Nonoperative Versus Intramedullary Fixation of Displaced Metacarpal Shaft Fractures

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INTRODUCTION:
Metacarpal fractures have a high incidence, with treatment options ranging from nonoperative management to various surgical fixation techniques. Nonoperative management can achieve good outcomes comparable to fractures treated surgically. More recently, a popularized surgical approach involves use of a fully threaded intramedullary nailing system. While this technique demonstrates promising clinical outcomes and patient satisfaction, little evidence exists on how threaded intramedullary nailing compares to non-operative treatment. We hypothesized that intramedullary nailing of displaced metacarpal shaft fractures would achieve better functional and radiographic short-term outcomes with no difference long term.

METHODS:
From 2017-2022, patients were prospectively collected, at a single institution, who sustained closed metacarpal shaft fractures. We then retrospectively compared patients who underwent surgical fixation via a fully threaded intramedullary nail to non-operative treatment with an immediate range of motion protocol. We included patients with a minimum three month follow up. Primary outcome measures included Quick Disabilities of the Arm, Shoulder, and Hand (QuickDash) scores, time to return to work (light/heavy duty), and radiographic shortening/angulation. Additional outcome measures collected included grip strength, visual analog scale (VAS) pain scores, total active range of motion, time to union, and complications.

RESULTS:
A total of 99 patients, comprising 109 fractures, were included in the study. Patients treated with intramedullary nailing demonstrated faster return to work both for light and heavy duty (1.2 weeks, 3.1 weeks, respectively) compared to non-operative management (2.2 weeks, 6.1 weeks, respectively). QuickDash scores normalized faster in the intramedullary nailing group, but there was no difference in QuickDash scores at long term follow up. There was no difference in grip strength in the operative (95% of contralateral side) and non-operative groups (98% of contralateral side). The intramedullary nailing group had less radiographic shortening (2.4mm) compared to the non-operative group (5.1mm) and less angulation at time of union (2° vs 30°). There were six cases of extensor lag with non-operative treatment and none in the operative group.

DISCUSSION AND CONCLUSION: Intramedullary nailing allows for faster return to work when compared to non-operative management and intramedullary nailing may provide less chance of extensor lag compared to non-operative treatment. Additionally, intramedullary nailing demonstrates better radiographic findings at time of union, however there are no differences in long term functional outcomes with intramedullary nailing of metacarpal shaft fractures compared to non-operative treatment. Overall, Intramedullary nailing of metacarpal shaft fractures improves short term outcomes but offers no difference in long term outcomes compared to non-operative treatment.