ECRONICON OPEN ACCESS

ORTHOPAEDICS
Case Report

How a Minor Trauma can Cause Long Term Disability! A Misdiagnosed Fracture of Lateral Process of the Talus-A Case Report and Review of Literature

Mr. Mohammed K.M Ali[1]*, Dr. Chibuogwu Mbah[1], Dr. Ahmed Alwadiya[1], Mr. Stephen Milner[2]

[1]Junior Clinical Fellow, Trauma and Orthopaedics, Royal Derby Hospital, United Kingdom.

[2]Consultant, Foot and ankle, Royal Derby Hospital, United Kingdom

***Corresponding Author:** Mohammed KM Ali, Junior Clinical Fellow, Trauma and Orthopaedics, Royal Derby Hospital, United Kingdom.

Received: June 02, 2015; **Published:** June 15, 2015

Abstract

Introduction: Despite increasing number of literature and publication on talus lateral process fracture, early diagnosis with this fracture is still missed leading to awful long term complication especially the younger ones.

Case presentation: A 42 year old male slipped down one step and sustained a combined inversion and dorsiflexion strain of his left ankle and foot. There was immediate pain, difficulty in mobility with subsequent swelling. Patient was seen in Emergency department and follow-up clinics and based on clinical and radiological examination a diagnosis of sprain was made and treated accordingly. Six months down the line with unsettling symptoms, GP referred him to orthopaedics clinic for specialist opinion where MRI showed lateral talus fracture.

Discussion: The complications following delayed diagnosis of these fractures can be disabling so high index of suspicion even with minor ankle injuries as in this case is required to surmount this delayed diagnosis.

Conclusion: We conclude that the diagnosis of lateral talus process should be considered in the differential diagnosis of patients with acute and chronic ankle pain and to arrange an early orthopedic referral along with CT scan to enable prompt management.

Keywords: *Keywords: Trauma; Talus A; Misdiagnosis; Fracture*

Introduction

Fractures of the lateral process of the talus are not common when compare to other foot and ankle injuries. Most of the time they are missed on the initial radiographs and patients re-present with persistent or worsening symptoms. Early diagnosis and treatment are very important in preventing long term complications such as subtalar pain, stiffness and arthritis [1], so it should be considered in the differential diagnosis of patients with acute and chronic ankle pain [2]. Herein we report a case of a lateral talus process fracture that was misdiagnosed, mainly because it was a minor injury and no body thought about it as a possibility. We would like to raise the awareness among the medical practitioners and to emphasis the importance of ruling out these fractures.

Case Report

A 42 year old gentleman attended Emergency Department with left ankle pain and difficult mobility due to pain. He presented a history of slipping down one step and sustaining a combined inversion and dorsiflexion strain of his left ankle and foot. There was immediate pain, difficulty in mobility with subsequent swelling. On examination in Emergency department, the ankle and foot were slightly swollen, tender but has good range of movement and neurovascularly intact. X-rays (Figure 1) showed no obvious fracture and a diagnosis of sprain was made and treated accordingly.

Figure 1: *1st X-rays in Emergency department.*

He attended Emergency department clinic one week post injury following unsettling symptoms and again the diagnosis was thought to be sprain. Physiotherapy was arranged within the department and he managed to get back to work despite ongoing pain. A repeat x-rays (Figure 2) were taken two months post injury which did not clearly show this fracture but with power of hindsight, lateral process was definitely abnormal with lots of soft tissue injury. The patient was still having continuous limping, persistent pain, unable to tiptoe as well as inability to perform inversion exercise and that prompted suspicion of both Achilles tendon and tibialis posterior tendon rupture. Ultrasound was done and it excluded Achilles tendon rupture.

Figure 2: *2 months later.*

Following this, GP referred him to orthopaedics clinic for specialist opinion and that was almost 6 months down the line from the injury time. MRI scan was organized to rule out suspected Tibialis posterior pathology as well as any other cause for the persistent swelling and limp. MRI showed lateral talus fracture with lots of soft tissue edema. More importantly, subsequent CT scan was organized for treatment planning showed patient had developed secondary osteoarthritic changes in his subtalar joint as well as non union of the fragment as shown in figure 3.

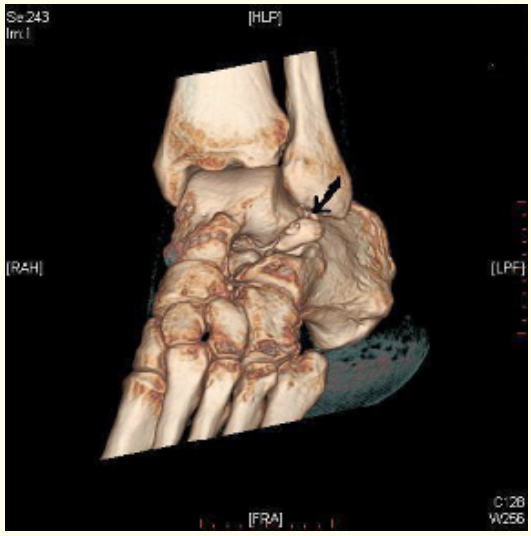

Figure 3: *CT shows non union of the fracture.*

Prior to surgery patient was suffering from severe foot pain which was significantly affecting his mobility and subsequently his job. Unfortunately this young man ended up with posterior subtalar arthrodesis following delayed diagnosis of this fracture as shown in figure 4.

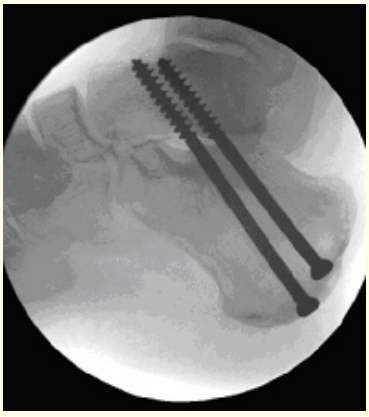

Figure 4: *posterior subtalar arthrodesis.*

Discussion

Historical Background

Fractures of the lateral process of the talus are rare, often overlooked initially and misdiagnosed as severe ankle sprain. Misdiagnosis can lead to mal-union, non-union and degenerative changes [3]. Marottoli was the first one to report this type of fractures. He reported 10 cases in 1942 [4], followed by Bonnin in 1950 [5] who described this fracture and suggested plaster immobilization for eight weeks to be an appropriate treatment [6]. In 1961 Dimon [7] after looking into three cases, he pointed out that they could lead to considerable

disability. Followed by Leland G and Hawkins in 1965 [8]. They reported thirteen fractures of this type from a series of fifty consecutive fractures of the talus. The initial diagnosis was frequently missed and six months later six of the thirteen patients had pain with standing or walking sufficient to warrant exploration. This was followed by another thirteen cases reported by Mukherjee in 1974 [9]. Heckman in 1985 [10] retrospectively reviewed nine patients with fractures of the LPT and he concluded that ; if untreated, these fractures often fail to heal, and any persistent pain over the lateral aspect of the ankle following an inversion injury should be investigated for the possibility of this diagnosis.

Anatomy

The lateral process is a triangle-shaped osseous protuberance that articulates superolaterally with the lateral malleolus. The inferior apex is directed at the calcaneal floor of the sinus tarsi while the posterior margin articulates with the edge of the posterior facet of the subtalar joint. Thus, the fracture is a dual intraarticular lesion is it involves both of these joint structures [12]. The lateral process of the talus also provides local attachment for the cervical, bifurcate, anterior talofibular, and lateral talocalcaneal ligaments. Lying anterior and slightly superior to the calcaneofibular ligament, the lateral talocalcaneal ligament is actually a thickening of the lateral capsule of the subtalar joint that resists the separation of its articular surfaces. With all these ligament attachments, it is important to note that some injuries may be avulsion fractures

Mechanism of Injury

The sport of 'snowboarding', which is gaining in popularity, has been significantly associated with fractures of the lateral talar process [13], leading some authors to dub this fracture 'Snowboarder's Fracture'. Ankle is involved in about 15% of snowboarding related fractures. A fracture to the Lateral process of the talus in snowboarder's, may account for as many as one third of ankle fractures in this population [3,14], but also it can happen with any other sport. It has been reported as stress fractures in tennis players [15], runners [16] and also footballers [17]. Also It can happen in any age group, Leibner., *et al*. [18] reported two cases , one in a 9-year-old girl and one in an 11-year-old boy, the latter associated with talar neck and body fractures.

Milch in 1959, proposed that the mechanism of injury was ankle inversion [19]. Hawkins [8] thought that the fracture was caused by severe dorsiflexion and inversion. In 1968, Fjeldborg [20] discussed the mechanism of injury and described both dorsiflexion and supination as important forces contributing to the injury. Following them, Mukherjee in 1974 [9] indicated that; The mechanism of the injury in the thirteen cases he reviewed, would appear to be inversion strain of the foot with dorsiflexion of the ankle. Then Kleiger. [21] suggested the fracture must occur as a result of the posterior calcaneal facet striking the posterior margin of the lateral talar articular surface during extension and that because no strong ligament is attached to the lateral process of the talus. McCrory in 1996 [22] did a comprehensive literature review and the report concluded that; The mechanism of this injury appears to be a combination of dorsiflexion and inversion of the ankle. In 2002 Srinivasan., *et al*. [23] managed to create this injury using cadavers to force a talus fracture. They applied the motion snowboarders go through when falling forward. The leading leg turns toward the front of the board, putting the weight of the body over the inside of the ankle. The amount of motion and force was measured for each test. After each test the ankle was examined for injury. The study suggested eversion of an axially loaded and dorsiflexed ankle may be an important injury mechanism in snowboarders. Helen J Mills [24] in 2008 retrospectively reviewed nine patients who sustained isolated fractures of the lateral process of the talus. The majority were caused by inversion or a combination of inversion and dorsiflexion of the foot.

Classification

Hawkins [8] classified three types of lateral process fractures; first type is simple fracture extending from the Talofibular to the Talocalcaneal joint. The second type is comminuted involving the entire lateral process and the third type is chip fracture anteroinferiorly involving only the subtalar joint. AO Classification: type 1 fractures do not involved the articular surface type 2 fractures involve the subtalar and talofibular joints type 3 fractures have comminution

Imaging Modalities

Due to the complex anatomy of the region, these fractures are difficult to detect by standard radiographs [25], however Mukhrejee [9] suggested that if radiographs of good quality were taken with the ankle at 0 degree and the leg rotated inwards 10 to 20 degrees that should help in visualizing these fractures, which some may argue that it is not applicable for all patients and Once fracture is suspected on the basis of physical examination, computed tomography (CT) is the best modality to confirm the diagnosis and accurately appreciate the number of the fragments and their position which have therapeutic consequences [25]. In 1992 Jukka Kettunen [26] reported this fracture in his colleague, a vascular surgeon, who sustained this injury when sprained his ankle running up a flight of stairs. Arthrography demonstrated leakage into the region of the anterior fibulotalar ligament and into the tibialis posterior tendon sheath, but not into the peroneal tendon sheath or subtalar joint. At operation they found dislocated biarticular fracture of the lateral talar process consisting of 20 x 20 mm of the fibular facet and 10 x 20 mm of the lateral subtalar facet. Ebraheim., *et al*. [27] used CT scan in the evaluation of a fractured process of the talus in 10 patients and it was found to be very accurate in assessing the size, displacement, and comminution of the fractured process. CT scans also showed the extent of subtalar joint involvement, any associated tendon pathology, or additional fractures. In two patients the nature of the injury was initially missed, and CT scan diagnosed a non union of the lateral process. In all patients, CT scan altered the management of the fracture or helped in selecting the surgical approach.

T.J Sanders in 1999 [28] reported a case of 59 year old man who had MR imaging to evaluate for soft tissue injury but found to have lateral process fracture of the talus. He strongly suggested that radiologist should consider evaluating the talus process as routine every time they perform MR to evaluate soft tissue for acute/chronic ankle pain. A better knowledge of these lesions seems necessary to the general radiologist to allow an early diagnosis in order to avoid chronic sequel.

Copercini in 2003 [29] suggested that coronal sonograms of the LPT must be a part of routine post-traumatic ankle sonographic examination as sonography can show radiographically occult LPT fractures. For demonstration of fracture displacement and fragmentation, computed tomography and MRI remain the preferred imaging modalities and should be used for choosing the proper treatment.

Conclusion

Doctors need to know about this injury because it often looks just like an ankle sprain. Yet without proper treatment, a talus fracture can have a bad result. The fracture may fail to heal, eventually causing Arthritis. Arthritis can cause pain and disability and these may lead to more aggressive surgical procedures. Once suspected on the basis of physical examination, computed tomography (CT) is the best modality to confirm the diagnosis.

Bibliography

1. Reber P, *et al*. "Fractures of the lateral process of the talus". *Unfallchirurg* 94.3 (1991): 153–156.
2. Tucker DJ, *et al*. "Fractures of the lateral process of the talus: 2 case reports and a comprehensive literature review". *Foot & Ankle International* 19 (1998): 641-646.
3. www.rcsed.ac.uk/fellows/lvanrensburg/classification/ankle/lat_process_talus.htm#
4. Marotolli OR. "Sobre las fracturas de la apofisis externa del astragalo". *Rev Ortopy Traumatol*, 1943; 13:107-17.
5. Bonnin]G. Injuries to the ankle. New York: Grone & Stratton, 1950.
6. Nicholas R., *et al*. "Snowboarder's Fracture: Fracture of the Lateral Process Of The Talus". *Journal of the American Board of Family Medicine* 7.2 (1994): 130-133.
7. DIMON, J, H. "Isolated displaced fracture of the of the posterior facet ofthe talus". *Journal of Bone and Joint Surgery* 43.A (1961): 275-281.
8. Hawkins LG. "Fracture of the lateral process of the talus: a review of thirteen cases". *Journal of Bone and Joint Surgery (A pt 2)* 47 (1965): 1170-5.
9. Mukherjee SK., *et al*. "Fracture of the lateral process of the talus. A report of thirteen cases". *The Bone & Joint Journal* 56.2 (1974): 263-273.

10. Heckman JD., *et al*. "Fractures of the Lateral Process of the Talus". (121): 243-262.
11. Barnett. TM, and Teasdall RD "Bilateral lateral process fracture of the talus in a motocross rider". *Foot & Ankle International* 29.2 (2008): 245-247
12. Platzer W. "Colour Atlas of Human Anatomy". *Locomotor System* (5th edn). *Thieme* (2004): 3-13-533305-1.
13. Douglas PK., *et al*. "The Snowboarder's Foot and Ankle". *American Journal of Sports Medicine* 26.2 (1998): 271-277.
14. Snowboarding Injuries. Jason Lunden, PT, Board Certified Sports Clinical Specialist, Excel Physical Therapy
15. Motto SG. "Stress fracture of the lateral process of the talus--a case report". *British Journal of Sports Medicine* 27.4 (1993): 275-276.
16. Jonathan Noble and Stephen G Royle. "Fracture of the lateral process of the talus: computed tomographic scandiagnosis". *British Journal of Sports Medicine* 26.4 (1992): 245-246.
17. Kleiger B. "Injuries of the talus and its joints". *Clinical Orthopaedics and Related Research* 121 (1976): 243-262.
18. Fjeldborg O. "Fracture of the lateral process of the talus: supination-dorsalflexion fracture". *Acta Orthopaedica Scandinavica* 39.3 (1968): 407-412.
19. Kleiger B. "Injuries of the talus and its joints". *Clinical Orthopaedics and Related Research* 121(1976): 243-262.
20. McCrory., *et al*. "Fractures of the Lateral Process of the Talus: A Clinical Review "Snowboarder's Ankle". *Clinical Journal of Sport Medicine* 6.2 (1996): 124-128.
21. James RF., *et al*. "Snow boarders Talus Fractures Experimentally Produced by Eversion and Dorsiflexion". *American Journal of Sports Medicine* 31.6 (2003): 921-928.
22. Talus HJ *et al*. "Fractures of the lateral process of the Talus".
23. Florent Bonvina., *et al*. "Imaging of fractures of the lateral process of the talus, a frequently missed diagnosis". *European Journal of Radiology* 47.1 (2003): 64-70.
24. Jukka Kettunen, *Et al*. "Fracture of the lateral talus process A case report". *Acta Orthopaedica* 63.3 (1992): 356-357.
25. Ebraheim NA., *et al*. "Evaluation of Process Fractures of the Talus Using Computed Tomography". *Journal of Orthopaedic Trauma* 8.4 (1994): 332-337.
26. TG Sanders., *et al*. "Fracture of the lateral process of the talus: appearance at MR imaging and clinical significance". *Skeletal Radiology* 28.4 (1999): 236-239.
27. Leibner., *et al*. "Fractures of the Lateral Process of the Talus in Children". *Journal of Paediatric Orthopaedics* 10.1 (2001): 68-72.

Volume 1 Issue 1 June 2015