LATE REDUCTION OF THE DISLOCATED LUNATE

A METHOD USING DISTRACTION BY AN EXTERNAL FIXATOR

J. VEGTER

From the Regional Hospital Helmond-Deurne, The Netherlands

The management of carpal dislocation after a late diagnosis is difficult. Open reduction is the usual treatment but collapse of the carpus may be hard to overcome without extensive dissection and consequent damage to the blood supply, ligaments and articular cartilage.

A technique of distraction by an external fixator followed by semi-closed reduction is described and its successful use is reported in two cases.

The treatment of a neglected carpal dislocation can be difficult because the carpus tends to collapse. An extensive operation may be required to create sufficient space for reduction (Green and O'Brien 1978; Howard and Dell 1986), but this inevitably adds to the damage and increases the chance of later arthritic change. However, when a 27-year-old man was seen eight months after a perilunate dislocation we found that late reduction by means of distraction was possible.

A small Wagner lengthening apparatus (Wagner 1972) was used. After 10 days of gradual distraction, the proximal pole of the capitate bone was almost level with the dorsal edge of the lunate, and at open operation through a dorsal approach the dislocation was easily reduced. Two years later the patient's function was reasonably good, though there was some loss of grip strength and moderate radiographic degeneration in the lunocapitate joint. This successful reduction encouraged a trial of semi-closed reduction after distraction. The technique and two cases are reported.

TECHNIQUE OF OPERATION

An external fixator with a distraction device is attached to the dorsum of the wrist by two pins in the second and third metacarpals and two in the distal radius (Fig. 1). Under fluoroscopic control distraction is applied until the proximal pole of the capitate bone is level with the dorsal angle of the lunate (Fig. 2). A stab incision is then

made on the volar aspect of the wrist at the level of the pisiform and just lateral to the tendon of palmaris longus. A blunt probe is eased through to the distal surface of the lunate (Fig. 3). Pressure in a proximal and dorsal direction allows replacement of the lunate (Fig. 4); reduction is completed by decreasing the distraction (Fig. 5) and, if necessary, by applying pressure to the distal row of the carpus.

To allow healing and to protect the articular cartilage from excess pressure the external fixator is left in situ with slight distraction for two weeks and without distraction for another four weeks. The fixator is then removed, a detachable splint provided and the wrist gradually mobilised.

CASE REPORTS

Case 1. A 36-year-old man was seen six weeks after a fall on the right wrist. Radiographs showed a volar dislocation of the lunate and an attempt at closed reduction under brachial plexus anaesthesia at another hospital was unsuccessful. The patient was referred to us and a dynamic axial fixator (De Bastiani, Aldegheri and Renzi Brivio 1984) was used to distract the radio-carpal complex (Figs 6 and 7).

Closed reduction was still not possible, but the percutaneous probe method was successful. Reduction was completed by decreasing the amount of distraction (Fig. 8). The external fixator was removed six weeks later. After five months the patient had returned to his work as a truck driver with a practically normal range of movement at the wrist, and no radiological signs of traumatic arthritis or carpal instability.

Case 2. A 23-year-old man fell on his left wrist while playing soccer. Radiographs taken one day after the injury were thought to be normal. Five weeks later he still had pain and new radiographs showed a lunate dislocation (see Fig. 1).

Distraction and percutaneous probing under image intensifier control, as shown in Figures 2 to 4, achieved partial reduction which was completed by pressure on the distal row of the carpus and decreasing the distraction force (see Fig. 5). After six weeks the fixator was removed and at four months the patient had full movement and had returned to his job as a bricklayer. Six months after reduction there were no radiographic signs of carpal instability or of degenerative arthritis.

J. Vegter, MD, Orthopaedic Surgeon
Regional Hospital Helmond-Deurne, Wesselmanlaan 25, Helmond,
The Netherlands.

© 1987 British Editorial Society of Bone and Joint Surgery
0301-620X/87/5141 \$2.00

Case 1. Lateral radiographs taken before, during and after reduction.

DISCUSSION

The main advantages of this method of reduction are the avoidance of additional vascular damage, the preservation of joint cartilage and of any undamaged capsule or ligaments. After reduction the rigid external fixation also prevents the secondary collapse and deformity which may occur during treatment in plaster (Lindscheid et al. 1972; Adkinson and Chapman 1982; Fisk 1984).

After reduction of a carpal dislocation it is essential to assess and correct any residual intercarpal malalignment, a sign of carpal instability. In this context the angle between the scaphoid and the lunate bones on a

lateral radiograph is important. In normal wrists this angle varies from 28° to 101° (Lindscheid et al. 1972; Sarrafian, Melamed and Goshgarian 1977; Rawlings 1981), because of anatomical variation as well as differences in the position used for radiography (Kauer 1974). This problem of variation can be avoided by taking one radiograph of both wrists supported on a Perspex frame in the "Madonna in prayer" position (Fig. 9) thus obtaining symmetrical lateral views (Fig. 10). When this film shows a clear difference in angle between the normal and injured sides, the position of the scaphoid in relation to the lunate can be corrected

Fig. 9

Fig. 10

Figure 9 – The “Madonna in prayer” position with the forearms on a Perspex support. This ensures that the lateral views of the two wrists are comparable and that any difference in the angle between scaphoid and lunate is not due to the wrists being in different positions. Figure 10 – A “Madonna in prayer” view after reduction and external fixation in Case 1. The angle formed by lines subtended by the contours of the lunate and the scaphoid are similar on the injured and the normal sides.

by adjustment of the distal articulating head of the external fixator.

Although only two cases are reported they have been so successful that the practical and theoretical advantages of the technique seemed worthy of this preliminary report.

The author is grateful to Dr J. S. A. Davidson for referring Cases 1 and 2 and Mr Th. M. G. van Hout for the photography.

REFERENCES

- Adkinson JW, Chapman MW. Treatment of acute lunate and perilunate dislocations. *Clin Orthop* 1982;164:199–207.
- De Bastiani G, Aldegheri R, Renzi Brivio L. The treatment of fractures with a dynamic axial fixator. *J Bone Joint Surg [Br]* 1984;66-B:538–45.
- Fisk GR. Review article. The wrist. *J Bone Joint Surg [Br]* 1984;66-B:396–407.
- Green DP, O'Brien ET. Open reduction of carpal dislocations: indications and operative techniques. *J Hand Surg* 1978;3:250–65.
- Howard FM, Dell PC. The unreduced carpal dislocation: a method of treatment. *Clin Orthop* 1986;202:112–6.
- Kauer JM. The interdependence of carpal articulation chains. *Acta Anat (Basel)* 1974;88:481–501.
- Lindscheid RL, Dobyns JH, Beabout JW, Bryan RS. Traumatic instability of the wrist: diagnosis, classification and pathomechanics. *J Bone Joint Surg [Am]* 1972;54-A:1612–32.
- Rawlings ID. The management of dislocations of the carpal lunate. *Injury* 1981;12:319–30.
- Sarrafian SK, Melamed JL, Goshgarian GM. Study of wrist motion in flexion and extension. *Clin Orthop* 1977;126:153–9.
- Wagner H. Technik und Indikation der operativen Verkürzung und Verlängerung von Ober- und Unterschenkel. *Orthopäde* 1972;1:59–74.