

## Dorsal Dislocation of the Metacarpophalangeal joint of the Left Index Finger in a Left-Handed Nigerian Teenager

<sup>1</sup>Taiwo, A.O., <sup>2</sup>Adebola, O., <sup>3</sup>Ojelabi, S.O.

<sup>1,2,3</sup> (Department of Surgery, Babcock University Teaching Hospital Ilisan-Remo, Ogun State, Nigeria)

**Abstract:** Dislocation of the metacarpophalangeal joint is relatively rare. We present the case of a 19 year old male left handed Nigerian, who had a complex dorsal dislocation of the metacarpophalangeal joint of his left index finger. Following 2 failed attempts at closed manipulative reduction, he had a successful open reduction under a wrist block. 7 weeks post-surgery, he has full range of motion in the affected hand with normal function comparable to the contralateral hand.

**Keywords:** Left index finger, Metacarpophalangeal joint dislocation, Volar plate

### I. Introduction

Dislocations of the metacarpophalangeal joints are relatively uncommon. In the presence of volar plate injuries, often with intra-articular volar plate entrapments, closed manipulative reductions have higher failure rates. These injuries are commoner in young, active individuals

### II. Case Report

Mr A.O, a 19 year old left hand dominant student presented at our emergency department with a 30<sup>0</sup> hyperextended left index finger metacarpophalangeal joint (MCPJ) and a 5<sup>0</sup> flexed proximal interphalangeal joint of the same digit (Fig.). This followed blunt trauma sustained after an attempt to catch a basketball. He also complained of severe pain at the affected joint with reduced range of motion.

Plain radiographs confirmed a dorsal dislocation of the left D2 MCPJ with a chip fracture of the head of the 2<sup>nd</sup> metacarpal (Fig 2). He had 2 failed attempts at closed manipulative reduction necessitating an open reduction under wrist block with a sterile proximal hand Esmarch tourniquet applied.

Intraoperative findings were a dorsal dislocation of the left index finger MCPJ with a moderate dorsal displacement of the head of the 2<sup>nd</sup> metacarpal (Fig 3). There was also an intra-articular volar plate entrapment. A dorsal approach was employed. The joint spontaneously reduced with release of the entrapped volar plate. The wound was closed in layers. Full range active and passive movement of the digit confirmed intraoperatively. Post-operative radiographs also confirmed satisfactory reduction of the dislocation (Fig 4).

Post-operatively, the left hand was splinted with the MP joints flexed. Patient was discharged 1st day post op in a buddy splint of both the index and the middle digit. Seven weeks post-operative outpatient examination showed range of movement and power in the affected digit similar to that of the contralateral digit with no functional impairment.

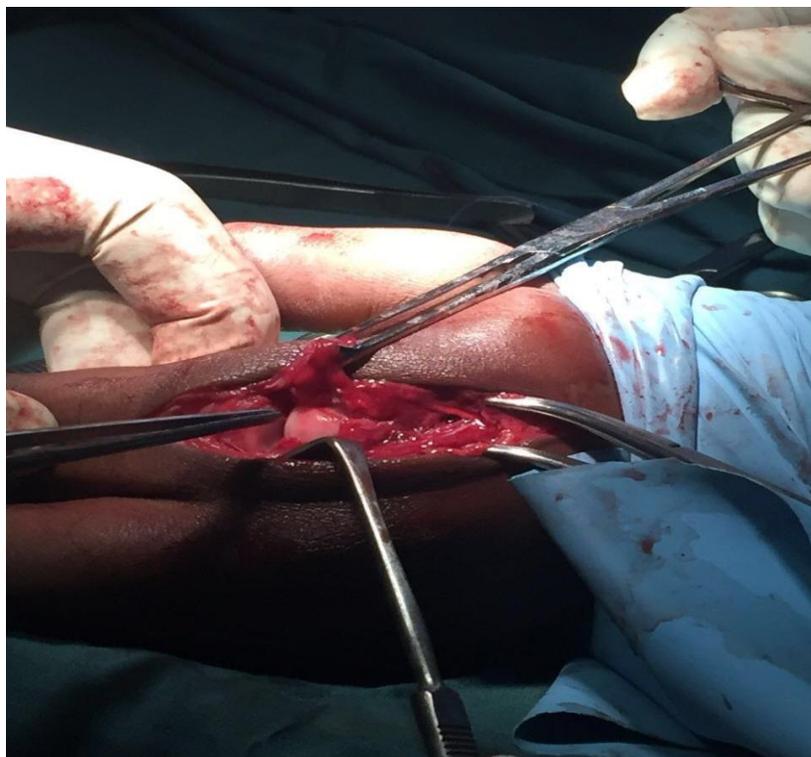
### III. Figures



**Figure 1:** Post injury clinical photograph showing left index dorsal metacarpophalangeal dislocation with hyperextension attitude of MCP joint



**Figure 2:** Preoperative radiographs (Anteroposterior and Lateral views) showing dorsal dislocation of the left D2 MCPJ with a chip fracture of the head of the 2<sup>nd</sup> metacarpal.



**Figure 3:** Intraoperative photograph with Esmarch tourniquet in situ. Exposed 2<sup>nd</sup> metacarpophalangeal joint demonstrated.



**Figure 4:** Post-operative radiographs showing a reduced dislocation of the MCPJ of D2 of the left hand

#### **IV. Discussion**

The MP joint of the fingers is a condyloid joint, consisting of a relatively ovoid metacarpal head articulating with an elliptical cavity at the base of the proximal phalanx.

The metacarpal head is narrower dorsally than palmarly in the sagittal plane, and it has a proportionately larger anteroposterior diameter than that of the phalangeal head. The MP joint capsule extends from the metacarpal neck to the base of the proximal phalanx. Volarly, the joint capsule blends with the volar plate, which consists of a thick fibrocartilagenous distal portion and a thin membranous proximal portion<sup>1</sup>. With hyperextension injuries to the MP joint, the volar plate usually ruptures off the metacarpal neck. The most commonly dislocated MP joints are the index finger followed by the ring and little fingers. Most of these injuries occur when the fingers are extended, a position in which the supporting collateral ligaments are more lax. The dislocations are classified based on the direction of the dislocation (dorsal versus volar) and whether they are easily reducible (simple) or irreducible without surgical intervention (complex).<sup>2,3</sup>

It is important to ascertain which hand is the dominant hand, as affectation of the dominant hand increases the significance of the morbidity to the patient as was the case in the discussed patient.

The predominant factor that prevents closed manipulative reduction is the volar plate. Other factors include the flexor and adductor tendons, the extensor expansion, the collateral ligaments, the capsule, and the sesamoid bones (if the thumb is involved). An improper closed reduction may also convert a simple dislocation into a complex one. If hyperextension with traction is mistakenly used, the volar plate can slip dorsally over the metacarpal head and prevent reduction<sup>4</sup>. Clinically, the joint is slightly hyperextended, with the phalanx appearing parallel to the metacarpal with a tendency for the digit to overlap its neighbor. On the palmar surface, the skin is puckered or dimpled. Radiographically, the joint space is widened, the joint surfaces are offset, and the sesamoid appears to lie within the joint.<sup>5</sup>

Closed reduction is done via these steps:

First, attempt a single effort at a closed reduction under a good anesthetic in the operating room with the wrist flexed to relax the flexor tendons. Regional or general anaesthetic methods may be used, a wrist block offers the extra benefit of assessing function post reduction by active range of movement at the joint.

Apply pressure dorsally and distally to the base of the proximal phalanx while attempting to slide the proximal phalanx over the metacarpal head. Confirm reduction clinically and radiographically<sup>1</sup>. Assess active

and passive joint stability, splint the hand with the MP joints flexed for a few days for comfort, and start early active motion with an extension-block splint. If a closed joint reduction fails, perform an open reduction.

Volar or dorsal approaches are used in open reduction depending on the nature of the injury and surgeon's preferences. Volar approaches however carry a greater risk to neurovascular structures but a thorough knowledge of the finger's anatomy will help reduce this.<sup>6</sup> Occasionally, a volar approach might require an additional dorsal incision in the presence of operative difficulties.<sup>7</sup> The Collateral ligaments' stability, and joint function should be evaluated post operatively and early mobilization begun to prevent joint stiffness.

## V. Conclusion

Dislocation of the MCPJ is relatively uncommon. A thorough clinical and radiologic evaluation would help differentiate a simple from complex dislocation. Care must be taken during closed reduction to avoid converting a simple to complex dislocation. The surgeon must have a sound knowledge of the anatomy of the structures involved and the merits and demerits of the different surgical approaches. Surgery is feasible with regional approaches like wrist blocks. Functional and radiographic checks post-operative are very important. Early mobilization post operatively helps prevent joint stiffness.

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