



KAPLAN LESION (2nd METACARPOPHALANGEAL JOINT DISLOCATION) MANAGED BY OPEN REDUCTION WITH DORSAL APPROACH: A CASE REPORT

Orthopaedics

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ABSTRACT

2nd metacarpophalangeal joint dislocation, also known as Kaplan Lesion, is a rare entity. A complete dislocation requires open reduction. Here we present a case managed with dorsal approach rather using the conventional volar approach as the dorsal approach has the advantages of direct exposure of the fibrocartilaginous volar plate, less chances of neurovascular injury. After relocating the volar plate, wound was closed and the hand was put in a POP back slab in functional position of the hand for 3 weeks and physiotherapy was started.

KEYWORDS

Kaplan's lesion, dorsal approach, extension block splint, early physiotherapy

1. BACKGROUND:

Metacarpophalangeal joint dislocation is less commonly seen than interphalangeal joint dislocation. Kaplan's lesion involves the index finger. Incomplete dislocation can be reduced by closed manipulation but the complete dislocations often need open reduction. The basic pathoanatomy involves avulsion of the fibrocartilaginous plate, usually from the volar aspect of the metacarpal neck. Normally the MCP joint dislocation is prevented by the strong capsule-ligamentous attachments. The capsule is reinforced by the volar plate, deep transverse metacarpal & collateral ligaments radially, extrinsic & intrinsic tendons and sagittal bands ulnarly. Following a hyperextension force, shearing of the volar plate occurs from the metacarpal neck and it gets lodged between the metacarpal head and base of the proximal phalanx, thus creating a hindrance for the closed reduction. Lateral collateral ligaments lock the phalanx in an abnormal dorsal position. The dislocated metacarpal head is surrounded by natatory ligament distally, superficial transverse ligament proximally, lumbricals radially and flexor tendons ulnarly. Sometimes closed manipulation may relocate the joint but multiple failed attempts may cause fracture of the metacarpal head. The volar approach described by Kaplan is a conventional way for open reduction but associated with more chances of neurovascular compromise.

2. CASE PRESENTATION:

A 15 years old male presented to our emergency room with the complaints of pain, swelling and deformity over the base of the right index finger following a sports injury (hit by cricket ball directly over the base of index finger). On examination, there was hyperextension of the 2nd MCP joint, flexion of the proximal and distal IP joints, index finger was deviated radially, a palpable bony mass over the base of the index finger on the volar aspect.



Fig 1 : preoperative clinical photograph showing hyperextension of the 2nd MCP joint, flexion of IP joints (A classical Kaplan lesion)

The patient was advised for digital x-ray of the hand anteroposterior and oblique views. The x-rays showed dorsal dislocation of the proximal phalanx of the index finger with a chip fracture of the 2nd metacarpal neck. After thoroughly going through the x-rays, open reduction with dorsal approach was planned.



Fig 2: preoperative radiograph showing dorsal dislocation of the proximal phalanx of the index finger

With the patient in supine position in the operating table, wrist block was given. After proper painting and draping, one 4cm longitudinal incision was given over the dorsum of the head of the 2nd metacarpal. After skin and subcutaneous tissue, extensor tendon and capsule were splitted longitudinally. The strong, shiny, glistening white in colour, volar plate was then identified and found completely dorsally dislocated. To reduce the dislocation, wrist was planter-flexed to release the tension of the flexor tendons simultaneously giving traction on the fingers and flexing the MCP joint. Using mosquito forceps, head of the metacarpal was gently elevated and relocated. The stability was confirmed by flexing and extending the finger and adequacy of reduction was confirmed by direct naked eye and parallel orientation of the fingers. The osteochondral fragment was found to be very small and therefore removed. The extensor tendon and skin were closed in layers. A sterile bulky dressing was applied and hand was put in an extension block POP slab maintaining the functional position of the hand.

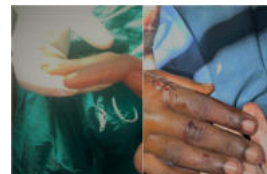


Fig 3: post operative clinical photograph showing relocated 2nd MCP joint

3. POST OPERATIVE CARE:

The patient was discharged in the following day, sutures were removed on 14th post-operative day. Active finger movement was encouraged from post-operative day 1. The extension block splint was maintained for 3 weeks.



Fig 4: immediate post-operative radiograph shows anatomically reduced 2nd MCP joint

4.FOLLOW-UP:

The patient was followed up every week for the first month and subsequently once in a month for another 3 months. Check x-rays were done at 3 weeks and 6 weeks. Grip strengthening exercises were started from 4 weeks. Patient regained almost normal range of motion in the MCP joint, PIP joint and DIP joint after 4 months.

5. DISCUSSION:

Many literatures have been published on volar approach of Kaplan lesion. In this approach, extensive release of the volar structures along with the volar plate are performed & therefore having the high risk of radial neurovascular bundle injury. The dorsal approach was first popularised by Becton et al. They reported a series of 9 cases of complex MCP joint dislocation managed by both the approaches. It was noted that few patients treated with volar approach had sensory impairment over the radial aspect of the injured finger. On the other hand, the patients treated with dorsal approach had almost full recovery. In this approach, the risk of neurovascular bundle injury is very less. Kaplan advocated the release of superficial transverse metacarpal ligament and distal natatory ligament though it was nullified by De Coster because of the risk of iatrogenic dislocation following the release of these ligaments. According to Murphy et al. the deep transverse metacarpal ligament may have to be released sometimes for getting the reduction. The volar plate dislocates dorsally and prevents the reduction. It can be easily identified by dorsal approach by its shiny, glistening appearance almost like the capsule. It should be identified properly and may have to be incised longitudinally to get the reduction. As it is a major stabiliser of the joint, incising it longitudinally is therefore highly not recommended because of the risk of iatrogenic chronic subluxation and poor recovery. In a study of Becton & Bohart, 50% of the cases were associated with osteochondral fractures. Usually they are on the dorsal side and can be addressed easily from the dorsal approach.

6. CONCLUSION:

Proper knowledge of the Kaplan lesion is necessary to diagnose it early and manage properly. Open reduction is often required to reduce this lesion. Both volar and dorsal approaches can be used for the open reduction but the dorsal approach is preferable because of easier exposure of the patho-anatomy and less chances of neurovascular injury.

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