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Floating thumb with double dislocation of carpometacarpal and metacarpo-phalangeal joints

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ABSTRACT

INTRODUCTION: Double dislocations of carpometacarpal and metacarpo-phanlageal joints are rare. We report an unusual case of simultaneous dislocation of both CMC and MCP joints in the thumb.
PRESENTATION OF CASE: A 31 year old male was admitted following a road traffic accident. He was complaining of pain and deformity of right thumb. The X-ray examination revealed simultaneous dislocation of both CMC and MCP joints. He underwent closed manipulative reduction and percutaneous K wire fixation. The wires were removed after six weeks. After a course of physiotherapy he regained full range of pain free movements.
DISCUSSION: The incidence of simultaneous dislocation of both CMC and MCP joints in thumb are associated with high energy injuries. The options of treatment are conservative with cast immobilisation and serial X-rays or operative including closed manipulative reduction and K wire fixation or open reduction and internal fixation.
CONCLUSION: The option of treating this rare injury with closed manipulative reduction and percutaneous K wiring gives excellent and predictable results.

1. Introduction

Simultaneous dislocation of the thumb carpo-metacarpal joint (CMC) and metacarpo-phanlangeal (MCP) joint is a rare injury.[1,2] The terms used to describe these unusual injuries are double dislocation, complete dislocation and floating thumb metacarpal in the past.[2–4] There are reports of fracture dislocation of the CMC joint and MCP joints in the literature.[5] The treatment for these uncommon injuries varies from closed manipulative reduction and casting, percutaneous K wiring and open repair of the ligaments.[2,6] We report a rare simultaneous dislocation of thumb metacarpal treated with closed manipulative reduction, percutaneous wiring and cast immobilisation with excellent results.

2. Case report

A 31 year old man was admitted in our unit after sustaining a road traffic accident when his right hand got caught between his body and front seat. He is right hand dominant and works as an architect. He was complaining of pain, deformity and inability to move his right thumb.

On examination there was a visible dislocation of both CMC and MCP joints of first metacarpal. It was a closed and there was no neurovascular deficit. There was tenderness in both CMC and MCP joints and active movements of these joints were painfully restricted. The X-ray examination revealed a double dislocation of the first metacarpal of both CMC and MCP joints (Fig. 1).

2.1. Operative technique

Under general anaesthesia and image intensifier the hand is screened for other fractures and dislocations of carpal and metacarpal bones. The diagnosis was confirmed as pure double dislocation of the thumb metacarpal. The first carpo-metacarpal joint is manipulated in to the joint and stabilised with a single 1.6 mm K wire passing from the metacarpal into the Trapezium bone. The first metacarpo-phalangeal joint is manipulated in to joint and fixed with a single 1.6 mm K wire across the joint. The stability of both the joints is checked under image intensifier (Fig. 2). Post operatively the hand was kept elevated and immobilised in a thumb spica cast. The hand was inspected after one week for any pin track infection and plaster immobilisation continued for six weeks in total.

After six weeks the patient was seen in the fracture clinic and the K wires were removed under local anaesthesia. The check x-rays showed the joints well reduced (Fig. 3). The patient was then send for hand physiotherapy. He was assessed again in the clinic at the end of three months to check the thumb movements and

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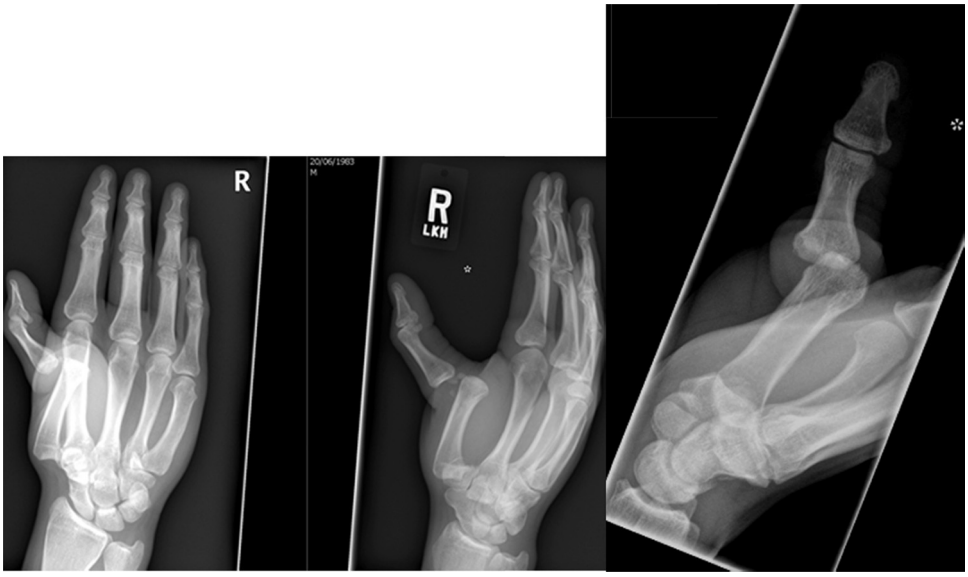

Fig. 1. Double dislocation of the thumb of CMC and MCP joints.

Table 1
Comparative range of motion for CMC and MCP joints of the thumb.

Range of motion			
		Right	Left
Thumb CMC joints	Palmar adduction/abduction	Contact/43	Contact/45
	Radial adduction/abduction	Contact/60	Contact/60
Thumb MCP joints	Extension	10	10
	Flexion	50	55

Table 2
Comparative pinch strength.

Pinch strength (lbs)		
	Right	Left
Tip	16	19
Lateral	19	24
Palmar	22	24

stability of joints. The patient regained full pain free movements of the thumb. A Quick-DASH score at the end of three months was 21. The patient was pleased with the outcome of treatment and returned back to his job. He was reviewed back in the clinic after 18 months of injury. He demonstrated good functional and pain free range of movements of both CMC and MCP joints (Table 1). The tip, lateral and palmar pinch strength was measured for both right and left sides using a pinch metre gauge which showed good pinch strength compared to the left side (Table 2).

3. Discussion

Concurrent dislocation of the CMC and MCP joints of the thumb are rare.[7,8] Double dislocation of the thumb can be at IP and MCP joints,[9,10] MCP and CMC joints,[2,4,11] or IP and CMC joints.[8] The mechanism of CMC joint dislocation is a longitudinal directed force along the flexed MCP joint. The MCP joint dislocation is due to a hyperextension injury.[12] The combination of longitudinal force along the metacarpal bone causing the MCP to hyperextend may

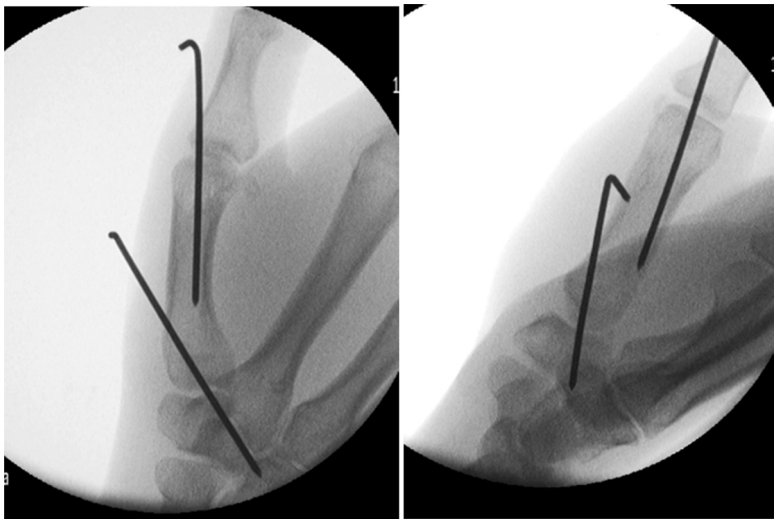

Fig. 2. Closed reduction and K wiring of CMC and MCP joint dislocation.

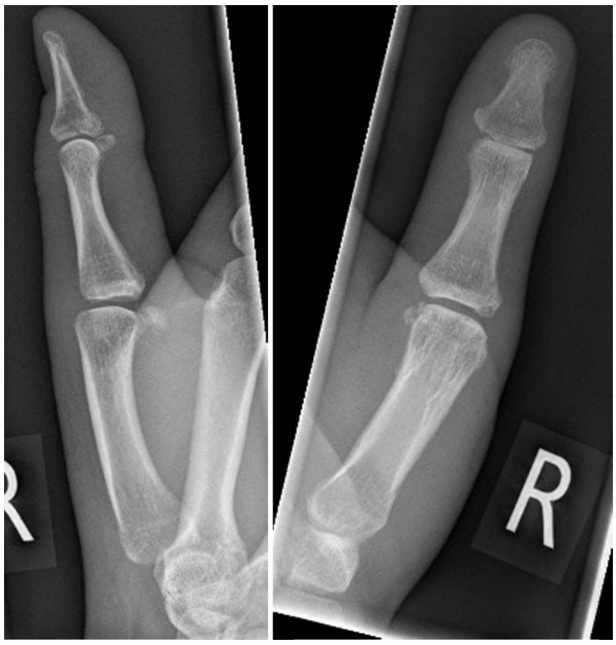

Fig. 3. Check X-rays after six weeks showing both CMC and MCP joints well reduced and congruent.

be the mechanism of injury in our case also when the thumb was caught between the body and front seat.

Van Ransbeek had reported a large case series of upper limb digits dislocation. In their series there was only one case of thumb dislocation.[13] This study illustrates the fact that these are extremely rare injuries.

Wee et al. have reported a case of missed double dislocation of the thumb.[8] In a polytrauma situation these unusual injuries can be overlooked as the main attention will be directed towards damage control procedures to stabilise the life and limb threatening injuries. A detailed secondary and tertiary survey of such patients should be done to diagnose such rare and unusual injuries.

There is a high incidence of presence of collateral injuries to the MCP joints in double dislocations. Sakuma et al. have reported a case where they have do a secondary operative intervention because of persisting volar subluxation of the MCP joints of little finger after the first procedure to stabilise the double dislocation in the digit.[14] They found both radial and ulnar collateral ligaments were torn and the radial collateral ligament was interposed in the articular surface of the MCP joint.

The timing of operative intervention of these injuries has also been debated. Khan et al. in their case report have described that delay up to four weeks is acceptable.[15] The patient still went on to have a good functional recovery.

The role of Eaton's ligament reconstruction using the flexor carpi radialis tendon in acute dislocations has also been reported.[16,17] This method of treatment is especially useful in dislocations associated with non-repairable ligamentous injuries.

There is a role of non-operative management of these injuries. Marcotte et al. described closed reduction and cast immobilisation of a double dislocation of the thumb with satisfactory and good range of thumb movements.[18] These injuries if treated in plaster cast has to reviewed weekly for check radiographs.[15] Mudgal et al. also described closed manipulative reduction of these injuries with a follow up of 18 months with good outcomes.[20]

The duration of follow up of these injuries varies. Moore et al. followed up these patients for 9 years and showed no arthritic changes or instability.[3] Gerard et al. reported degenerative features in the CMC and MCP joints after double dislocation of the thumb.[19]

4. Conclusion

Simultaneous dislocation of CMC and MCP joints of the thumb are rare injuries with only a few cases reported in the literature. They are usually associated with high velocity injuries. High index of suspicion with adequate clinical examination and careful interpretation of radiographs are needed in the diagnosis of this injury. Even though both non-operative and operative treatments options are advised we recommend closed manipulative reduction with percutaneous K wiring. Both CMC and MCP joints should be checked for ligamentous instabilities.

Conflict of interest

There is no conflict of interest in relation to this article.

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Ethical approval

Ethical approval has been got from the hospital trust.

Author contribution

Aysha Rajeev has contributed to study concept, design, data collection, data analysis and writing of the paper. Soliman Nouredin has contributed in the preparation of case report. David Graham contributed towards the management and follow up of the patient.

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