Success rate for 1st TMT fusion:
A review of 682 cases with a minimum of 2 year follow-up

Mark Steeves, MD
Alistair Younger, MD
Kevin Wing, MD
Murray Penner, MD
University of British Columbia
Vancouver, BC, Canada
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Purpose

• This study was designed to evaluate the revision rate for 1st tarsometatarsal joint attempted fusions for symptomatic nonunion.

Background

• Symptomatic 1st tarsometatarsal joint (TMTj) arthritis, metatarsus primus varus, flat foot correction, and hallux valgus have been reportedly treated with fusion of the 1st TMTj.

• Concern of 1st TMTj symptomatic nonunion motivates some surgeons to pursue alternate treatment options for hallux valgus.

• Reported 1st TMTj nonunion requiring surgical revision rate varies (0-7.5%), with a 1% rate reported in large series of 201 attempted fusions as the initial procedure (Thompson et al, 2005).
Methods

- A retrospective review from 2004 – 2010 identified all patients treated with a primary 1\textsuperscript{st} TMTj attempted fusion by 3 surgeons from a single institution.

- All revision surgeries during the study period, and subsequent 2 years were identified.

- Patients were >19 years old, with varying pathology chosen to be treated with 1\textsuperscript{st} TMTj fusion.

- The cohort studied are in a geographic and economically contained population, reducing the loss to follow-up.

- Varied techniques with common principles for cartilage removal, fenestrating the subchondral bone, reduction, stable compression fixation (either with cortical screws or locking plate plus lag screw) were used by all surgeons.

- The revision rates between surgeons, and to the reported rate (1%) by Thompson et al. were compared.
Results

- 682 attempted 1st TMTj fusions were performed in 592 patients
- 10 revision surgeries were performed (1.5%)
  - 9 for symptomatic nonunion
  - 1 for symptomatic malunion
- Revision rates by surgeon:
  - Surgeon A: 7 of 457 (1.53% with 95% CI: 0.4 - 2.6%)
  - Surgeon B: 1 of 141 (0.71% with 95% CI:-0.7 - 2.1%)
  - Surgeon C: 2 of 82  (2.43% with 95% CI:-0.9 - 5.8%)
Results

• Comparing each surgeon’s 1st TMTj attempted fusion revision rates, by Chi square test, there was no statistically significant difference (p>0.05).

• Comparing the average revision rate for this study to the 1% (2 of 201) reported by Thompson, by Chi square test, there was no statistically significant difference (p=0.59).
Discussion

• 1st TMTj surgery performed by foot and ankle sub-specialist surgeons has a low revision rate for symptomatic nonunion (%1.5).

• Possible factors contributing to this success:
  – Experienced foot and ankle surgeons.
  – Pre-operative patient education.
  – Support from multidisciplinary team of nurses and physical therapists with post-operative care.

• Limitations of this study:
  – Defining the success by revision rate leaves the possibility of symptomatic patients not wishing to pursue revision surgery.

  – The study cohort may have experienced revision surgery outside of this institution, yet it is the belief of the senior authors that most patients have been captured in this study.
Conclusion

- 1st TMTj surgery performed by foot and ankle sub-specialist orthopaedic surgeons has a predictably low revision rate for symptomatic nonunion (1.5%).
References


• Thompson IM, Bohay DR, Anderson JG. Fusion rate of first tarsometatarsal arthrodesis in the modified Lapidus procedure and flatfoot reconstruction. Foot Ankle Int. 2005 Sep;26(9):698-703.