Neglected Lisfranc's Joint Injury: A Case Report and Literature Review

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ABSTRACT

The Lisfranc's joint fracture dislocation involves the articulation between medial cuneiform and base of second metatarsal, which is considered as keystone to the mid foot integrity. The articulation has stabilization effect on longitudinal and transverse arches of the mid foot. Non operative or suboptimal treatment has grave complications and aftermath. Lisfranc's joint includes tarsometatarsal complex and injury to the region is a rare occurrence. Neglected or undertreated injury to Lisfranc joint complex leads to secondary arthritis and significant morbidity and disability. This uncommon pattern of injury is often missed on initial or poorly done radiographs. We present a report of six weeks old neglected Lisfranc's joint injury with surgical management and satisfactory functional outcome.

Key Words: *Lisfranc Joint, Tarsometatarsal joint, Injury, Foot Injury, Management, Internal Fixation*

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INTRODUCTION

Lisfranc's joint fracture dislocation is an eponymous rare foot injury named after Lisfranc, Napolean's surgeon, also famous for named amputation through tarsometatarsal joints. These are uncommon injuries with reported incidence of 0.25% of all fractures.[1] High energy mechanisms of injuries like motor vehicle trauma, falls or crushing are common etiologies.[1] Axial rotational loading over a plantar flexed foot leading to rupture of plantar ligaments with or without fracture of base of metatarsal, is indirect mechanism of injury.[2] The injury is commonly missed as a result of gross swelling and subtle findings in radiological evaluation which requires careful attention to detail. Relook after the decrease of edema for persistent pain and aggravation of pain or instability on stress examination warrants further evaluation to diagnose underlying injury.[3] The chances of missing the Lisfranc's joint injuries in multiply injured cases may be up to 20-30% and careful assessment is mandatory to rule out the probability of this condition.[4] The Lisfranc's joint injury pattern is notorious for developing secondary arthritis if left untreated or treated with incongruity.[5]

CASE REPORT

A 32 year old male patient presented to us with discomfort on walking and difficulty and pain following long duration of weight bearing on his left foot. There was history of injury to the same foot six weeks ago for which he consulted certain local practitioner and was given rest and pain medication with a provisional diagnosis of minor strain and without any radiological bony injury. He followed the advice and after some relief from pain and swelling started activities of daily living with mild pain and swelling on prolonged weight bearing which was again explained as common sequelae of musculoskeletal injury to foot and ankle region. As the pain and disability increased from last five days, the patient presented to us in the emergency for evaluation and further treatment.

The radiograph of the affected foot showed Lisfranc fracture dislocation with wide displacement of second tarsometatarsal joint with other corresponding joints laterally (Fig. 1a). There was no fracture visible. His very first radiographs were carefully evaluated to show 'fleck sign' which is a subtle indicator of Lisfranc's fracture dislocation that was missed during previous consultation (Fig. 1b). The sign is the presence of certain bony irregularities or pieces of bone adjacent to the second tarsometatarsal joint region and suggest joint injury like dislocation. Missing this subtle indicator resulted in later displacement as well as delayed diagnosis.

He was advised surgical intervention with open reduction and internal fixation with multiple screws as per standard protocol described for the condition. A dorsal incision over the foot was used and the reduction achieved and held by pointed reduction clamps. A total of three 4.5 mm cortical screws were used to hold the reduction and stability of which was assessed clinically and under image intensifier during the procedure (Fig. 2). Meticulous lavage and delicate tissue handling was done while closing the wound followed by a protection plaster below knee splint. The post-operative period was uneventful except delayed healing after wound dehiscence (Fig. 3a). The stitches were removed and

wound allowed healing successfully with secondary intention after three weeks (Fig. 3b). A supervised physiotherapy of ankle and toes ensured early return of pain free range of motion.

Fig. 1: Initial radiograph showing the 'fleck sign' suggestive of Lisfranc's joint injury that was missed

Fig. 2: Present radiograph of displaced injury

Fig. 3: The post operative radiograph showing the fixation

Fig. 4: Wound dehiscence (a) and healing by secondary intention (b)

RESULT

The fracture dislocation had sound healing on serial follow up radiographs and the wound healed with no complication after that. The implants were removed on patient request after eighteen months with minimal percutaneous methods. The patient has been involved in activities of daily living with no pain and disability.

DISCUSSION

Co linearity of medial border of second metatarsal with medial border of medial cuneiform and that of medial border of fourth metatarsal with medial border of cuboids on antero-posterior view are described radiological assessment features.[6] A small fracture of either medial cuneiform of base of second metatarsal, referred as 'fleck sign' by Myerson is a diagnostic feature if found.[7] Subtle or minor form of injuries are often overlooked owing to the misinterpretation of radiographs. Urgent, early and anatomical reduction has been reported to result in minimal disability and optimum outcome. We explained all the pros and cons of each option to the patient with prognosis and he was advised open reduction owing to younger age and his preference.

Any displacement greater than 2 cm or 15 degree of angulations has been consistent with poor outcome.[5,8] The reduction and internal fixation of these injuries is indicated to avoid the aforementioned complication and that can be done either open or percutaneous methods. Open reduction with screw or wire fixation has been found to be good modality of treatment with satisfactory outcome.[9,10] Even in delayed presentation after seven months in the settings of secondary arthrosis, an attempt of anatomical open reduction has been found to be of significantly better outcome.[11] Chronic cases can also be managed with the help of arthrodesis of tarsometatarsal joint resulting in painless foot.[12]

Yamamoto et al have found interposition of anterior tibial tendon in cases or irreducible lateral dislocation and advocated that this fact should be searched in such cases.[13] One recent report of one month old case was successfully managed with Wagner's external fixator along with screws.[14] Overall open reduction has been attempted with good to excellent outcome in reported literature for neglected injuries.

CONCLUSION

Neglected or missed injury to Lisfranc's joint complex is debilitating condition with secondary arthrosis and persistent pain. Carful assessment of radiograph is essential to catch suspected injury for effective and timely management. Neglected, old cases can also be managed by standard treatment with operative fixation with good functional outcome.

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CONFLICT OF INTEREST: None.

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