

Dislocation of the First Carpometacarpal Joint

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Abstract

First carpometacarpal (CMC1) joint dislocations are uncommon injuries. However, they can limit hand functions and lead to serious complications. Herein, we report the case of a multiple trauma man with dorsal dislocation of thumb CMC joint that was successfully treated with closed reduction and casting. The patient was a 47-year-old male with multiple traumas complaining of right wrist pain. Tenderness, deformity, and reduced range of motion of the right thumb CMC joint were observed. X-ray showed dorsal dislocation of the CMC1 joint. Closed reduction of the dislocated joint was performed under general anesthesia, and the joint was immobilized by a thumb-spica cast for 14 days. The patient was eventually discharged in good condition and had no complications or manual dysfunction after a 1-month follow-up. The optimal management of the CMC1 joint dislocations is controversial. The closed reduction seems adequate for these injuries. However, patients whose joints remain unstable after closed reduction, especially those with manual activities, should be considered for open reduction and surgical ligament repair.

Keywords: Carpometacarpal joint, dislocation, thumb

INTRODUCTION

The first carpometacarpal (CMC1) joint, also known as the trapeziometacarpal joint or the thumb CMC joint, is a unique saddle-shaped joint that gives the thumb a multidirectional range of motion to offer major and proper functions of the hand including pinch, grip, and grasp.^[1]

Accounting for about 1% of all hand injuries, isolated dislocation of the CMC1 joint is an uncommon injury with the greatest being dorsal. The typical mechanism for such injuries is axial loading while the thumb is flexed. Such dislocations predispose the joint to degenerative joint disease. Therefore, proper management of these injuries is of cardinal importance to decrease the complications and give proper mobility and stability of the joint.^[1-3]

Due to its rare occurrence, there is still controversy on the optimal strategy for the treatment of CMC1 joint dislocation. Closed reduction and casting or open/closed reduction and fixation with Kirschner wires and ligament reconstruction have been recommended.^[1-4]

CASE REPORT

We present a 47-year-old male had a car accident while he was pedestrian. He was brought to the Emergency Department of Shaheed Hasheminejad University Hospital by emergency medical services. On admission, the patient was completely conscious and had a Glasgow coma scale of 15. He had complained pain on the base of the right thumb and reduced range of motion in his right thumb.

His vital signs were as follows: blood pressure 110/70 mmHg, pulse rate 70 beats/min, respiratory rate: 15/min, and O₂ saturation in the air room 97%.

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The primary and secondary survey was completely done; finally, the positive point was deformity and tenderness on the base of CMC1 joint that completely reduced the range of motion [Figure 1].

Neurovascular examination of the right hand was normal.

However, oblique and anteroposterior X-ray of the right hand showed dorsal dislocation of the CMC1 joint [Figure 2]. For further evaluation, he underwent computed tomography scanning which confirmed dislocation [Figure 3].

For further therapeutic ways, the patient was transferred to the orthopedic department. He had a close reduction under general anesthesia in the operating room. The joint was fixed for 14 days, using a thumb-spica cast. Postoperative X-ray showed an anatomic reduction of the joint [Figure 4].

The patient was eventually discharged with short-arm cast and advised to come back for evaluation 14 days later. After 14 days, he returned to remove the cast. His hand was completely functional, with no deformity or neurovascular

problem. He reported no complications and had no problem in his manual functions after a 1- month follow-up.

DISCUSSION

A hypermobile trapeziometacarpal joint can lead to serious complications, one of a clinically significant pain that can gradually grow intractable. Hypermobility of this joint can be either idiopathic, which is not that rare, or traumatic that is usually a result of dislocation, which is relatively rare.^[1,2]

Traumatic dislocation of the CMC1 joint is reported to be associated with various damages to ligaments and joint capsule, all of which result in joint instability and predisposes the dislocated joint to degenerative joint disease. Therefore, proper and timely management of these injuries is vital for reaching to a stable, painless, and functional joint.^[1,2]

In this case, closed reduction was performed under general anesthesia a few hours after the trauma, and the CMC joint



Figure 1: Patients hand before reduction, obvious deformity of the first carpometacarpal joint



Figure 2: Anteroposterior (a) and oblique (b) X-ray of the right hand showing dorsal dislocation of the first carpometacarpal joint



Figure 3: Coronal computed tomography scanning of the hand confirmed dislocation



Figure 4: Postoperative X-ray showing anatomic reduction of the joint

was immobilized by casting for 14 days. We reduced the immobilization time to minimize muscular atrophy and loss of function. The joint was stable and functional on follow-up, and we observed a favorable outcome.

Consistent with our case, there are several reports of patients with thumb CMC joint dislocation who were treated by closed reduction and casting and showed a favorable outcome.^[5] This method can be the definitive treatment when the joint remains stable after reduction. In accordance with our case, Bosmans *et al.* obtained favorable outcomes in two patients with the same injury treated by closed reduction and casting.^[1] In addition, Khan *et al.* reported good functional results in a patient with bilateral CMC1 joint dislocation that was treated by closed reduction and casting.^[4] Acceptable outcomes after 9 months were also reported by Kural *et al.*, who treated the same injury through closed reduction and casting.^[7] Aydin reported good functional and anatomic results after closed reduction and immobilization of a volar dislocation of thumb CMC joint.^[8]

Watt and Hooper treated 12 patients with CMC1 dislocation by closed reduction and casting with or without K-wire fixation. They also reported favorable outcomes for closed reduction. However, the outcomes were satisfied in patients who underwent pinning with K-wires as well as closed reduction and casting.^[9] In contrast, Jakobsen and Elberg reported slight instability in patients treated with closed reduction and percutaneous K-wire fixation.^[10]

Moreover, Simonian and Trumble compared early ligament reconstruction with closed reduction and K-wire fixation in dorsal thumb CMC dislocations. They indicated that ligament reconstruction showed better clinical and functional outcomes.^[11] Favorable outcome after surgical ligament repair was also reported in several other studies.^[12,13] However, Schoenaers *et al.* reported low patient satisfaction rates with reconstruction method after 7 years of follow-up.^[14]

CONCLUSION

There is an ongoing debate over the optimal management of the CMC1 joint dislocations, but there is no doubt that early and anatomic reduction is essential to keep proper joint function, maintain stability, prevent recurrent dislocations and degenerative changes, and reach a painless joint. There is commensurate evidence on the adequacy of closed reduction for acute dislocations of thumb CMC joint. However, patients whose joints remain unstable even after closed reduction, especially those highly engaged in manual activities, should probably be considered for open reduction and surgical ligament repair.

Acknowledgment

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Ethical approval

This is a case report of the first CMC joint dislocation, the informed consent was given from the patient.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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