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FUNCTIONAL OUTCOME OF SURGICAL MANAGEMENT OF METACARPAL FRACTURES

Orthopaedics

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ABSTRACT

Background: Metacarpal fractures account for 14–28% of hand injuries and often result from road traffic accidents, assaults, or falls [1]. **Objective:** To evaluate functional outcomes of surgical management of metacarpal fractures using Kirschner wires (K-wires). **Methods**: A prospective study of 50 patients with unstable, displaced metacarpal fractures surgically treated using K-wire fixation. Patients were followed up at 4, 6, and 10 weeks postoperatively. Functional outcomes were assessed using Total Active Motion (TAM) scores [2].**Results:** Among the 50 patients (83.4% male, mean age 35.3 years), the fifth metacarpal was the most frequently fractured (43.3%). The retrograde K-wire method was used in 80% of cases. By 10 weeks, 83.3% achieved excellent outcomes, and 64% had no complications. Mean TAM scores were 220° for digits II–V and 130.6° for the thumb. **Conclusion:** K-wire fixation is a reliable, effective method for managing metacarpal fractures with high functional recovery and minimal complications [3–5].

KEYWORDS

INTRODUCTION

Metacarpal fractures are among the most frequently encountered skeletal injuries of the hand, second only to phalangeal fractures [1-6]. Although conservative management is suitable for stable fractures, displaced or comminuted fractures often require surgical fixation [7]. Multiple studies have shown improved functional outcomes with surgical intervention compared to non-operative treatment [8–10].

METHODS

Study Design: Prospective cohort study
Setting: RMCH Hospital, Bareilly, Uttar Pradesh
Sample Size: 50 patients

Inclusion/Exclusion Criteria:
Adults (>18 years) with acute (<2 weeks), displaced, or comminuted metacarpal fractures were included. Patients with open fractures, pathological fractures, or those unfit for surgery were excluded.

Surgical Technique:
Retrograde or antegrade K-wire fixation was performed depending on fracture location and configuration [11,12]. All patients were immobilized postoperatively with a POP slab and instructed to begin active finger motion after suture removal.

Follow-up & Assessment: Functional outcome was assessed at 4, 6, and 10 weeks using TAM scoring criteria from the American Society for Surgery of the Hand [13].

RESULTS

Demographics: Mean age 35.3 years (range 18–60); 83.4% were male
Common Sites: 5th metacarpal involved in 43.3%
Mechanism of Injury: Road traffic accidents were the most common cause (63.3%)
Fixation Method: 80% retrograde, 16.6% antegrade, 3.3% transverse

Functional Outcome:
Excellent (TAM ≥210°): 25 patients (83.3%)
Good (180–210°): 3 patients (10%)
Fair (150–180°): 2 patients (6.6%)

Complications: Pain (20%), stiffness (13.3%), rotation (6.6%)

Union Time: Most fractures united by 10–12 weeks, comparable to literature [4,5,14]

DISCUSSION

The present study's results align with those of Somboon et al. (2009), who reported excellent outcomes with K-wire fixation in young adults [15]. Facca et al. also found K-wires superior to plates in terms of mobility and fewer complications [4]. Compared to other modalities like plate-screw fixation or mini-screws, K-wire offers quicker surgery and fewer soft tissue complications [8,10,16]. Most patients in our study achieved union within 10 weeks, similar to findings by Fatima et al. and Shah et al. [5,17].

CONCLUSION

K-wire fixation, especially by retrograde insertion, offers excellent functional outcomes for surgically treated metacarpal fractures. It remains a safe, effective, and cost-efficient method of internal fixation, particularly in resource-limited settings.

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