CASE REPORT

Isolated slipping dislocation in the ulnar direction of the fifth carpometacarpal joint—The utility of computed tomography

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Introduction

An isolated dislocation of the carpometacarpal (CMC) joint of the fifth finger is a relatively rare injury. In this type of injury, the dislocation may occur in a dorsal or volar direction. However, there are extremely few reports of a dislocation in the ulnar direction [16]. We experienced a case, which presented with the isolated ulnar side dislocation of the fifth CMC joint and demonstrated a slipping of the fifth metacarpal bone on the arc of the transverse palmer arch.

We present a case of an ulnar-sided CMC dislocation of the fifth finger which was overlooked on the initial evaluation and ultimately diagnosed with a computed tomography (CT) scan.

Case report

A 22-year-old male presented in the emergency department following an injury on his left hand. There was an excoriation to the volar aspect of the fifth metacarpophalangeal (MCP) joint with associated swelling, but only slight swelling was observed around the CMC joint. The emergency room physician consulted a clinical fellow in orthopaedics. Retrospectively, a dislocation of the fifth CMC joint was clear on the X-rays (Fig. 1a and b); however, the fellow did not notice the dislocation and sent the patient home with a splint. When the patient returned to the hospital 9 days later, the swelling of the MCP joint had extended to the CMC joint of his little finger and he complained of intense pain associated with gripping. He appeared to have an isolated CMC joint dislocation of the fifth finger after clinical and radiographic re-examination. To further clarify the dislocation direction, the patient was evaluated by CT. A three-dimensional CT evaluation showed fifth metacarpal bone dislocation in the ulnar side, as if the metacarpal bone had been slipped along the transverse arch of the hand (Fig. 2a and b). An open reduction and internal fixation was performed using two Kirschner wires (Fig. 3). The wires were removed 10 weeks after the procedure. At the last physical examination 7 months after surgery, the patients had recovered the full range of motion of the left fingers, and the grasping power was 50 kg on the right hand, and 45 kg on the left hand.

Discussion

A dislocation of the fifth CMC joint with no associated fracture is a relatively uncommon injury. This isolated type of fifth CMC dislocation has been reported to occur in a dorsal or volar direction [1,2,5,10,11,17–19], which may be easily overlooked under routine radiographs of an injured hand [7,15]. An isolated fifth CMC dislocation in the ulnar direction, as reported in the present case, is further uncommon and has not been well recognized [16]. The ulnar side dislocation of the fifth CMC joint apparently occurred without disturbing the arc of the transverse arch of the hand. Thus,
the initial clinical diagnosis can be difficult for the CMC dislocation in the ulnar direction.

The postoperative results were excellent in the present case, although the diagnosis and treatment were delayed. However, it is important to distinguish fifth CMC dislocation among more commonly observed sprains of MCP and CMC joint, since the delayed treatment for the dislocation may lead to decreased range of movement and a poor grip [12,14].

It is also necessary in patients with a fourth metacarpal shaft fracture to examine a possible association of the occult fifth CMC joint dislocation [3].

For the correct diagnosis, appropriate radiographic examination is of utmost importance. The ‘true’ lateral radiograph of the hand was recommended in the past articles [4,7] and Parkinson and Paton suggested that the angle change between the long axis of the second and fifth metacarpal
bones should be evaluated in order to elucidate the CMC dislocation [13]. In addition, Hodgson and Shewring suggested to examine the lines superimposed on the central longitudinal axis of the second to fifth metacarpal bones [8]. These lines (metacarpal cascade lines) normally converge to one point of the distal radius using the posterior–anterior X-rays, whereas the line alignment is disturbed in CMC dislocation. Fisher et al. proposed the use of ‘parallel M lines’ of zigzag CMC joint line for diagnostic reference [6]. Yamakado et al. described the usefulness of stress X-rays [19]. Thus, there is no single modality, which can definitively applicable to diagnose dislocation of the CMC joint. It is, therefore, important to suspect this type of dislocation and to confirm the diagnosis by observing X-rays from various direction and viewpoints. A three-dimensional CT evaluation, as demonstrated in the present case, should not only help to detect the presence of fifth CMC dislocation but enable to determine the direction and the type of dislocation.

In addition to radiographic diagnosis, Iqbal and Saleemi suggested ‘Indian Salutation test’, which is conducted by putting both hands together and comparing finger length [9]. In the present case, however, the injury was not recognized by this method (Fig. 4). This method could therefore be useful in cases with volar or dorsal side dislocation, but may not be applicable to a case with ulnar side dislocation and preserved transverse palmar arch.

Conclusion

The isolated CMC joint dislocation of the fifth finger is rare injury and might be overlooked even by orthopaedist. For the diagnosis, it is important to take into consideration and also to use various supporting diagnostic methods. CT analysis is very useful for the correct diagnosis and to determine the type of dislocation, especially for the CMC joint dislocation in the ulnar direction.

References