

Acute pure Trapezio-metacarpal joint dislocation: A rare case report and literature review

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Abstract

Pure dislocation of the trapezio-metacarpal joint is a rare lesion, The mechanism is generally indirect, Untreated or inadequately treated, they are the cause of instability in this joint, which inevitably leads to rhizarthrosis

we report a case of a 30-year-old male presented at the emergency department for a right pure trapezio-metacarpal joint one hour after injuring his right thumb in a motorbike accident. In the operating theatre the trapezio-metacarpal dislocation was first reduced using an external manoeuvre and then fixed using an ISELIN-type intermetacarpal pin. At the last post-operative follow-up at 14 months the patient had a good functional outcome compared to the other hand.

Keywords: Thumb; Dislocation; Trapezio-metacarpal joint; ISELIN technique; Surgical approach

1. Introduction

Pure trapezio-metacarpal joint (TMJ) dislocation is a rare hand injury [1], since it represents only 1% of hand injuries [2].

Rivington described the first case in 1873 [3], the mechanism is generally indirect, involving axial compression and retropulsion (Kindle theory) or shear (Monsche theory) [2].

Untreated or inadequately treated, they are the cause of instability in this joint, which inevitably leads to rhizarthrosis [4]. Stabilisation is essential because orthopaedic treatment is always unsuccessful [5].

The most effective treatment approach for traumatic Trapezio-metacarpal dislocation remains to be a topic of controversy [6]. Open or closed reduction with temporary K-wire fixation, dorsal capsule and ligament reconstruction, and closed reduction and cast have all been deployed to stabilize the joint [7].

We report the case of a 30-year-old patient who was the victim of a motorbike accident resulting in pure closed trapezio-metacarpal dislocation. He underwent closed reduction in the operating theatre with temporary fixation by pinning using the ISELIN-type intermetacarpal pin with a good functional outcome at 14-months follow-up.

2. Case presentation

A 30-year-old male presented at the emergency department one hour after injuring his right thumb in a motorbike accident. The patient experienced severe pain in the thumb and was unable to mobilize his right thumb. On inspection,

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there was a noticeable malformation, swelling, and sensitivity observed at the anatomical snuffbox. The patient was conscious with no other point of impact.

The patient received a radiographic examination showing a pure dorsal trapezometacarpal dislocation without an associated fracture. (Fig 1).

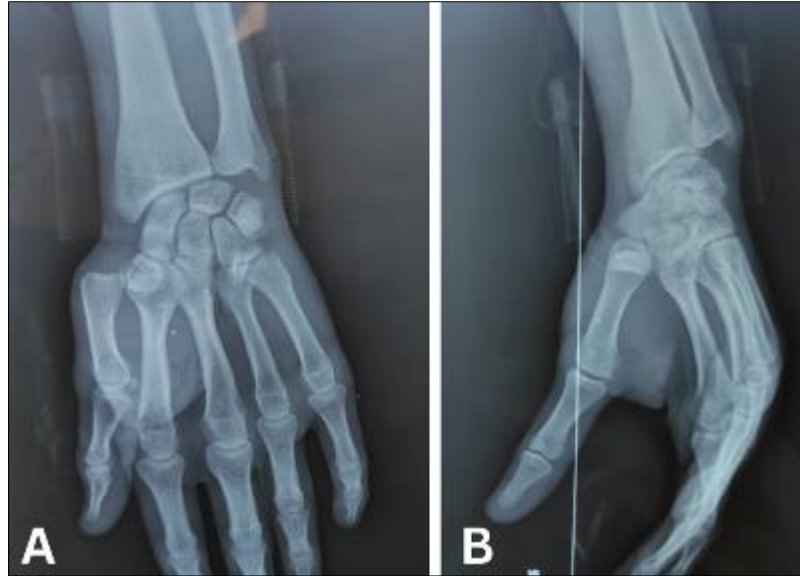


Figure 1 (A+B) Preoperative radiographs showing a pure dorsale trapezio-metacarpal joint dislocation

In the operating theatre, with the patient supine on an arm table, under general anaesthesia, the trapezio-metacarpal dislocation was first reduced using an external manoeuvre, and the reduction was instable on testing. Stabilization was then performed using an ISELIN-type intermetacarpal pin (fig 2); pinning distal from second metacarpal (M2) to the first metacarpal (M1) then proximal from M1 to M2. We did not proceed with the approach of the joint. The articulation was stable intraoperatively, and a thumb spica plint is then applied.



Figure 2 Post-operative radiographs showing a good reduction of the trapeziometacarpal joint

At 6 weeks postoperative, the patient had the 2 K-wires removed, and rehabilitation was started consisting of recovery of joint amplitude and strengthening of the thenar compartment muscles.

At 6 months post-operatively, the patient reported pain and discomfort during leisure activities and daily life, which did not lead to occupational reclassification. X-rays showed a reduced joint with no signs of osteoarthritis (Fig 3).

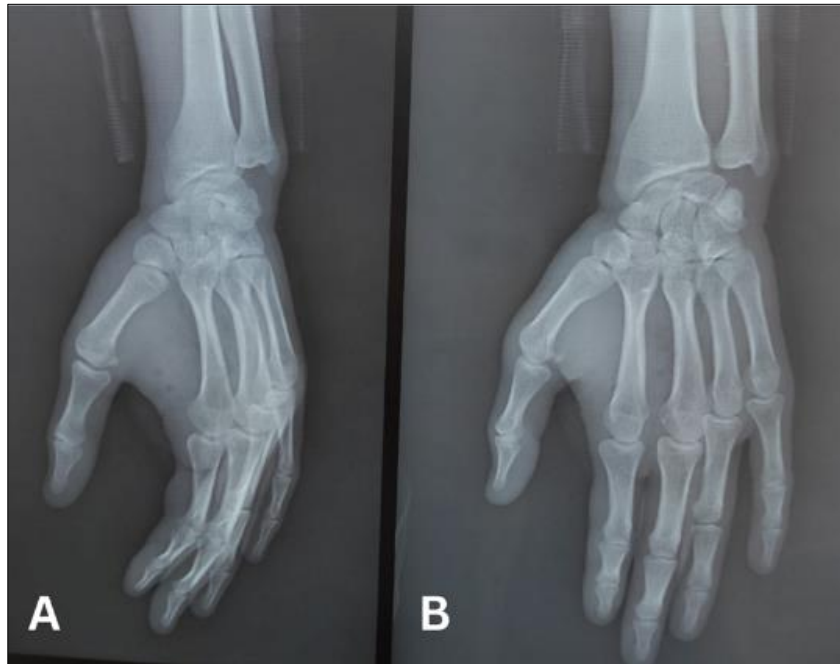


Figure 3 (A+B) Radiograph 6 months postoperatively

At the last post-operative follow-up at 14 months, the recovery of the overall function of the thumb spine was compared with the healthy side by measuring thumb joint amplitudes and by measuring the spread angle, which was 42°. Measurement of pollicidigital forceps and wrist strength was identical to the healthy side, and the joint was stable.

3. Discussion

Pure trapezio-metacarpal dislocation is the rare form of injury at thumb [7]. The trapezio-metacarpal joint is a very stable joint [2]. The anterior oblique ligament, dorsoradial ligament, posterior oblique ligament, and intermetacarpal ligaments are the four ligamentous structures who stabilize it [1]. Pagalidis et al. in 1981 demonstrated that the posterior oblique ligament and intermetacarpal ligaments were the most significant contributors to joint stability [8].

Many authors have emphasized the extreme violence required to disrupt the joint socket. This makes TMJ dislocation of the thumb a rare injury [5].

The usual mechanism of injury has been described as axial loading and flexion of the thumb metacarpal [9].

Most trapezio-metacarpal dislocations are dorsal and are thought to occur through axial loading of a partially flexed thumb. Volar dislocations are rare [7].

This injury can be missed on initial evaluation. The dislocation will often be reduced before being seen by the surgeon. The clinical diagnosis is thereafter established by identifying the remaining instability [7].

The diagnosis is usually made using conventional radiography of the hand. Applying abduction stress to the thumb can enhance the sensitivity of the exam. It is crucial to pay close attention to minor dislocation or subluxation, since they are frequently missed and can result in delayed diagnosis and persistent instability [10]. In addition, some reviews of the literature recommend an additional CT scan in cases of fracture of the base of the first metacarpal [2].

For the management of resected lesions, there is no clear consensus for the choice of treatment given the limited number of cases in the literature. For acute lesions, Watt and Hooper published an algorithm in 1987 based on TM joint stability after closed reduction: if the reduction is stable, retention with a gauntlet for 6 weeks would be sufficient. If the reduction is unstable, pinning (Wiggins or Iselin [11]) may be added to maintain joint congruence [2].

For other authors, the risk of secondary instability justifies approaching the joint with early reconstruction by ligamentoplasty [12–14].

Simonian et al. conducted in a comparative study on 13 patients to evaluate the outcomes of pinning versus open ligamentous repair. The pinning group exhibited more instability, while the ligamentous restoration group showed a higher prevalence of osteoarthritis [14].

Various complications have been reported in studies, such as persistent residual pain in the hand, reduced grip strength, subluxations, secondary displacements and rhizarthrosis [15].

4. Conclusion

Trapeziometacarpal dislocations are rare but should not go unnoticed, as they can develop into rhizarthrosis. Reduction is usually easily achieved but there is still debate over the choice of fixation. The ISELIN technique, which is easy to perform, allows this type of lesion to be treated with good functional results. Reconstruction is necessary if the dislocation is neglected, chronic or if reduction is imperfect. Some authors suggest acute capsulo-ligament repair for young athletes who use their upper limbs a lot.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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