



Trapezial Ridge Fracture – Rare But Beware!

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Abstract

Trapezial ridge fractures are rare and should be considered if pain and/or swelling of the thenar prominence and pinch weakness persist after hand trauma, especially when anteroposterior and lateral radiographs are inconspicuous. This case report describes the detection and treatment of a trapezial ridge fracture in a 52-year-old patient who suffered a fall on his outstretched hand and presented with load dependent and persistent pain of the thenar region. After diagnosis of this rare fracture type by CT-Scan and immobilization for 12 weeks fracture healing occurred and the patient was pain free in the end. Trapezial ridge fractures should be diagnosed early after trauma to avoid long-term complications as pseudarthrosis, chronic pain and impairment of pinch and grasp.

Introduction

Trapezial ridge fractures, especially when isolated, are very uncommon and mostly the result of a fall on the outstretched palm. The diagnosis is challenging and requires a precise history, physical examination and radiographic imaging [1]. Larsen et al. reported a relative incidence of 1.1% of carpal fractures excluding the scaphoid when taking all fractures into account [2]. Garcia-Elias reported on 249 carpal fractures and found an incidence of 6% for fractures of the trapezium [3]. Trapezial fractures can be classified in five patterns: vertical transarticular, dorsoradial tuberosity, horizontal, anteromedial trapezial ridge and comminuted [4]. As in scaphoid fractures or other fracture types of the carpus the initial and conventional X-ray imaging is infrequently inconspicuous. The predominant clinical signs are pain and swelling of the thenar eminence, painful resisted wrist flexion and weak or painful pinch. When persisting these symptoms should be considered and further diagnostic like CT-scan should be introduced. If the above-mentioned clinical signs are ignored and no further treatment or diagnostic is introduced missing the fracture may lead to pseudarthrosis and chronic pain [5].

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Case Presentation

We present a rare case of a type II trapezial ridge fracture in a 52-year-old, right-hand dominant male computer programmer who presented with persistent pain of the thenar region one week after falling on his outstretched hand in a bicycle accident. The clinical examination revealed a slight swelling and point tenderness of the thenar region on palpation. Power grip and wrist motion were slightly limited and the initial conventional X-ray of the wrist was normal showing no fracture signs of the carpus. Due to the persistent pain and for definite exclusion of a carpus fracture we initiated a CT- scan, which revealed a rare case of a trapezial ridge fracture (Figures 1-3). After diagnosis the wrist was immobilized for 12 weeks including the carpometaphalangeal joint of the thumb. Although avulsion fractures of the tip frequently fail to unite with immobilization the conservative treatment in this patient with a type I fracture led to an increase in bone fracture healing as revealed in a follow up CT-scan 9 weeks after trauma. To ensure further fracture healing the wrist was immobilized for further three weeks and full recovery with pain free and maximum range of wrist motion was

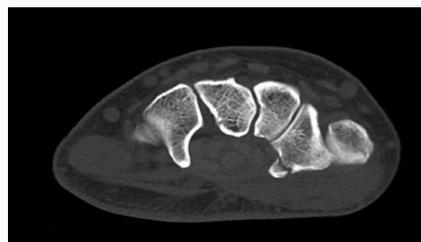


Figure 1: Axial reconstruction of the high-resolution MDCT showing the typical trapezial ridge fracture.



Figure 2: Coronal cinematic rendering of the dataset illustrating the fracture of the tubercle of the trapezium.



Figure 3: Axial cinematic rendering of the dataset illustrating the fracture showing a minimal displacement of the fracture.



Figure 4: Axial CT-scan showing fracture healing 9 weeks after trauma.

achieved after an additional three week period of therapeutic recovery (Figure 4 and 5).

Discussion

Trapezial ridge fractures are rare and amount to almost 5% of all carpal injuries [4,6,7]. As visualization on routine anteroposterior, lateral and oblique X-rays is difficult this fracture type can easily be missed and result in residual impairment of pinch and grasp. The pathomechanism is either a direct trauma to the trapezial ridge or forced distraction of the carpal arch with avulsion of the ridge by the attached transverse carpal ligament [8]. These fractures were divided by Palmer into two types. In type I the fracture is located at the base of the ridge; type II describes a fracture of the tip of the ridge [9]. As in this presented case patients present with a swelling and point tenderness at the base of the thenar eminence. Palmar flexion of the thumb against resistance is painful and routine X-rays reveal no fracture signs in most of the cases. Misdiagnosis and insufficient immobilization lead to nonunion and painful pseudarthrosis recommending a high level of suspicion and careful clinical examination to make the correct diagnosis. In the case of a questionable diagnosis especially in patients

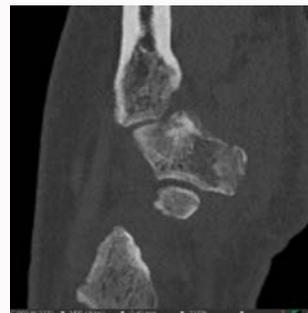


Figure 5: Sagittal CT-scan showing fracture healing 9 weeks after trauma.

who suffered a wrist injury and present with chronic thenar or wrist pain one should consider a CT scan as we performed in this case revealing a type I fracture of the trapezial ridge. This algorithm as it is recommended for detection of occult carpal fractures led to the correct diagnosis and initiation of immediate immobilization with an increase in bone fracture healing and symptom free patient 12 weeks after trauma. In cases of type II fractures with avulsion of a small tip fragment early operative excision has been suggested.

Conclusion

Trapezial ridge fractures should be considered in the case of persistent wrist pain and inconspicuous X-rays of the wrist. If misdiagnosed it can lead to pseudarthrosis with chronic pain and weakness of pinch and grasp. Hence, careful examination and precise and early diagnosis including a CT scan is warranted.

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