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Clinical case

Recurrent posttraumatic trapeziometacarpal joint dislocation in a child: A case report

Luxation trapézo-métacarpienne récidivante post-traumatique chez l'enfant : à propos d'un cas

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Abstract

Traumatic trapeziometacarpal joint dislocation of the thumb accounts for less than 1% of all hand injuries. This injury is even less common in children. Optimal treatment strategies for this injury are still the subject of debate for both children and adults. We report a case of recurrent posttraumatic trapeziometacarpal joint dislocation in an eight-year-old girl. We believe our case is the first report of recurrent acute dislocation leading to chronic dislocation in the English medical literature. Restoring the anatomy and biomechanics of the trapeziometacarpal joint is essential when treating these injuries; for this reason, surgical treatment is usually indicated. Overall, the prognosis of trapeziometacarpal dislocation treated acutely is favorable and stable over time. However, the role of open surgery and ligament reconstruction remains controversial, especially in children.

Keywords: Trapeziometacarpal joint; Dislocation; Thumb; Instability; Child

Résumé

La luxation de l'articulation trapézo-métacarpienne compte pour moins de 1 % des traumatismes de la main. Cette lésion est encore plus rarement observée chez les enfants. Le traitement optimal de ce traumatisme reste controversé chez l'enfant, comme chez l'adulte. Cet article rapporte le cas d'une luxation récidivante de l'articulation trapézo-métacarpienne chez une enfant de 9 ans. Au regard de la littérature, il semblerait que cela soit le premier cas de luxation récidivante, conduisant à une instabilité chronique. Restaurer l'anatomie et la biomécanique de l'articulation trapézo-métacarpienne est essentiel lors de la prise en charge de ces traumatismes, et c'est la raison pour laquelle le traitement chirurgical est indiqué. Les luxations trapézo-métacarpiennes prises en charge précocement sont généralement de bon pronostic, avec une évolution stable au fil du temps. Le rôle de la ligamentoplastie reste controversé, particulièrement chez l'enfant.

Mots clés : Articulation trapézo-métacarpienne ; Luxation ; Pouce ; Instabilité ; Enfant

1. Introduction

Isolated traumatic dislocation of the thumb carpometacarpal joint, also called the trapeziometacarpal (TMC) joint, is a rare injury that accounts for less than 1% of all hand injuries [1]. Acute TMC dislocation and TMC instability are even less common in children. McLaughlin and Abouzhar were the first to report TMC dislocation in a child [2]. Varitimidis and Sotereanos

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described performing volar oblique ligament reconstruction for carpometacarpal joint dislocation in an 11-year-old [3], while Rashdeen et al. presented the first case of a child with simultaneous dislocation of the metacarpophalangeal joint and subluxation of the thumb carpometacarpal joint [4].

The anatomy and physiopathology of the TMC joint have been studied extensively. Similar to two opposing saddles with perpendicular transverse axes, the stability of the TMC joint in power pinch and power grasp motions depends on the TMC joint's two prime stabilizers—the volar beak of the thumb metacarpal and the dorsal radial ligament complex [5]. According to Bettinger et al. [6], there are at least 16 ligaments around TMC joint with the four most important ones being the volar (anterior oblique), intermetacarpal, dorsal radial, and dorsal oblique (posterior oblique) ligaments [5,6]. In the final phase of thumb opposition, screw-home torque rotation of the volar beak of the thumb metacarpal in the pivot area of the trapezium recess and tension on the dorsal ligament complex create stability during power pinch and power grip motions [5].

It is generally admitted that the mechanism of acute TMC joint dislocation is axial compression on a flexed thumb metacarpal, driving the metacarpal base out dorsally. But a second force is driven into the first web space of the thumb, which separates the base of the first and second metacarpal joints and produces a TMC joint dislocation as for cycle drivers. Mechanical instability of the thumb TMC joint is an important factor that may lead to osteoarthritis. The complex ligamentous system is the reason why there is no single good surgical technique for ligament reconstruction, but several satisfactory alternatives.

Our case highlights the limitations of conservative treatment for recurrent TMC joint dislocation. Furthermore, this case illustrates the need for open reduction after failure of conservative treatment, even in cases of early failure. Finally, it underlines the need for ligament repair to prevent late recurrence of TMC dislocation or chronic instability.

2. Case report

An eight-year-old, left-hand-dominant girl consulted at our center for recurrent dislocation of her left thumb. She presented no signs of hyperlaxity. She had no family history of laxity or trapezium dysplasia. Her contralateral TMC joint was stable and painless. Eight months before, she fell from her bed and suffered an acute TMC dislocation of her left hand (Fig. 1). She was treated at another center. The dislocation was reduced and immobilized in a gauntlet cast. Fifteen days later, X-rays showed joint subluxation (Fig. 2), which was treated surgically with closed reduction and intermetacarpal pinning. Stabilization was achieved with a single intermetacarpal K-wire (Fig. 3). Six weeks later, the pins were removed and the TMC joint seemed to be reduced on X-rays (Fig. 4). She felt no pain. Four months later, after falling again on her left hand, she sustained a second TMC dislocation (Fig. 5). New X-rays showed that the TMC joint was reduced in the cast after closed reduction (Fig. 6). But after cast removal, she continued to be in pain and complained of thumb instability. Her parents decided to consult at our center. She presented a palpable volar deformity at the base of the left thumb associated with recurrent TMC joint dislocation. Pain was elicited upon palpation around TMC joint and thumb opposition was painful and clumsy. Opposition score according to Kapandji was 8/10, whereas the retroposition score was 3/4. Clinical testing revealed a Tillaux's sign corresponding to a piano key with "dinner fork" type deformity. The diagnosis was confirmed on Kapandji views including true AP and lateral views of the TMC joint [7]. Magnetic resonance imaging (MRI) showed posterolateral ligament complex damage and no growth plate injury (Fig. 7).

We decided to perform open reduction and internal stabilization of the TMC joint using the Eaton–Littler surgical

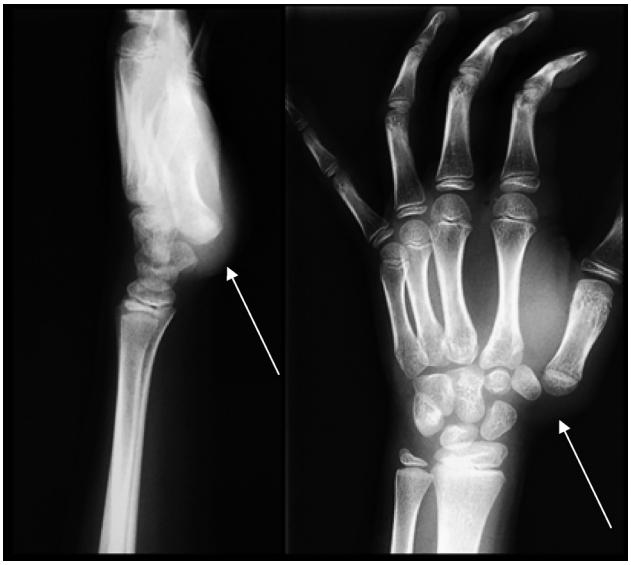

Fig. 1. Lateral and AP radiographs showing the first TMC joint dislocation (arrows).

Fig. 2. Lateral and AP radiographs showing secondary displacement of the TMC joint after 15 days of gauntlet immobilization. The TMC joint is dislocated again (arrows).