CASE REPORT

The use of finger traps to achieve peroperative reduction of unstable fractures and dislocations around the base of the fifth metacarpal

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Unstable fractures of the fifth metacarpal with or without dislocation of the carpometacarpal joint, such as those shown in Fig. 1, can be successfully treated with Kirschner wire fixation. Reduction is usually achieved through manual traction of the digits which must be maintained whilst K-wires are inserted. This can be an awkward and difficult procedure if an assistant is not available.

The use of finger traps to apply traction has been used in the management of fractures of the distal radius and in positioning patients for wrist arthroscopy. We describe the use of a similar technique to quickly reduce fracture dislocations of the fifth metacarpal allowing the surgeon to operate unassisted, whilst maintaining complete control of the reduction.

Under general or regional anaesthesia (brachial plexus block) the patient is positioned supine. Finger traps are applied to the little and ring fingers of the affected arm. The arm is suspended from a rail attached to two drip stands with the elbow flexed to 90° and the humerus parallel to the floor (Fig. 2). The height of the hand can be adjusted by altering the height of the drip stands or the height of the table. The collapsible lattice of the finger traps enables them to grip the digits without damaging the underlying skin. Traction is applied by suspending a small sandbag or bag of saline inside a length of stockingette, tied over the upper arm tourniquet cuff (to prevent pressure problems). Leaving traction applied for a few minutes often reduces the fracture and/or dislocation spontaneously, but if not, it can be easily reduced with simple dorsal pressure. Traction is maintained throughout the procedure. Due to the vertical positioning of the hand the tourniquet need not be inflated.

Access is available for the c-arm of an image intensifier to accurately provide peroperative radiological screening (Fig. 3). The forearm can be easily rotated to provide AP and lateral views without having to alter the position of the image intensifier. Percutaneous K-wires can now be inserted using one hand to control the power drill and the other hand to control rotation of the forearm (Fig. 4). To maintain reduction, K-wires are inserted from the fifth metacarpal base into the hamate and from the fifth metacarpal into the fourth metacarpal (Fig. 5). The K-wires are either cut and buried beneath the skin, or if preferred, they can be left through the skin. Once fixation has been achieved a plaster of Paris slab is applied whilst the hand remains in the finger traps, completing the procedure without the need for an assistant.

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The use of finger traps to achieve peroperative reduction

Figure 1  (a–c) AP, lateral and oblique radiographs demonstrating a fracture dislocation at the base of the fifth metacarpal.

Figure 2  Dorsal view of the hand after finger traps are applied and the arm positioned.
Figure 3  Peroperative radiological screening is provided by an image intensifier.

Figure 4  Kirshner wires are inserted with the image intensifier in position.
This technique has been used for the past 2 years in the hand surgery unit in our hospital, enabling operations to be carried out quickly, efficiently and by a single surgeon. The average operating time, including patient positioning and set up of the image intensifier, is 20 min with no cases of loss of reduction. In our opinion, this technique reduces operative time, makes efficient use of theatre resources, allows surgery to be performed single-handedly and represents a safe and reproducible method of reduction and fixation.

References


Figure 5  (a–c) AP, lateral and oblique images demonstrating the position of Kirshner wires across the base of the fifth metacarpal.