



Isolated complex dislocation of the metacarpophalangeal joint of the third finger

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Two unusual cases of isolated closed complex dislocation of the metacarpophalangeal joint of the third finger are presented. The single most important element preventing reduction was interposition of the volar plate between the proximal end of the phalanx and the head of the metacarpal, but the deep transverse ligament was also intimately involved in the entrapment mechanism. Such dislocations require open reduction as in the two cases presented, and we found the dorsal approach to be simple and effective.

INTRODUCTION

Isolated closed dorsal dislocation of the metacarpophalangeal (MCP) joint of the third finger is a rare injury. Closed reduction is usually impossible (1). Two cases are reported, and the anatomical lesions and the operative technique are discussed.

CASE REPORTS

Case 1

A 24-year old man was examined at a local hospital ten hours after sustaining a hyperextension injury to his left third finger while playing volleyball. He complained of pain, swelling and limitation of active motion at the metacarpophalangeal joint. Radiographs showed dorsal dislocation of that joint (fig 1). After an attempt at closed reduction under general anaesthesia, cast immobilisation was applied for four weeks. The patient was transferred to our hospital seven months later ; he complained of persistent deformity, pain and limitation

of motion. Radiographs showed persistent dislocation and irregularity of the articular surfaces. A dorsal approach, as described by Becton *et al* (in 2) was performed. At exploration, the fibro-cartilaginous volar plate was found interposed between the metacarpal head and the base of the phalanx and its connexions to the deep transverse metacarpal ligament were intact, the flexor tendons and lumbrical muscle were displaced dorsally and medially. Reduction was achieved after incision of the bilateral attachments of the volar plate to the deep transverse ligament. Two and a half years after operation, the range of motion of the MP joint was 75°.

Case 2

A 42-year-old man injured his left third finger during a fall on his outstretched right hand. Soon after injury, he was taken to a local hospital where a diagnosis of closed, dorsal dislocation of the MP joint of the third finger was made. An attempt was made to reduce the dislocation by closed manipulation under general anaesthesia, and immobilisation

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Fig. 1. — Persisting isolated complex dislocation of the MCP joint of the third finger, seven months after an unsuccessful attempt at reduction (AP and lateral view) (case 1).



Fig. 2. — Persisting complex dislocation of the MCP joint of the third finger, one and a half year after injury (case 2).

in a cast was performed for four weeks. The patient consulted in our department one and a half year later. Clinical examination suggested persistent dorsal dislocation of the MCP joint of the middle finger; this was confirmed by radiography (fig 2). Surgical exploration through a dorsal approach discovered scarred soft tissue incarcerated in the joint and dorsomedial displacement of the flexor tendon and lumbrical muscle. After releasing the deep transverse ligament and the ulnar collateral ligament, and removing the interposed tissue, the MCP joint was reduced; however, as the articular surfaces were markedly abraded and the flexor tendon and lumbrical muscle were atrophic, arthrodesis was elected.

DISCUSSION

Dislocations of the metacarpophalangeal joint of the long fingers are uncommon. They are usually complex and require open reduction (3). These injuries are most common at the index and small fingers where the pathology and the operative management are well documented (3,4). Isolated dislocation of the MCP joint of the third finger is rare (1,5,6). Two cases of palmar dislocation were reported by Mc Laughlin (*in 1*) and Wood and Dobyns (*in 1*). Imbriglia and Sculli reported a case of open dorsal complex dislocation (*in 1*). In all the literature consulted, only four cases of isolated closed dorsal complex dislocation of the third MCP joint

are reported : Gilbert (5) (one case), Sedel (6) (two cases) and Nussbaum and Sadler (1) (one case). As in our experience, hyperextension of the MCP joint was reportedly the responsible mechanism for all these dorsal dislocation (1,4,5,6).

In a complex dislocation of the index finger, the metacarpal head is flanked on the radial side by the lumbrical muscle and on the ulnar side by the flexor tendons (3,4). At the small finger, the flexor tendons lie on the radial side together with the lumbrical muscle (4). Concerning MCP dislocation of the third finger, in our cases, the flexor tendons and lumbrical muscles were always located on the ulnar side. Gilbert (5) described one case and carried out dissections in fresh cadaver hands and stated that these structures always lie on the ulnar side. However, in the case reported by Nussbaum and Sadler (1), the flexor tendon appeared on the ulnar side and the lumbrical muscle on the radial side. These structures play a limited role in the entrapment mechanism, and the replacement of the flexor tendon in its normal position does not allow reduction (1,2,3,4).

We found as others (1,2,4,5,6), that in a dorsal dislocation of the MPJ, the volar plate, which is detached from its weakest attachment to the neck of the metacarpal, is always interposed into the joint and represents the most important element preventing reduction. The deep transverse ligament lies in direct continuity with the volar plate ; this

anatomic relationship is also, in part, responsible for the irreducibility (1,3,4). Our findings are in line with those of Green and Terry (4), Nussbaum and Sadler (1) and Barry *et al* (2) and support their suggestion to divide the deep transverse ligament to aid in reduction of the volar plate. We also found the dorsal approach to be simple and effective in our cases. It avoids the risk to damage the digital nerve and it allows better access to the frequently associated osteochondral fracture of the metacarpal head (2,3).

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