Base opening wedge (BOW) osteotomies for HAV correction: Does it increase the length of the 1st metatarsal?

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Disclosures

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My disclosure is in the Final AOFAS Program Book. I have no potential conflicts with this presentation.
Objective

To determine if the 1st metatarsal base opening wedge (BOW) osteotomy significantly increases the length of the 1st metatarsal.

To determine if the medial column changed length as a result of the BOW osteotomy by using the 1st metatarsal to medial cuneiform distance.
Methods

- 100 consecutive patients were reviewed that underwent a 1st metatarsal BOW procedure
- 77 of 100 patients were included in the study
- All procedures performed by a single foot and ankle surgeon
- All patients were followed to completion of healing with final x-rays completed prior to discharge
Methods

- All radiographs were completed at the same institution using a standardized protocol.
- Each radiograph series was reviewed and measured by 2 different foot and ankle surgeons using a pre-establish measuring criteria.
- Patient exclusion criteria:
  - incomplete x-ray series, additional procedure performed on the 1st ray or medial cuneiform, proximal osteotomy of the 1st metatarsal not used to correct HAV deformity.
Measurement technique

1st MT length: Pre-op

1st MT-MC: Pre-op
Measurement Technique

1\textsuperscript{st} Length: Post-op

1\textsuperscript{st} MT-MC: Post-op
Results

- Mean 1st MT length:
  - Pre-op: 62.5mm
  - Post-op: 63mm
  - Difference: 0.4mm

- Median 1st MT length:
  - Pre-op: 62.7mm
  - Post-op: 62.6mm
  - Difference: 0.7mm
  - T-stat: 1.4
  - P-value: 0.1529

- Mean 1st MT-MC length:
  - Pre-op: 88.4mm
  - Post-op: 89.2mm
  - Difference: 0.8mm

- Median 1st MT-MC length:
  - Pre-op: 89.2mm
  - Post-op: 89.3mm
  - Difference: 1.0mm
Conclusion

- The pre-operative and post-operative measurements (1st MT) are statistically equivalent to within 0.4 standard deviations of the difference in measures.
- That is, they are equivalent if we assume that measurements are not different unless they are at least longer/shorter than 1mm.
- This test had 87% power to declare equivalence.
- We have shown that BOW osteotomies of the 1st MT do not increase the length of the 1st MT.
References


Shurnas PS, Watson TS, Crislip TW. Proximal first metatarsal opening wedge osteotomy with a low profile plate. Foot Ankle Int. 2009 Sep;30(9):865-72.


