

Extensor pollicis longus dysfunction associated with non-united fracture of the trapezium

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Abstract A 26 year old man was referred to us with extensor pollicis longus dysfunction (EPL), and investigation revealed a fracture of the trapezium (left) and carpo-metacarpal joint dislocation of the thumb. Operative exploration revealed mechanical displacement of the tendon secondary to fracture dislocation of the trapezium as the cause for EPL dysfunction. The lesion was managed with an open reduction and screw fixation resulting in good functional outcome.

Keywords Extensor pollicis longus · fracture dislocation · trapezium

Introduction

Trapezium fractures are uncommon, and require careful clinical and radiological assessment and treatment [1]. We report a case of a displaced fracture of the trapezium presenting as a loss of extension of thumb. The clinical and radiological features are discussed. At exploration, extensor pollicis longus tendon was intact but dislodged into the fracture site causing tendon insufficiency. Although extensor pollicis longus dysfunction has previously been reported for both paediatric and adult distal radial fractures [2] we are unaware of any previous report of extensor pollicis longus dysfunction secondary to trapezium injury.

Case report

A 26 year old right handed manual labourer suffered an injury to his left hand due to a fall from a height of about 2 meters. He had swelling and pain for a week, but clinical examination was otherwise normal, and was initially treated by his GP as a sprain. He went back to work for 4 months and sustained a second injury while playing rugby. He felt his thumb was stretched and since then he could not extend his thumb at the interphalangeal joint (IPJ) (Fig. 1). He was referred for suspected EPL tendon rupture.

On examination, there was tenderness over the thenar area and functional impairment of the left thumb. He was unable to hyperextend at the IPJ with an extension deficit of 30° (Fig. 1). There was full passive extension of thumb at IPJ indicating that there was no fixed flexion deformity. Anteroposterior and oblique X-rays demonstrated fracture displacement of the trapezium. A CT showed an old fracture of the trapezium with pseudarthrosis (Fig. 2).

The non-union of trapezium was treated by an open reduction and screw fixation. At the time of exploration, it was noted that the EPL tendon was intact but was dis-

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lodged in the site of pseudarthrosis (Fig. 3). There was no actual incarceration or adhesion of the tendon, indicating that dislodgement was of recent onset probably following second injury. As a satisfactory reduction and alignment was obtained, the fracture was fixed with a single 3.0 cannulated screw (Fig. 4).

The patient was immobilized in a thumb spica for 6 wks after which wrist and hand were mobilized. The fracture healed satisfactorily both clinically and radiologically. There was minimal restriction of range of flexion/extension and abduction/adduction of the carpo-metacarpal joint of the thumb as compared to the opposite side. The patient was able to do his routine daily activities and was able to return to his job with ease. At 3 months, his thumb extension was normal.

Discussion

Fractures of the trapezium account for 3–5% of all carpal bone fractures. The combination of leverage applied to dorsum of first metacarpal and an axial load transmitted

along the shaft would result in increasing joint compressive forces on the trapezium. These fractures may be associated with other injuries, for example fractures of the base of the first metacarpal [3]. A similar mechanism of injury may explain both fractures.

A sagittal fracture with displacement of the lateral part with the metacarpal is a rare injury and been reported as case reports [3–6]. We report an unusual case of an old trapezium fracture with displacement presenting to us with inability to extend the thumb at the interphalangeal joint after a second injury to the thumb. The diagnosis was delayed and physical findings were minimal.

Plain radiographs often fail to show fractures of the trapezium because of the overlapping trapezoid. A true anteroposterior radiograph (Robert's view) taken with the hand in full pronation is excellent for outlining the trapezium and base of the first metacarpal [7, 8]. A CT scan further provides the details required for proper management by providing good multidirectional images.

Fractures of the trapezium either isolated or in combination with other injuries should not be under-estimated as they can be responsible for prolonged morbidity if



Fig. 1 Clinical dysfunction of the left EPL tendon

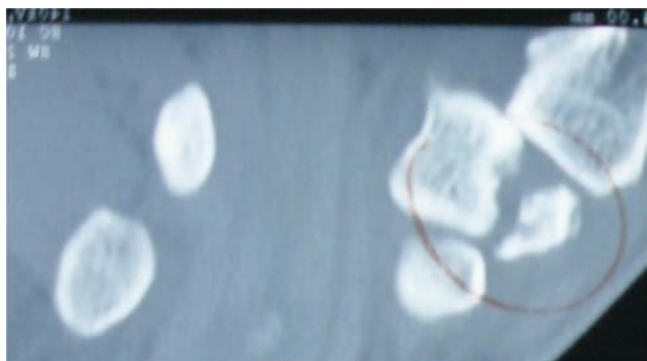


Fig. 2 CT of the left hand showing old non-union fracture of the trapezium

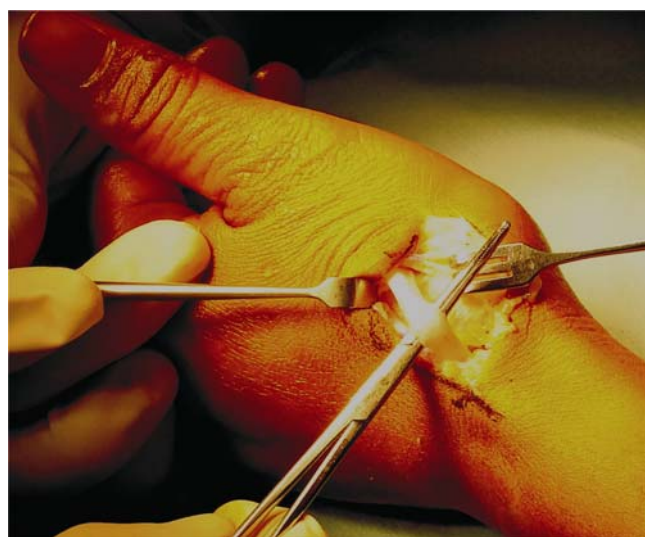


Fig. 3 Operative demonstration of integrity of left EPL tendon



Fig. 4 Post operative X-ray of the left hand after open reduction and screw fixation of the fracture of the trapezium

inadequately treated to avoid instability and late arthritic changes.

The fact that this case of trapezial fracture was only detected when the patient presented with clinical EPL dysfunction raises two interesting possibilities. Given that the tendon was revealed to be intact intra-operatively, the acute dysfunction may be explained by either entrapment within the fracture site, or by mechanical disadvantage. Tendon entrapment has been reported within various fractures sites throughout the body. Extensor pollicis longus entrapment has been reported in conjunction with distal radial fractures (see [2]), either occurring at the time of injury or as a consequence of closed reduction, but has not previously been described in the context of trapezium fractures. An alternative explanation relates to the complex biomechanics of the thumb extensor mechanism such that EPL was unable to function efficiently following exacerbation of fracture displacement at the time of the second (rugby) injury.

This case is unique in the sense that our patient had two injuries and clinical findings did not correlate with intra-operative findings. It is clear from plain radiographs and CT that fracture dislocation happened during the first injury. EPL displaced at the site of non-union following the second injury causing inefficiency of EPL. This was further confirmed at surgical exploration as there was no adhesion of the tendon. The patient's pre-operative assessment indicated that he had an attritional tear of

tendon but at exploration the tendon appeared normal (Fig. 3).

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