Retrograde Percutaneous Intramedullary K-Wire Fixation for the Extra-Articular Proximal Phalangeal Base Fractures of Finger

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Objective

To introduce new percutaneous fixation method of the extra-articular proximal phalangeal base fracture.

Materials and Methods (Surgical Technique)

With the proximal phalangeal joint of the involved finger fully flexed, 1 or 2 0.065 or 0.045 inch K-wires were inserted through the proximal phalangeal head using drill (Fig. A).

Once the insertion was made, further advancement across the fracture site to the articular surface of proximal phalangeal base was made using mallet to avoid iatrogenic thermal injury to articular cartilage of the proximal phalangeal head. The thickness and number of the K-wire was selected to fit the intramedullary space well to supply maximum fracture stability. During the advancement, longitudinal traction of the involved finger was made to maintain reduction. Once the intramedullary K-wire came up to the articular surface of the proximal phalangeal base, metacarpophalangeal joints were flexed up to 45 degrees and the distal end of K-wire was tapped using mallet to penetrate articular cartilage and dorsal skin of metacarpophalangeal joint. Once the proximal end of K-wire was protruded through dorsal skin, it was secured with a manual wire holder. The wire was then hammered until the image intensifier confirmed that the distal end of the wire was just within the subchondral bone of proximal phalangeal head, clear of articular cartilage (Fig. B).

The wire was bent back distally from the point of bending. Dorsal splint was applied with the metacarpal phalangeal joint 45 degrees of flexion (Fig. C).

K-wires were removed at postoperative 4 weeks, and physiotherapy was initiated.

Results

30 fingers in 22 patients were treated with this method. All fractures were united at the average of postoperative 5.6 weeks (range, 5-8). At the final follow up, range of motion of the proximal interphalangeal joint and metacarpophalangeal joint were reached to 100% and 98% compared to contralateral side respectively. In 2 fingers, superficial pin site infection at dorsal skin of metacarpophalangeal joint occurred but resolved with K-wire removal.

Conclusion

Based on our experience, retrograde percutaneous intramedullary K-wire fixation is a simple and acceptable alternative method for the treatment of extra-articular proximal phalangeal base fractures. Especially this method is very useful for multiple digit proximal phalangeal base fractures.