

Comparison Of Intramedullary Screw Fixation, K-wires, And Plating For Fixation Of Phalangeal Fractures: A Meta-Analysis

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INTRODUCTION

• Intramedullary screw fixation (IMF) has recently gained popularity for operative management of hand fractures¹

• IMF requires less dissection than plating, with quicker times to mobilization than Kirschner wires (K-wires)^{2,3}

Objectives:

• Compare functional outcomes of IMF, K-wires, and plating in the fixation of phalangeal fractures

Hypothesis:

• IMF provides similar function outcomes to K-wires or plating

METHODS

• Systematic review according to PRISMA guidelines, querying PubMed and EMBASE for the following criteria

• *Inclusion Criteria:* extra-articular middle and proximal phalangeal fractures in adults treated with either IMF, K-wires, or plating

• *Exclusion Criteria:* pediatric populations, cadaveric studies, or lack of relevant inclusion criteria

• *Primary Outcomes:* Disabilities of the Arm, Shoulder, and Hand (DASH) scores, total active motion (TAM)

Analyses:

• Random effects meta-analysis of DASH scores and TAM⁴

• Meta-regression investigating the effect of moderators on inter-study heterogeneity⁴

RESULTS

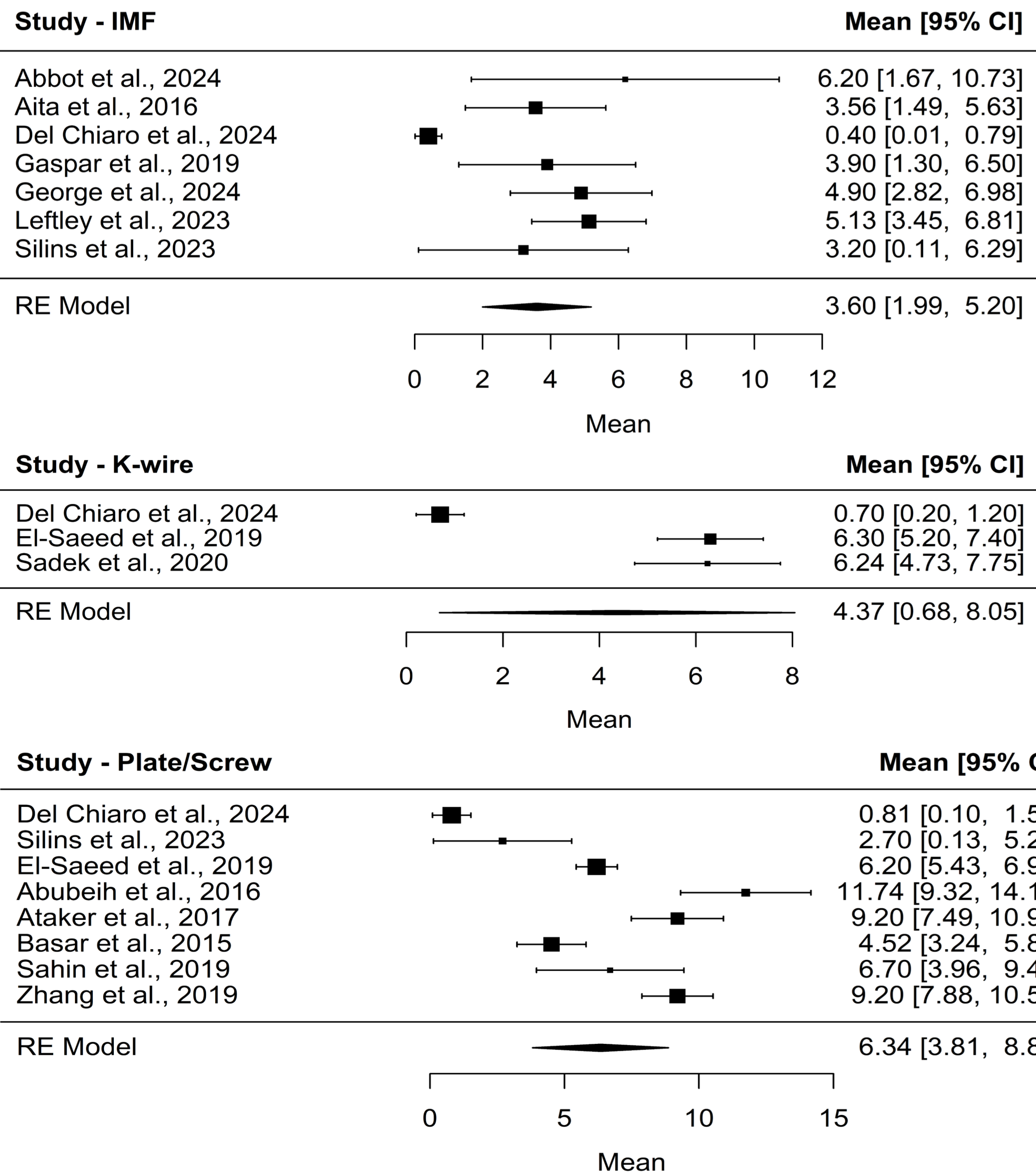
Meta-Analysis:

• 29 studies included (10 IMF, 10 K-wire, 14 plating)

• **No significant difference in DASH score or TAM across all 3 surgical interventions**, though IMF trended towards significantly higher TAM compared to plating

• High inter-study heterogeneity across all 3 surgical interventions

Figure 1. Forest Plots of Pooled DASH Scores

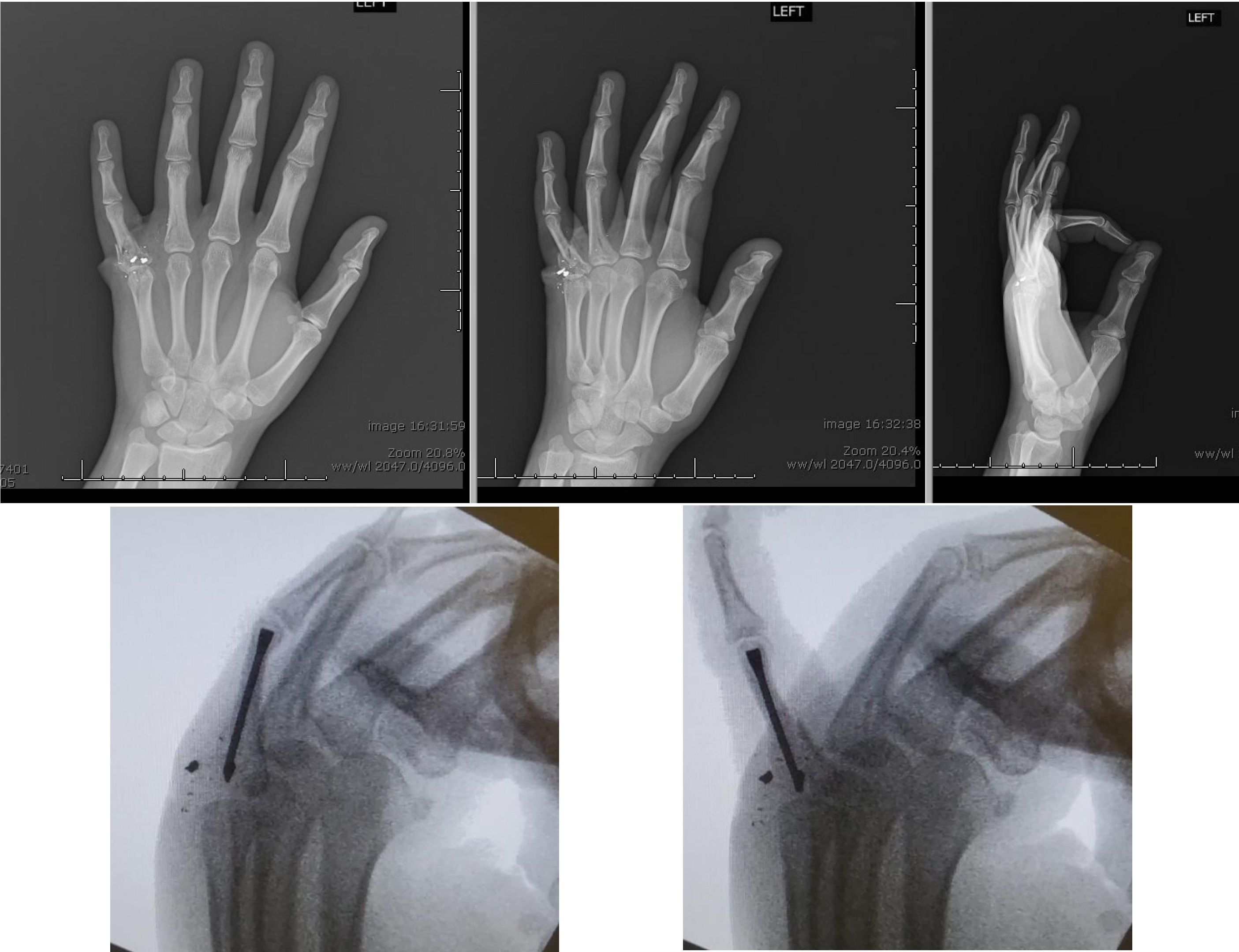
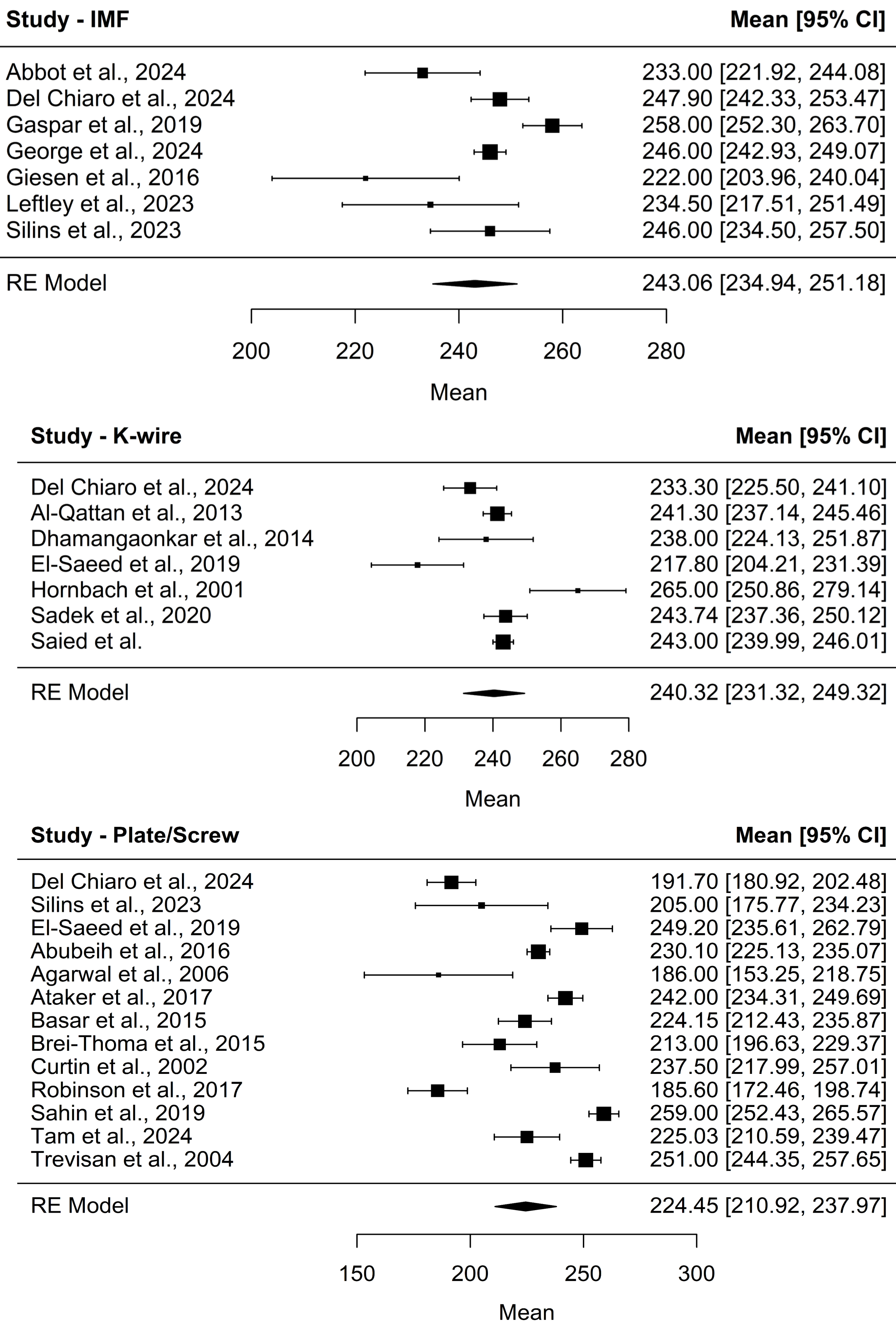


Meta-Regression:

• Length of follow-up and study sample size was significantly associated with heterogeneity in TAM from the IMF group (p = 0.0014)

• These modulators accounted for 87.3% of the observed heterogeneity

Figure 2. Forest Plots of Pooled TAM



CONCLUSIONS

• IMF yields noninferior functional outcomes compared to K-wires and plating of phalangeal fractures

• Inter-study heterogeneity was a limitation of this study, which was partially explained by sample size

Future Directions:

• Include secondary outcomes such as infection, malunion, and need for revision procedures

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