

Complications Rates and Postoperative Outcomes of Small Finger Metacarpal Fractures treated by Plate and Screw or Percutaneous Intramedullary Screw Fixation

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INTRODUCTION:

Metacarpal fractures are one of the most common orthopaedic injuries, with the small finger being the most frequently involved digit. When fractures require surgical fixation, options include closed reduction percutaneous pinning (CRPP), open reduction internal fixation using plates and screws (P&S), and intramedullary screw fixation (IMS). Certain small finger metacarpal fractures are amenable to either P&S or IMS. The purpose of this study is to compare the functional outcomes and complication rates between these techniques.

METHODS:

A retrospective review was performed of all patients that underwent P&S or IMS of small finger metacarpal neck or shaft fractures between the years 2015-2021 at a single, large private-academic institution. Postoperative patient-reported outcome (PROM) scores were collected (DASH and *QuickDASH*) and medical records were reviewed for complications, radiographic healing, and extension of the small finger metacarpophalangeal (MCP) joint by 8 weeks. Additionally, complications were subdivided into major and minor complications in accordance with previously published data on the subject. Demographic outcomes were analyzed using Chi-Square or Fisher's Exact Tests. All parametric data between treatment groups were tested for normality and then compared between the fixation modalities using T-tests or Mann-Whitney tests as appropriate with P-values less than 0.05 considered to be significant.

RESULTS:

A total of 112 patients (56 P&S, 56 IMS) were included in this study and each of the groups were similar in age at the time of procedure, sex, hand dominance, and laterality. Postoperative functional scores were similar among both groups with an average of 22.5 for IMS and 17.9 for P&S ($P = 0.32$), with no statistical difference noted when subdivided into DASH and *QuickDASH* scores ($P = 0.56$). MCP joint range of motion at 8 weeks postoperatively was greater, but not significantly so, in the IMS group when compared to P&S ($0-85^\circ$ vs. $1-80^\circ$, $P = 0.07$). Overall complication rate for the P&S group was significantly higher than IMS (39.0% vs. 12.2%, $P = 0.007$), which again held true when subdivided into minor complications (34.1% vs. 10.2%, $P = 0.012$) but did not maintain statistical significance in major complications (17.1% vs. 4.1%, $P = 0.074$).

DISCUSSION AND CONCLUSION:

Ultimately, this data suggests that both P&S and IMS can achieve acceptable outcomes when treating small finger metacarpal fractures, as is evident by their similar patient-reported outcome scores. However, patients treated with plates and screws in this cohort may be at higher risk of experiencing postoperative complications or limitations in range of motion and should be counseled as such preoperatively when discussing surgical options for these injuries.