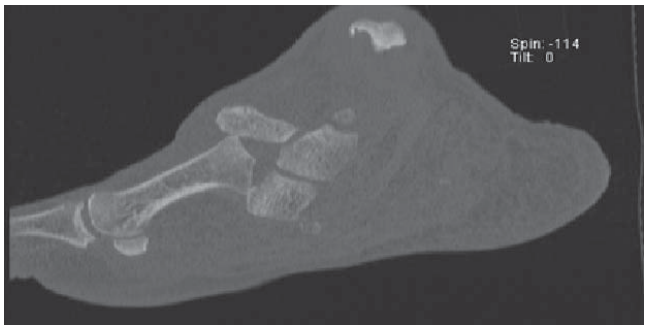

Figure 8. CT-scan of the left foot.

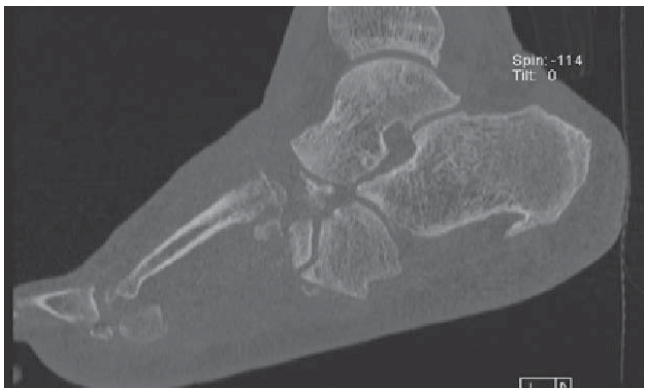

Figure 9. CT-scan of the left foot.

Figure 10. CT-scan of the left foot.

after which the patient was allowed to walk while having a protective orthesis – walker type. Antithrombotic prophylaxis was ensured using Dalteparinum 5000 UI/daily subcutaneous administered for 8 weeks. A single dose of Cefuroxime 1.5 g single dose was used as perioperative antibiotic prophylaxis, with no further antibiotic treatment.

At 14 weeks follow-up, the pacient walked fully weight bearing and did not use crutches or any other walking devices other than the Walker orthosis. The X-ray revealed excelent results (Figure 15 and Figure 16).

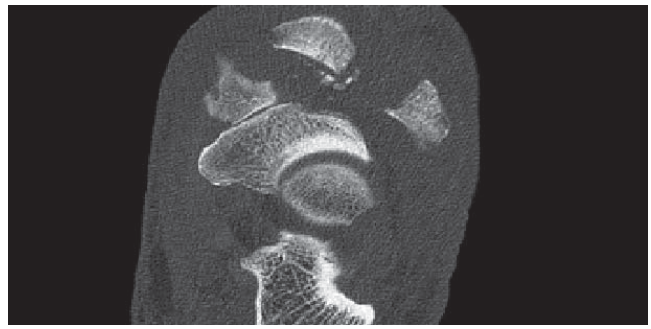

Figure 11. CT-scan of the left foot.

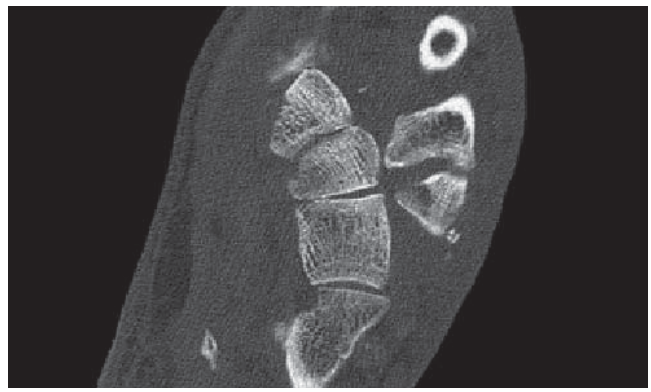

Figure 12. CT-scan of the left foot.

Figure 13. Postoperative X-ray antero-posterior view.

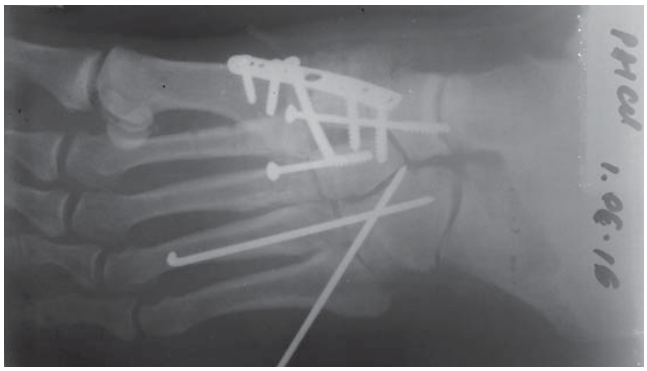

Figure 14. Postoperative X-ray, K-wires inserted.

Figure 15. X-ray follow-up at 14 weeks.

Figure 16. X-ray follow-up at 14 weeks.

DISCUSSIONS

The prevalence of diagnosed Charcot arthropathy in patients with diabetes is reported to be 0.08–7.5%[4], although some studies suggest higher prevalence, such as 13% of all diabetic patients and 29% of the neuropathic patients[5].

For the past decades, the gold standard treatment for Lisfranc injuries has been plaster external fixation and Kirschner wire[6]. This method requires basic surgical experience with no specialized skills and it is cost-effective, however, the therapeutic efficacy is poor and it is difficult to reach and maintain anatomical reposition[7]. Prompt surgery is important for improving the prognosis, and delayed surgery may cause serious complications such as necrosis, amongst others[8,9]. Large-diameter axial screws, plantar locking plates, and external fixators are considered to be suitable implants for this procedure. The Ilizarov external fixator frame is useful to compress bone segments and to achieve joint fusion, bridge across sites of infected bone, and allow offloading and access to plantar wounds[10]. The primary advantage of the use of a locking plate along the medial and/or lateral column is the resistance to strain across the fusion site[11,12]. As far as the surgical technique goes, we could have chosen external fixation or large diameter axial screws. Our choice of treatment follows the mentioned principles and targets, as main objective, an anatomical reduction with early mobilization in order to avoid mineral bone loss and to keep the patient as close as possible to its fullest function prior to the event that has led to his static and kinematic disorder. The choice of implant and the approach used has proven to be the right option in this case confirmed by the postoperative results, and the excellent follow-up.

CONCLUSION

From our point of view, first and the most important step in treating this pathology is the diagnosis and afterwards the right surgical/orthopedic treatment. This case confirms the importance of a fast diagnosis and correct surgical treatment for preventing moderate to severe disabilities and obtaining a good health-related quality of life outcomes in patients with Charcot foot.

Conflict of interest: none declared.

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