CARPOMETACARPAL DISLOCATION

AN EASILY MISSED DIAGNOSIS

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We have reviewed 21 cases of dorsal dislocation of carpometacarpal joints. In 15 of them the diagnosis was missed when they were first seen in an accident and emergency department. General swelling may obscure the characteristic clinical deformity and routine radiographs may not show the displacement clearly. It is recommended that a true lateral radiograph of the hand be requested when this injury is suspected.

Dislocation of the carpometacarpal joints, other than that of the thumb, is an uncommon injury; the diagnosis can be easily missed (Green and Rowland 1984). Dislocation may be in a palmar or dorsal direction, and there may be associated fractures of adjacent metacarpal or carpal bones (Hazlett 1968). We report a series of these dislocations, all in a dorsal direction, involving the third, fourth and fifth carpometacarpal joints alone or in combination.

PATIENTS

The case notes and radiographs of 21 patients who had suffered a carpometacarpal dislocation were studied. They had presented at several different accident and emergency departments in the northwest of England. There were 19 men and two women, with an average age of 32.5 years (range 18 to 65 years). The dominant hand was involved in 18 cases.

RESULTS

The diagnosis had been missed in 15 of the 21 cases when they first presented at an accident and emergency department; it was missed again in five cases when they were reviewed by a senior registrar or consultant in orthopaedic surgery. The delay in diagnosis was from two to 10 days in ten patients, from three to eight weeks in three, and four months in two. Only six of the 21 were diagnosed at first presentation.

The most common mechanism of injury was punching (nine cases) or a fall on the hand (seven cases). Fracture of the base of the fourth metacarpal with dislocation of the fifth carpometacarpal joint was the commonest injury, seen in 10 cases (Fig. 1). Dislocation of the fifth carpometacarpal joint was seen alone in four cases and in combination with dislocation of the fourth joint in another four (Figs 2 and 3). One patient had fracture of the base of the third metacarpal, with dislocation of the fourth and fifth joints, while there was one case of isolated dislocation of the fourth joint and one of dislocation of the third and fourth joints.

Of the 11 patients treated by closed reduction, four were held in a plaster cast alone, while seven had this supplemented by Kirschner wire fixation. None of these dislocations was more than 10 days old.

Nine patients required open reduction; one had a compound injury and another had an associated fracture of the hamate which required fixation, but in four of the other seven cases the diagnosis had been delayed for more than three weeks. In two late cases arthrodesis was necessary.

All patients had regained full function of the hand within four months of reduction or operation. One patient with simple dislocation at the fourth and fifth joints, diagnosed four months after injury, failed to attend for treatment.

DISCUSSION

There are two main clinical signs: dislocation of the base of the fifth metacarpal causes ulnar deviation of the little finger (Helal and Kavanagh 1977-78), while dorsal dislocation of the third, fourth and fifth carpometacarpal joints produces a characteristic lump on the dorsum of the hand. This may, however, be masked by generalised swelling.

In many hospitals routine radiographs of an injured

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Fig. 1

Fig. 2

Fig. 3

Figure 1 - Fracture of the base of the fourth metacarpal with dislocation of the fifth carpometacarpal joint. Figure 2 - Dislocation of the fifth carpometacarpal joint. Figure 3 - Dislocation of the fourth and fifth carpometacarpal joints.

Fig. 4

Fig. 5

Figure 4 - Postero-anterior view of a normal hand showing the parallel joint surfaces at the carpometacarpal joints. Figure 5 - Dislocation of the fifth carpometacarpal joint showing loss of parallel joint surfaces, overlap of joint surfaces, and ulnar offset of the metacarpal base.

hand include only postero-anterior and oblique views. A postero-anterior radiograph of a normal hand should show a clear joint space between the bases of the metacarpals and the carpus, with parallel joint surfaces (Fig. 4). After dislocation this parallelism is lost; there is overlap, and possibly an offset (Fig. 5) of the base of the fifth metacarpal (Fisher, Rogers and Hendrix 1983). The appearance of fractures of the base of the metacarpals or of the hamate should arouse suspicion, and the apparent "shortening" of a metacarpal, which may best be seen at

metacarpophalangeal joint level, also indicates possible dislocation.

It has been suggested that a carpometacarpal dislocation will be shown better in an oblique radiograph (Nalebuff 1968) or one taken with the forearm pronated by 30° from the anteroposterior position (Bora and Didizian 1974), but both Hazlett (1968) and Dennyson and Stother (1976) have suggested that a lateral radiograph is of more value. In several of our cases, the postero-anterior radiograph appeared virtually normal,

Fig. 6

Fig. 7

Fig. 8

Radiographs of a hand with dislocation of the fourth and fifth carpometacarpal joints and fracture of the base of the third metacarpal. Figure 6 – Postero-anterior view. Figure 7 – Oblique view. Figure 8 – A lateral view clearly shows the dislocated metacarpal bases.

the oblique view was thought to show no major abnormality, and only the true lateral view of the hand revealed the dislocation (Figs 6 to 8). In our series, only postero-anterior and oblique radiographs of the hand had been taken at the initial presentation of 11 of the 15 cases with delayed diagnosis. Four of the six cases with no delay in diagnosis had had lateral radiographs.

Several authors have suggested that old unreduced carpometacarpal dislocations do not cause symptoms or functional disability (Shorbe 1938; Whitson 1955). However, these dislocations disrupt both the longitudinal and the transverse arches of the hand, resulting in an impaired grasp and loss of the normal axial length (Imbriglia 1979). Three of our patients had had unreduced dislocations for more than two months; they all had definite functional disability with a decreased range of movement at the metacarpophalangeal joints, and a poor grip. Full function was restored in two cases after open reduction; the third patient failed to attend for treatment and was lost to follow-up. It appears that closed reduction is usually successful in dislocations less than 10 days old, and an unstable reduction can be held with percutaneous Kirschner wires. When three weeks or more have elapsed since injury then open reduction will be necessary.

Conclusions. The diagnosis of carpometacarpal dislocation can be missed not only by an inexperienced casualty officer, but also by an experienced orthopaedic surgeon. Swelling may mask the characteristic deformity, and routine postero-anterior and oblique radiographs may not show the displacement clearly.

We recommend that a lateral radiograph of the

hand be requested when a routine postero-anterior view of the injured hand shows loss of parallelism or of symmetry at the carpometacarpal joints, overlap of joint surfaces, or apparent shortening of the metacarpals. It should also be considered when a patient has general swelling of the dorsum of the hand after an injury, with no obvious abnormality on the "routine" radiographs.

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