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Tarsometatarsal Nonunion: Is There an "Easier" Solution?

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49 Y/O Female

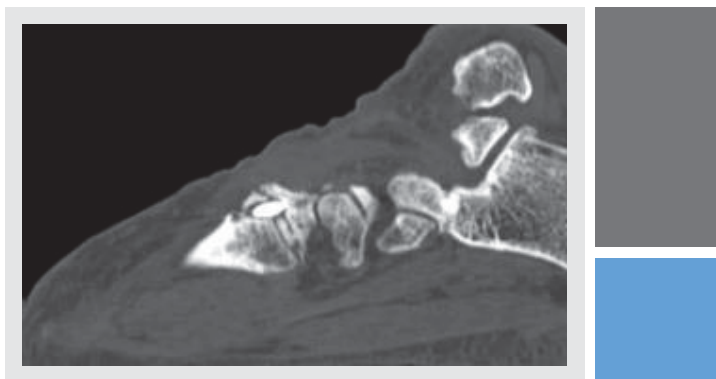
- Gastrocnemius Recession
- Evans Osteotomy
- PT tendon Augmentation
 - Lapidus
- 2nd TMT Arthrodesis

What increases the risk of a nonunion?

- Construct stability
- Smoking
- Diabetes
- Osteoporosis
- Compliance with weightbearing instructions
- Infection

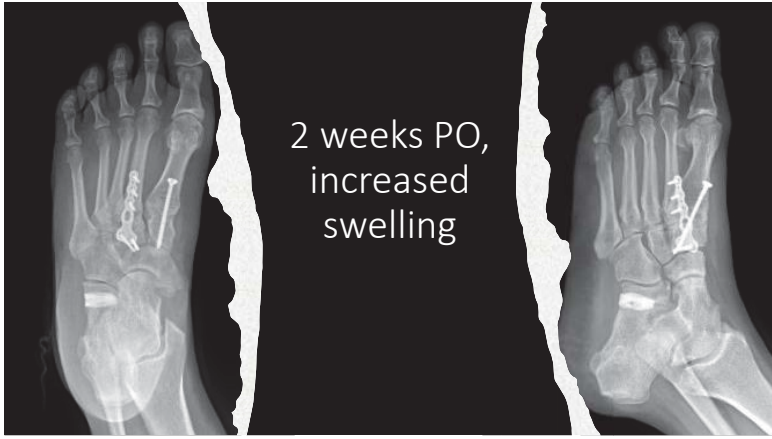
Surgical Disadvantages

← Difficult to Access → ← Difficult Preparation →



Revision of 2nd TMT

- Plate fixation
- Orthobiologics



2 weeks PO,
increased
swelling



PO Incision and
drainage of
abscess superior
to the hardware,
bone biopsy
negative



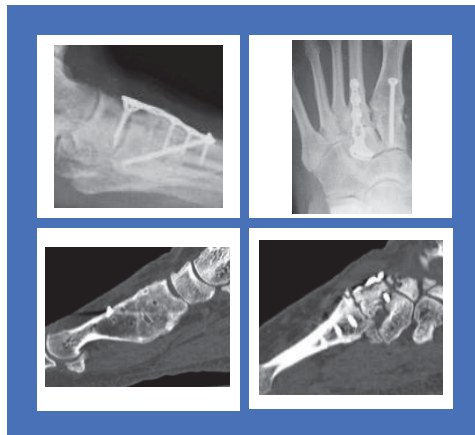
4 weeks po,
infection resolved



8 weeks PO



6 months PO



2 years PO

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Effect of Fixation Type and Bone Graft on Tarsometatarsal Fusion

Matteo Buda, MD^{1,2}, Noortje Catharina Hagemeljer, MD¹, Shaun Kink, MD³, Anne Holly Johnson, MD³, Daniel Guss, MD, MBA and Christopher William DiGiovanni, MD³

- **Purpose:** Determine whether nonunion rates after TMT arthrodesis were influenced by either the use of screw vs plate fixation or the addition of bone graft vs no bone graft.
- **Methods:**
- Eighty-eight patients (88 feet, mean follow-up: 75.1 ± 51.4; range, 12–179)
- 189 joints
- 9 different surgeons with arthrodesis

Results: Ten patients (11.4%) developed radiographic nonunion involving a total of 17 TMT joints involved

- 11 (16.4%) were fixed with only bridge plating
- 5 (4.8%) with screws only
- 1 (5.9%) with a hybrid construct

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- 34 (38.6%) had a postoperative complication
 - 14 painful hardware
 - 9 developed adjacent joint arthritis
 - 3 hardware loosening
 - 3 delayed wound healing
 - 1 developed a deep infection
- Thirty-one patients (35.2%) underwent a second operation
- 9 of these reoperation patients (29%) underwent a revision procedure for symptomatic nonunion
- Hardware loosening (2 patients, 6%), painful hardware (14 patients, 45%), adjacent joint arthritis (4 patients, 13%), irrigation and debridement for deep infection (1 patient, 3%), and delayed wound healing (1 patient, 3%)

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- Autologous bone grafting (harvested from iliac crest or tibia or calcaneus) was used in 70 feet (79.6%)
- Significantly reduced the risk of nonunion

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- **Conclusion:** “Isolated plate fixation, smoking, and postoperative nonanatomic alignment appear to significantly increase the rate of nonunion among patients undergoing TMT arthrodesis for midfoot arthritis.”
- “Concomitant use of autogenous bone graft significantly decreased this risk”

Surgery #3



- Revision 2-TMT with Trephine preparation and calcaneal autograft and plating



The Journal of Foot & Ankle Surgery 51 (2012) 168–171

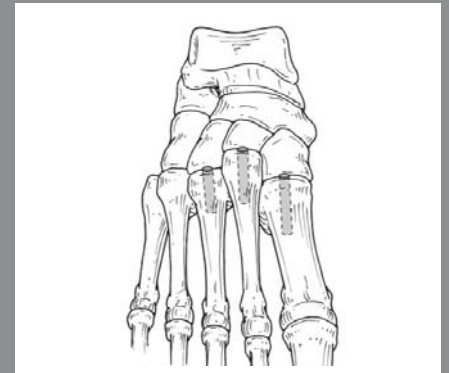
Average Depth of Tarsometatarsal Joint for Trephine Arthrodesis

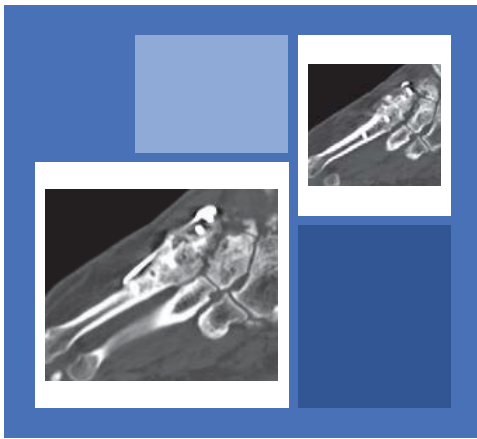
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- Cadaveric study to examine the joint depth of the Lisfranc complex was undertaken
- 51 limbs were evaluated for the depth of the first, second, and third metatarsal-cuneiform joints. The average joint



Metatarsal joint and distal tarsal depth			
Depth	First MC	Second MC	Third MC
Avg (mm)	22.3	20.9	21.8
Distal (mm)	1.7	1.5	1





2 Months
PO



6 Months
PO



Take Home Points

- Autologous grafting
- Fixation Construct

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Thank You!