

Volar Plating of 5th Metacarpal Neck Fractures

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Introduction

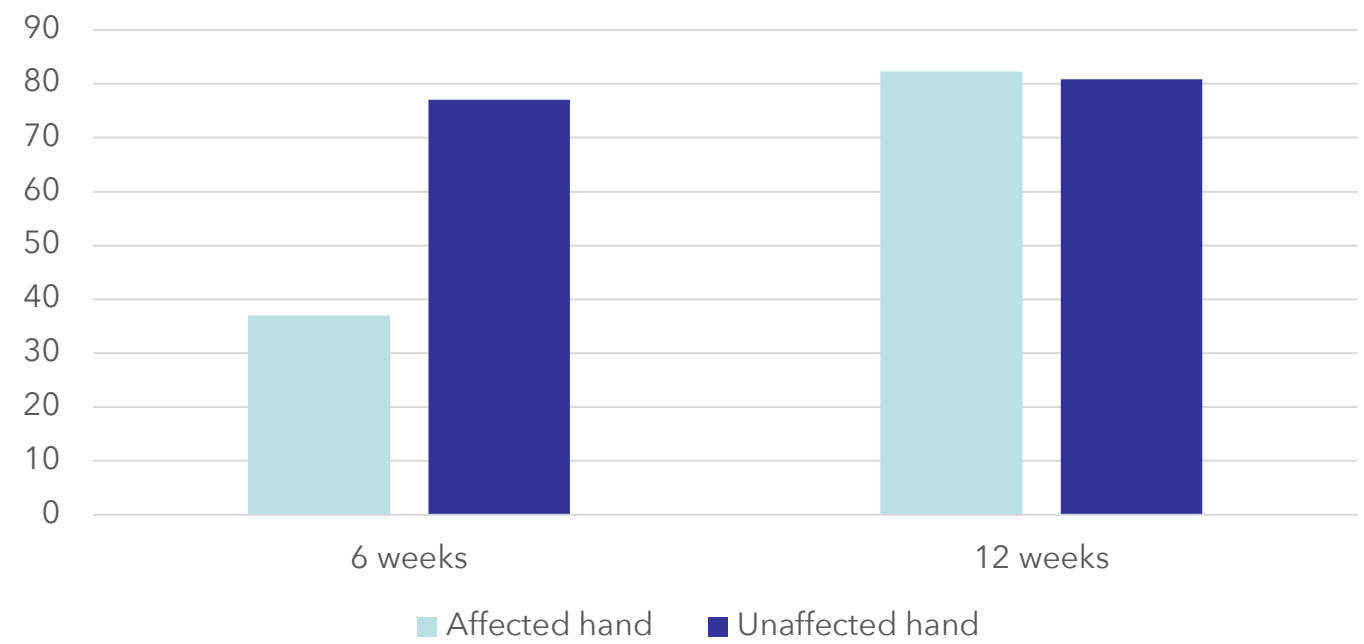
Fractures of the 5th metacarpal neck, also known as a boxers fracture, are one of the most common presentations in injuries of the hand¹. Current surgical fixation techniques include percutaneous Kirschner wire fixation, intramedullary Kirshner wire or pin fixation, tension-band wiring, external fixation and dorsal plating^{2,3,4}. A novel surgical technique has been utilized in our clinic, approaching the fracture and fixating from the volar aspect of the hand. 5th Metacarpal fractures are typically dorsally angulated and the biomechanical advantage of using the volar approach is that the buttressing effect of the fixation prevents volar collapse. This study presents the outcomes following this approach.

Methods

A retrospective investigation was carried out of the medical records of all patients who underwent surgical fixation of 5th metacarpal neck fracture using a volar approach performed in our centre between 2014-2018. Fifteen patients had undergone the surgical procedure. The mean age at time of surgery was 42 years (range 15-79years).

A wrist cock-up orthosis was fabricated for all patients and worn intermittently for 3 weeks. This splint was selected as it enables early functional use of the hand post-operatively and with the use of a flexion strap to the 5th digit (Figure 1) passive flexion of the MCPJ is facilitated as early as possible post-operatively.

Chart 2. Grip Strength (Lbs)



Results

QuickDASH: At 1-week post-operatively the mean score was 64.8 showing a clear limitation in activities of daily living. Quick-DASH values upon discharge were significantly lower, with a mean score of 3.2.

Range of Motion: Chart 1 presents the total active motion of the 5th digit and the range of flexion of the MCPJ. Functional range of motion at the MCPJ is 61° degrees of flexion⁵. At 6 weeks, 86% of patients achieved this or more.

Grip strength: At 12 weeks, grip strength had improved with the affected side scoring an average of 2.5% more than the unaffected side (Chart 2).

Radiographic parameters: All fifteen patients showed evidence of radiographic healing in the form of callus formation and remodelling by the 12-week mark. The patients recruited for the study had fractures with dorsal angulation ranging from 50° to 65°. Mean change in the neck shaft angle value post-operatively was 44.3°.

Discussion and Conclusions

Early rehabilitation is crucial to enable patients to regain their hand function for activities of daily living and work. At 6 weeks, 86% of patients had achieved or surpassed the functional range of motion at the MCPJ, suggesting that patients were able to return to most functional tasks at 6 weeks post-operatively.

Hypertrophic palmar scarring and scar contracture from poorly placed palmar incisions are a risk post-operatively. An advantage of this approach, however, is that the surgical scar is on the palmar surface of the hand, which was reported to be more aesthetically pleasing to patients as compared to the dorsal approach (Figure 2).

Further large scale research is required with a larger sample size and longer follow-up to determine tendon irritation from hardware and/or other potential complications. Possible future research may compare outcomes between this approach and a dorsal surgical approach in this population.

References

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Chart 1. Range of Motion

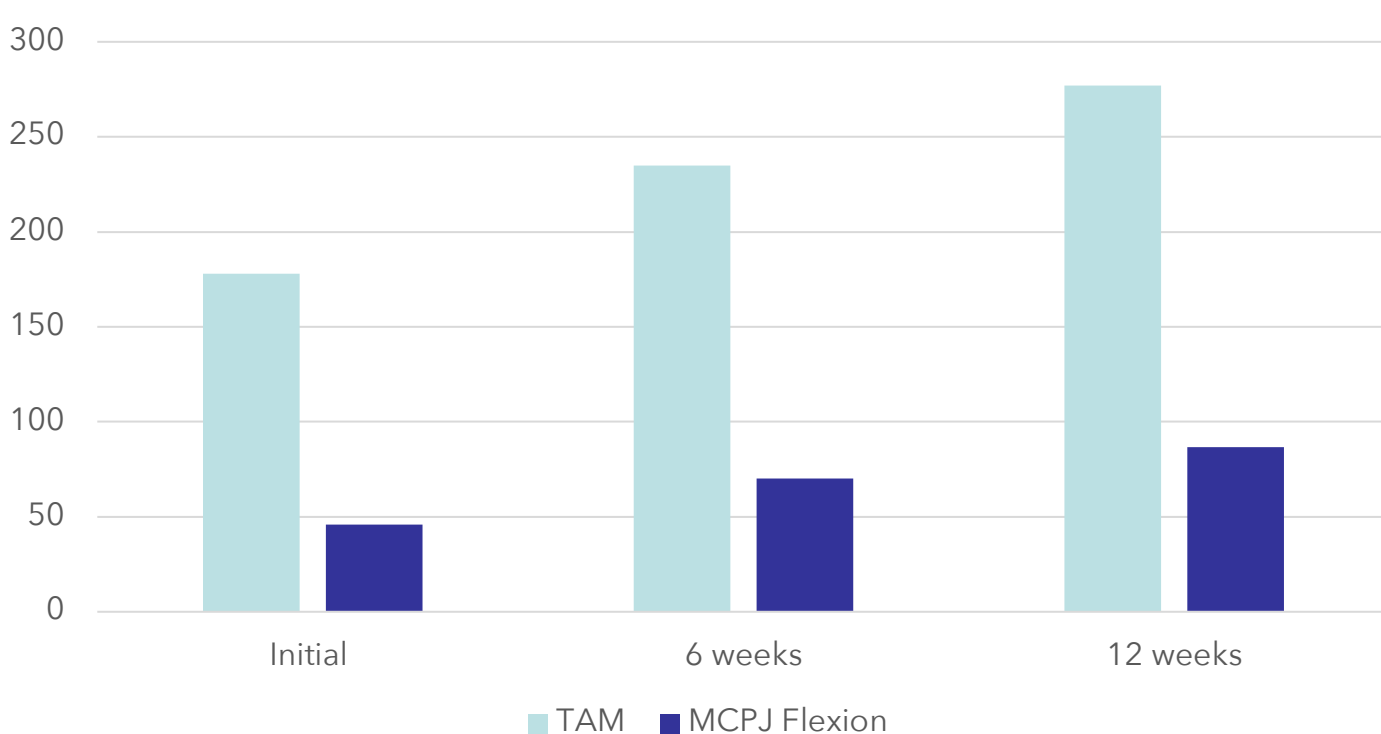


Figure 1. Post-operative splint with flexion strap (Above)



Figure 2. Pre and post-operative X-Ray and post-operative scar (Left)