Comparison of two operative techniques for total ankle arthroplasty: intramedullary referencing vs CT scan-derived patient-specific guides

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Disclosure

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Shawn Werner, MD: no disclosures

Michael Brage, MD: consultant for Wright Medical INC, Extremity Medical, Stryker, and Osteomed

Our disclosures are in the final AOFAS Mobile App.
Comparison of two operative techniques for total ankle arthroplasty

- Preop navigation and patient-specific instrumentation has many theoretical benefits in total ankle arthroplasty

I. Decreased surgical time
II. Improved implant alignment
III. Decreased surgical complexity
IV. Decreased fluoroscopy exposure

- No study has compared the two techniques
Methods

One surgeon utilizing two operative techniques

- Intra-medullary referencing
  - INBONE II, Wright Medical Technology Memphis TN
- CT scan derived patient specific guide
  - PROPHECY, Wright Medical Technology Memphis TN

74 TAAs performed between 2011-2013

- 65 INBONE II
  - 8 without any additional procedures at time of TAA
  - 25 without additional bone procedures
- 9 PROPHECY
  - 4 without additional procedures at time of TAA
  - 8 without additional bone procedures
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- **Results**
  - **Demographics**
    - Average age 62.7
    - 38 M, 35 F
  - **Reason for TAA**
    - Osteoarthritis: 34
    - Post-traumatic arthritis: 33
    - Rheumatoid Arthritis: 4
    - Failed Fusion: 3
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- Comparison of ALL PROPHECY vs INBONE II did not show statistically significant difference between:
  - Surgical or Tourniquet time

- Comparison of ALL PROPHECY vs INBONE II showed statistical significance for fluoroscopy exposure
  - Decreased fluoroscopy shots (30 vs 38, p-value 0.01)
  - However, there were more additional procedures in the INBONE II vs PROPHECY group

- Comparison of cases without additional bone procedures, requiring fluoroscopy, showed no statistical difference between the two groups
  - INBONE 32.8 shots; PROPHECY 29.1 shots. P-value 0.21
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Additional Procedures performed at time of TAA

- Midfoot or subtalar fusion
- Tendon procedure
- Osteotomy
- Hardware removal
- Fusion takedown
- Exostosis excision

Comparison: INBONE II vs. PROPHECY
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Procedure Time for TAA

AVG Surgical T (mins)  AVG Tourniquet T (mins)

*denotes case without additional procedures (INBONE 8, PROPHECY 4)
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*denotes case without additional bone procedures requiring fluoroscopy (INBONE 25 vs PROPHECY 8)
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CONCLUSIONS

- Intra-medullary referencing and CT scan-derived patient specific guides have similar surgical times and fluoroscopy exposure
- More research is warranted
  - Larger population size
  - Component alignment comparison
  - Track surgical time and fluoroscopy data as surgeon experience increases with patient-specific guide
References


