FRONTAL PLANE ROTATION OF THE 1ST METATARSAL IN RELATION TO ARCH HEIGHT
Disclosure

- W. Bret Smith, DO
  - Disclosure is in the Final AOFAS Program Book.
  - We have a potential conflict with this presentation due to:
    - Treace Medical Concepts, Inc.

- Will Melton, MD
  - None

- Jaynesh Patel, PhD
  - None
Overview

- Evaluate the potential effect of arch height on frontal plane rotation of the 1st metatarsal
- Evaluate arch height impact on the hallux valgus deformities
Methods

- 50 patients
- Single orthopedic foot subspecialty clinic
- 4 radiographs for all patients
  - 3 weight-bearing images: AP, Lateral, Oblique
  - Additional Weight-bearing sesamoid axial view
    - Special foot holding device for standardization
- Reviewed by 2 fellowship trained F&A specialists
  - Uniform software with uniform points of measurement
  - Noted intra-observer reliability
Exclusion criteria

- Prior surgery on the first metatarsal
- Prior surgeries that may affect arch height
- Primary complaint not related to bunion
  - No Arch related complaints
  - Lesser toe complaints accepted
- Skeletal immaturity
Measurements

- Hallux Valgus
  - HVA
  - IM
  - DMA
- Sesamoid Rotation
Measurements

- Arch Height
  - Meary’s angle
  - Talonavicular Uncoverage
    - Talocalcaneal angle
    - Lateral Talocalcaneal angle
  - Medial Cuneiform Arch height
  - Navicular height
Statistical Analysis

- Arch height: Normal, Planus, Cavus
- Frontal Plane Rotation: rotated, rotated-subluxed, subluxed, normal
- HAV Severity: mild, moderate, severe
- Pearson’s Correlation Coefficient with significant correlations noted in graphs for Overall, Normal, Planus and Cavus feet
Sesamoid Conclusion

- No significant correlation with sesamoid rotation and hallux valgus measurements

- Re-think correction of hallux valgus measurements in overall treatment of hallux valgus with sesamoid rotation?
Arch Height Conclusions

- No correlation between arch height and sesamoid rotation
- No correlation between arch height and Hallux Valgus measurements

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Overview revisited

- Evaluate the potential effect of arch height on frontal plane rotation of the 1st metatarsal
  - No significant correlation

- Evaluate arch height impact on the hallux valgus deformities
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Selected References

- DiGiovanni CW. Foot and Ankle, Core Knowledge in Orthopedics. C.V Mosby. (2007)