

Radiographic Templating for Tarsometatarsal Operative Fixation

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INTRODUCTION

- Lisfranc joint injuries are common and frequently require surgical reconstruction with the contralateral limb frequently serving as the anatomical guide for the surgeon.
- However, patients have considerable variability in their feet anatomy with no studies in the literature validating the contralateral limb as a reliable guide for successful reconstruction.
- The purpose of this study is to demonstrate evidence that the contralateral limb can be used as a reliable guide when restoring patient anatomy in midfoot injuries.

METHODS

- Retrospective review of 440 patients who obtained bilateral foot and calcaneus radiographs was performed.
- Exclusion criteria included age <18 or >89, fractures on either foot, Charcot arthropathy, osteomyelitis, tumor, congenital deformities, and previous foot surgeries.
- The 1st-intermetatarsal angle (IMA), talo-1st-metatarsal angle (T1MA), Meary’s angle (MA), and calcaneal inclination (CI) were measured.
- The side-to-side difference and inter-subject variability were analyzed using the mean absolute percentage side-to-side difference (MAPSSD) and the coefficient of variation (COV) to yield the ratio of variation (ROV). ROV greater than 1 indicates greater inter-subject variability than intra-subject differences.

Angle Definition

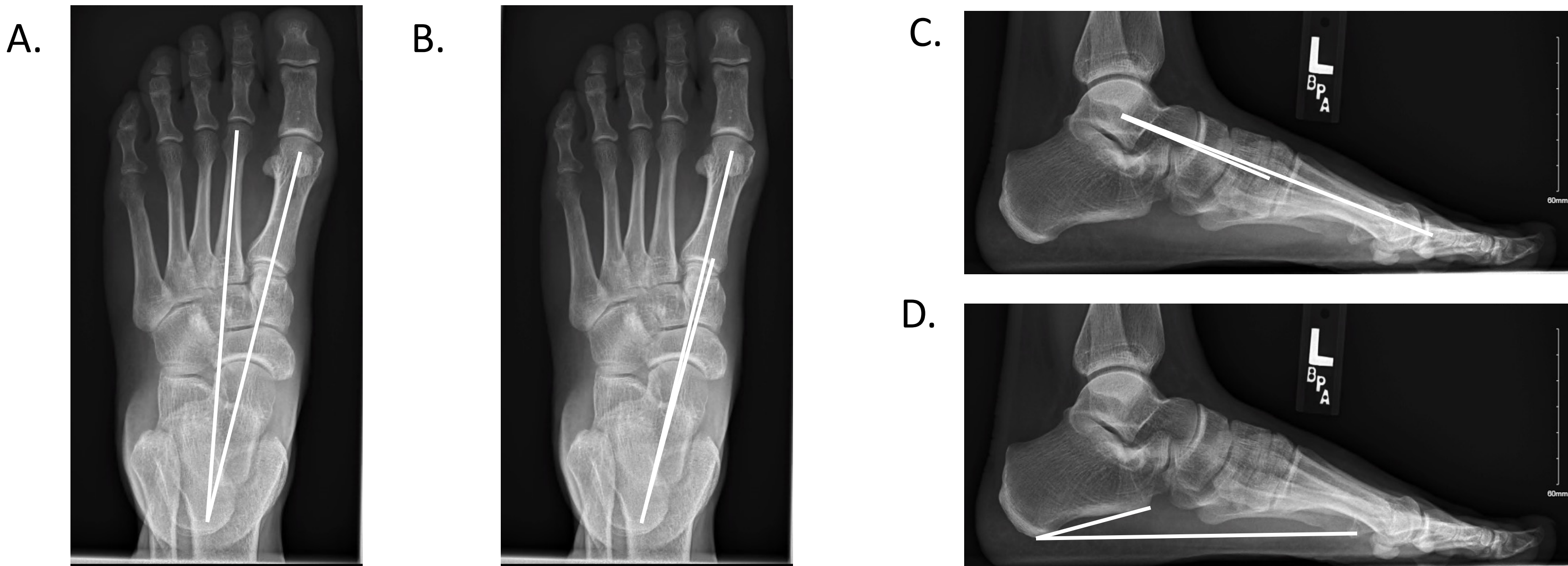


Figure 1. Angle Definition: (A) IMA¹; (B) T1MA¹; (C) MA²; (D) CI².

RESULTS

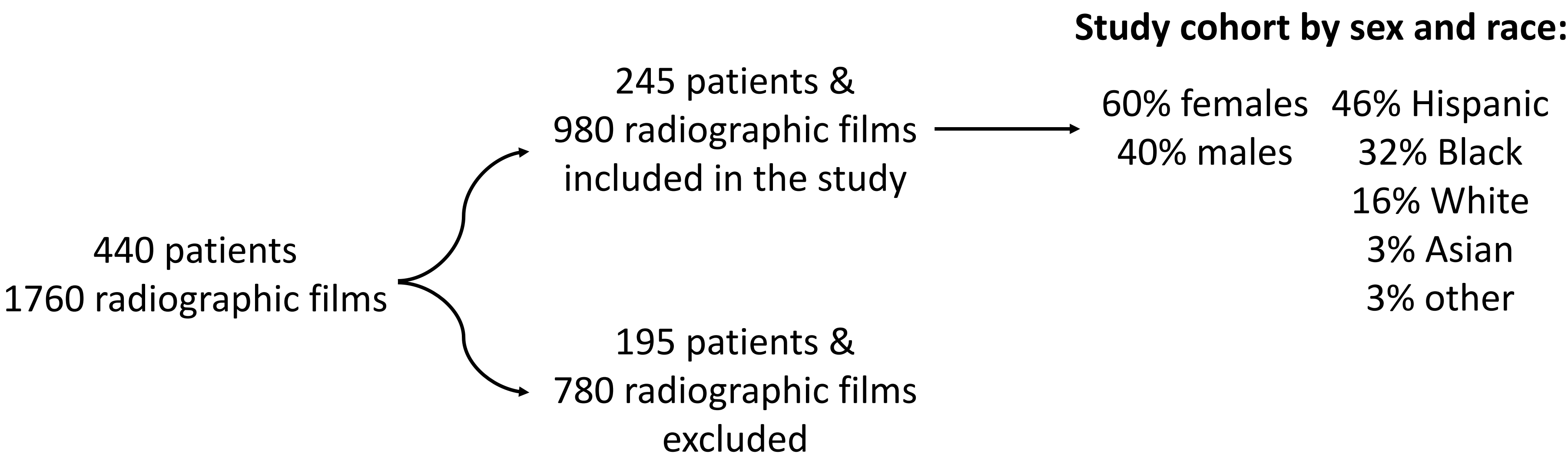


Figure 2. Study Flow Diagram and Cohort Distribution.

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RESULTS CONTINUED

- Ratio of Variation for all four parameters studied was greater than 1, indicating one foot is more similar to a foot from the same person than from a different person.
- Male sex was associated with a smaller IMA angle.
- Hispanic ethnicity was associated with a smaller T1MA angle.
- Older age and Black race were associated with a smaller MA angle.
- White race was associated with a larger CI angle.

Parameter	Left	Right	Mean Absolute Percentage of Side-to-Side Difference	Coefficient of Variation	Ratio of Variation
IMA	8.9° ± 3.4°	9.3° ± 3.4°	24.6 ± 21.9	37.3	1.5
T1MA	5.3° ± 5.0°	5.8° ± 6.0°	82.6 ± 60.2	99.2	1.2
MA	10.5° ± 9.3°	8.6° ± 9.5°	75.5 ± 110.3	99.1	1.3
CI	20.1° ± 6.5°	20.2° ± 6.8°	15.4 ± 15.6	33.0	2.2

Table 1. Inter-subject and Intra-Subject Variability of Metatarsal Parameters.

DISCLOSURE

- No Disclosures

CONCLUSION

- Midfoot anatomy is more different between individuals than it is between their own feet
- This validates using the patient’s contralateral foot as a surgical guide for midfoot injuries