Learning points

- nephrotic syndrome is a hypercoagulable state
- thrombotic episodes are frequent manifestations of the hypercoagulable state in nephrotic syndrome
- although less common than venous thrombosis, arterial thrombosis may be life-threatening
- normal coronary vessels may be seen in young patients with acute myocardial infarction
- a hypercoagulable state is a possible contributory factor to coronary artery thrombosis
- normal coronary angiography should prompt a search to rule out an underlying hypercoagulable state

Box 4

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state.¹⁰ In all patients with a proven myocardial infarction and normal coronary vessels, a search should be made for any of these conditions.

Final diagnosis

Nephrotic syndrome complicated by acute antero-septal myocardial infarction.

Keywords: nephrotic syndrome; myocardial infarction

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A dislocated finger

C H Gerrand, P M Jarrett

A 64-year-old man presented 12 hours after he fell onto his hand whilst intoxicated. X-Rays are shown in figure 1.

Figure 1 X-Rays of the patient's hand at presentation

Questions

- 1 What does the radiological appearance suggest?
- 2 What is the anatomy of this injury?
- 3 What is the correct treatment?

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Answers

QUESTION 1

The X-rays show dislocation of the metacarpophalangeal joint of the right middle finger. The attitude of the proximal phalanx which lies almost parallel to the metacarpal suggests a complex dislocation.

QUESTION 2

Kaplan's description of this injury in the index finger is elegant.¹ At the time of injury, the fibrocartilaginous volar plate breaks away from its weakest attachment to the volar aspect of the metacarpal neck. Further force displaces the flexor tendons to the ulnar side and the lumbrical muscle to the radial side of the metacarpal head. The volar plate becomes trapped

in the joint and the collateral ligaments hold the proximal phalanx in an abnormal position (figure 2). Three transverse bands of fascia have been implicated in the dislocation; the *natatory ligaments* which are transverse fascial fibres spanning the web spaces just beneath the skin, the *superficial transverse metacarpal ligament* which consists of transverse fibres of palmar fascia bridging the gaps between the longitudinal pretendinous bands, and the *deep transverse metacarpal ligament* which runs between the volar plates in front of the metacarpals.² The deep transverse ligament is the most intimately involved of these as it attaches to the volar plate and traps it in the joint. The other two bands are said to trap the metacarpal head, the superficial transverse metacarpal ligament on the volar aspect and the natatory ligament on the dorsal (figure 3).

A. Simple dislocation

B. Complex dislocation

Figure 2 (A) Simple dislocation. Note the hyperextended position of the metacarpophalangeal joint. (B) Complex dislocation. The volar plate is trapped in the metacarpophalangeal joint. The proximal phalanx lies almost parallel to the metacarpal

QUESTION 3

Closed reduction is successful in half of all cases. The joint is hyperextended, the articular surface of the proximal phalanx is applied firmly to the metacarpal neck and the joint is flexed.³ Attempts at closed reduction should not be prolonged.

Open reduction can be performed through a volar or a dorsal approach. The volar approach to the index finger described by Kaplan¹ can be adapted to the middle finger.⁴ An incision is made in the thenar crease of the palm. Care is taken not to damage the neurovascular bundle which is pushed forward by the metacarpal head. The natatory ligament, the superficial transverse ligament and the deep transverse metacarpal ligaments are all divided and the volar plate removed from the joint with a blunt hook. The joint is reduced and the volar plate reattached to the base of the proximal phalanx.

In the approach described by Becton *et al*,⁵ a dorsal incision is made over the metacarpophalangeal joint, splitting the extensor tendon and joint capsule in the same line. A longitudinal incision is made in the volar plate which permits reduction of the joint after flexing the wrist to relax the flexor tendons.

Postoperatively, some authors recommend mobilisation within a week,^{2 6-8} but others splintage for up to three weeks.⁵

In this case, closed reduction in the Accident and Emergency department under metacarpal block was attempted unsuccessfully. Open reduction was performed through a volar incision. The digital nerve lay superficially under the skin and was preserved. Reduction was achieved after dividing the A1 pulley, mobilising the flexor tendon and fully releasing the volar plate from its proximal attachment. A padded wool and crepe bandage was applied for a week, after which the index and middle fingers were neighbour-strapped and physiotherapy commenced. At four months the patient was discharged with normal power and strength in the hand but a 10 degree block to full flexion of the metacarpophalangeal joint.

Figure 3 Diagram showing the structures which entrap the metacarpal head as they appear at operation. (Reproduced with permission from Kaplan EB. Dorsal dislocation of the metacarpal phalangeal joint of the index finger. *J Bone Joint Surg (Am)* 1957;1081–6.)

Discussion

Complex dislocation of the metacarpophalangeal joint is a relatively rare injury^{1–5} which usually follows hyperextension of the joint after a fall on the outstretched hand.^{2–9} In order of frequency, this occurs most often in the thumb, the index finger, the little finger, the long finger and the ring finger.⁸ Complex dislocation of a central digit is uncommon because the volar plate is supported on both sides by the transverse metacarpal ligament¹⁰ and so there may be dislocation of the adjacent bordering digit.⁹

Learning point

Inexpert manipulation of a simple dislocation of the metacarpophalangeal joint may convert it to a complex dislocation requiring open reduction

On examination, the metacarpophalangeal joint lies in a position of slight extension and ulnar deviation. The metacarpal head is palpable in the palm and there may be pathognomic puckering of the skin overlying it.¹ If the joint is hyperextended, the dislocation is likely to be a simple one which can be reduced closed² although inexpert manipulation can convert it to a complex dislocation.

X-Rays confirm the clinical diagnosis and may reveal an associated osteochondral fracture of the metacarpal head or a sesamoid bone in the joint which is pathognomic of volar plate entrapment, as it lies within it.^{2–7} The volar approach may put the radial neurovascular bundle at risk,² but allows reconstruction of the volar plate. A dorsal approach through skin and extensor tendon permits reduction of the joint but does not allow reconstruction of the volar plate, and there is a theoretical risk of late instability.^{5–11} If the volar plate is not completely avulsed from the deep transverse metacarpal ligament, a scissoring deformity may result.¹² If reduction is not delayed, recovery is usually complete, although persisting anaesthesia secondary to digital nerve injury has been described.^{4–5–8–10–11}

Final diagnosis

Complex dislocation of the metacarpophalangeal joint of the right middle finger.

Keywords: metacarpophalangeal joint; dislocation; finger

Thanks to Mr JF Crossan for permission to report his patient.

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