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TECHNICAL NOTE

Dorsally angulated proximal phalanx fractures : Closed reduction and rigid fixation using a reversed extension splint

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Dorsally angulated proximal phalanx fractures have always presented a difficulty for treatment. A variety of options for treatment have been tried in the past, many of these are operative options and therefore carry the risks of a surgical procedure. We present a case of a conservatively managed proximal phalanx fracture using a reversed dynamic or static finger extension splint, such as Roylan® Sof-Stretch. The finger was immobilised using this splint and achieved bony union and very good function at both the metacarpophalangeal and proximal interphalangeal joints.

Keywords : proximal phalanx ; fracture ; angulation ; extension splint.

INTRODUCTION

Management of dorsally angulated mid shaft proximal phalanx fractures is a difficult problem that can lead to debilitative joint stiffness. The topic has caused much debate as to the position of the Kirschner wires, whether lag screw fixation or tension band wires give better results. Horton, Hatton and Davies in a randomised controlled trial reported no significant difference in the pain scores, or functional recovery rates between K wire and lag screw fixation of transverse and spiral fractures (*3*). Hornbach and Cohen reported a case series of twelve patients treated with trans-articular K-wires for extra articular fractures. Ten achieved a total active movement of 265°, but they reported one flexion contracture, one rotational deformity and one flexor tendon adhesion (*2*). Pehlivan *et al* reported that tension band wiring using transverse K-wires achieved a satisfactory functional outcome in twenty three patients (*4*). Diwalker and Stothard showed a 31% poor functional outcome with K-wires compared to 7% with AO mini-screws, but the only statistically significant difference was the time taken to return to work (*1*).

We advocate the use of a simple device, that can maintain the reduction of dorsally angulated extra-articular fractures and that also allows movement of the metacarpophalangeal and interphalangeal joints.

TECHNIQUE

We present a case of a 31-year-old paramedic who sustained a transverse extra-articular proximal

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Fig. 1. — Lateral radiograph showing 162° of dorsal angulation.

Fig. 3. — Roylan® Sof-stretch extension splint – reversed

Fig. 2. — Lateral radiograph showing the correction to 175° using the splint.

Fig. 4. — AP and Lateral Radiographs after 3 weeks showing callus formation and correction of the angulation to 179°.

phalanx fracture to his right dominant index finger whilst transferring a patient from an ambulance. Dorsal angulation measured 18° (fig 1).

The patient was reluctant to undergo surgery, and opted for an attempt of non-operative treatment. Neighbour strapping had already failed to maintain alignment of the fracture.

Closed reduction using a 1% lignocaine ring block allowed easy application of a reversed dynamic or static finger extension splint, such as Roylan® Sof-Stretch (Sammons' Preston Patterson Medical, UK) shown in the picture (fig 2-3). The tension required for the angle correction is variable, the splint can be easily adjusted and it is available in different sizes to fit all fingers.

Radiographs taken at three weeks showed evidence of radiological union and callus formation (fig 4).

The patient experienced no complications and required minimal physiotherapy to regain 260° of interphalangeal range of movement.

Application of this simple inexpensive device can satisfactorily treat unstable dorsally angulated fractures of the proximal phalanx, and avoid the need for percutaneous pinning.

REFERENCES

1. **Diwaker HN, Stothard J.** The role of internal fixation in closed fractures of the proximal phalanges and metacarpals in adults. *Brit J Hand Surg* 1986 ; 11 : 103-108.
2. **Hornbach EE, Cohen MS.** Closed reduction and percutaneous pinning of fractures of the proximal phalanx. *Brit J Hand Surg* 2001 ; 26 : 45-49.
3. **Horton TC, Hatton M, Davis TRC.** Prospective randomised controlled study of fixation of long oblique and spiral shaft fractures of the proximal phalanx : Closed reduction and percutaneous Kirschner wiring versus open reduction and lag screw fixation. *Brit J Hand Surg* 2003 ; 28 : 5-9.
4. **Pehlivan O, Kiral A, Solakoglu I, Kaplan AH.** Tension band wiring of unstable transverse fractures of the proximal and middle phalanges of the hand. *Brit J Hand Surg* 2004 ; 29 : 130-134.