A-0983 Antegrade intramedullary pinning in subacute fifth metacarpal neck fracture after failed conservative treatment
Soo Min Cha, Hyun Dae Shin
Chungnam National University School of Medicine, Chungnam National University Hospital, Daejeon, Korea

Introduction
- Fifth metacarpal neck fracture is the most common type of metacarpal fracture and comprises 25% of all metacarpal fractures.
- A recent systematic review/meta-analysis suggested that conservative methods are a reliable option and minimize the complications related to surgery.
- The purpose of this study was to evaluate the efficacy of antegrade intramedullary pinning performed for neck fractures with angulations of over 30° after failed conservative treatment during the subacute phase (4–6 weeks after injury), and to compare the radiologic and clinical results with those of acute fractures with angulations of over 30° treated via the same procedure.

Methods
- Seventy-three patients with a fifth metacarpal neck fracture, were admitted to our institute between January 2010 and April 2015.
- Among them, 26 patients with an acute fracture (Group 1) and 27 patients with a subacute fracture (Group 2) after failed conservative treatment who met the inclusion/exclusion criteria were investigated.
- After surgery, improvements in angulation and shortening, visual analog scale (VAS) score for postoperative pain, Disabilities of the Arm, Shoulder, and Hand (DASH) score, active range of motion (ROM), and grip strength were evaluated and compared.

Results
- The mean durations of surgery from injury were 4.92 and 32.74 days in Groups 1 and 2, respectively, with a significant difference (p < 0.001).
- The preoperative amounts of angulation were 44.91° and 45.89° and the amounts of preoperative shortening were 3.31 and 3.44 mm, respectively, with no significant difference (p > 0.05).
- At the final follow-up, the angulation had definitively improved compared with before surgery in both groups (p < 0.001, both). However, there was a slight significant difference in terms of the residual angulation of 3.35° and 5.56° in Groups 1 and 2, respectively (p = 0.02).
- Preoperative shortening was restored in both groups (p < 0.001, both) and the final state of residual shortening were similar (p = 0.06). The final VAS scores, DASH scores, ROM, and grip strength were all satisfactory in both groups without any significant difference.

Conclusion
- The failed treatment group, which had been predicted to obtain proper union through the initial use of conservative treatment, provided an adequate indication for non-invasive antegrade pinning.
- Additionally, the current study suggested that closed reduction/immobilization remains a primary recommendation for angulated metacarpal neck fracture as long as careful observation is conducted if progression of the reduced fracture towards dorsal angulation is suspected.

Figure 1A–E. (A) Forceful hyperextension for the breakage of callus was performed. First, the finger was hyperextended at the MP joint two or three times. Further, forceful push-up against the angulated head of the metacarpal bone on the palm was made by both of the surgeon’s thumbs. (B) Then, a K-wire that had been bent more than the wire used in Group 1 was used. (C) The first bent K-wire was inserted similar to the dorsally convex fashion, maintaining MP joint extension. (D) Finally, the joystick handle was rotated 180° to minimize the volar angulation of the distal fragment. (E) The second K-wire was inserted as per the above method.

Figure 2A–D. (A) A 19-year-old male presented with an acute angulated fifth metacarpal neck fracture in right side (Group 1). (B) The apex angulation was measured as 42° on 3D computed tomography images. (C) Closed reduction and antegrade intramedullary pin insertion were performed. (D) At the final follow-up, the apex angulation was measured as 18°, and clinical outcomes were satisfactory.

Figure 2A–D. (A) A 23-year-old male presented with an angulated fifth metacarpal neck fracture. He had been injured 4 weeks previously and manual reduction and a splint were applied. However, failure of the manual reduction was observed. The dorsal apex angulation was measured as 38° on 3D computed tomography images. Callus formation on the volar surface of the fracture was found. (B) Forceful reduction and intramedullary pinning were performed. (C) At the final follow-up, the apex angulation was measured as 6°, no shortening was observed compared with the contralateral normal side. The Disabilities of the Arm, Shoulder, and Hand score was 5.4, and the range of motion of the 5th metacarpophalangeal joint was 65°.

Figure 4. Treatment algorithm of an acute angulated fifth metacarpal neck fracture, suggested by authors.