Total Ankle Arthroplasty Updates

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Agenda

1. Outpatient TAA (OTAA)
2. Arthrodesis vs TAA
3. Arthrodesis conversion to TAA
4. Patient specific instrumentation in TAA
5. Lessons learned
6. Q&A
No relevant disclosures

1. Outpatient Total Ankle Arthroplasty (OTAA)

Four levels of analysis on 36 patients:
1. Cost difference between OTAA and ITAA
2. Short-term outcomes and satisfaction between the two
3. Patient selection
4. Feasibility
1.1 Cost difference

- Cost was calculated based on the sum of the costs of all charge codes for a particular patient and “time & team” charges
- Savings are likely underestimated due to the study’s abnormally high surgery center costs
- OTAA produces savings of 13.4% compared to ITAA
- This correlates to roughly $2500 per case

1.2 Short Term Outcomes and Satisfaction

OTAA
- No conversions to inpatients
- One ED visit for post-operative urinary retention
- 71% satisfaction
  - Half of dissatisfied patients cited pain control
  - Others cited social issues, such as long rides home and difficulty ambulating

ITAA
- No difference in blood loss or time of surgery
- One deep infection
- 93% satisfaction

1.3 Patient selection

- No objective criteria were identified for selecting the “right” OTAA patient
- Preoperative patient screening must include:
  - Assessment of comorbidities
  - Need for assistance with daily activities
  - Presence of support at home for postoperative care
  - Surgeon and patient should arrive at a shared decision
1.4 Feasibility

- Expertly performed long-acting regional blocks are vital to prevent postoperative ED visits and/or admissions
- Single-shot popliteal and saphenous nerve blocks adequate, but indwelling catheters potentially better
- Expert perioperative nurses familiar with postoperative orthopaedic foot and ankle issues that follow up with patients the morning after their surgery
- Facilitates patient adjustment and analgesia
- In the absence of this multidisciplinary, OTAA might not be the right answer
- Consider capabilities of surgeon and facilities before offering OTAA

1. OTAA contd.

- 81 patients over 42-month period
- Only statistical difference was in amount of complications
  - 31% in ITAA
  - 5% in OTAA
  - Virtually all were superficial wound complications
- No difference in VAS or need for narcotic refills

1. OTAA contd.

- No readmissions or ED visits for postoperative pain
- 15.4% overall complication rate
- 1.5% wound complication rate
- 1.5% infection rate
- 3% revision surgery rate
2. Ankle Arthrodesis vs TAA

2. AA vs TAA contd.

Biomechanical advantages of TAA
• Faster walking speed
• Increased forefoot sagittal ROM, especially in dorsiflexion
• Increased hindfoot sagittal motion, especially in dorsiflexion
• Stronger ankle plantarflexion power due to preserved achilles function

2. AA vs TAA contd.

• Biomechanically, TAA and AA are not similar to the control group, but TAA is superior
• There is a possible paradigm shift in the understanding of the interplay of ankle & foot motion underway
  • Series of gears, rather than independent joints capable of compensation
• Ankle dorsiflexion was severely decreased in AA, resulting in limited forefoot dorsiflexion as well
• Implications for surgical planning when evaluating adjacent joint osteoarthritis?
2. AA vs TAA contd.

- Arthroplasty is typically considered a motion-sparing procedure
- Derived from large joint arthroplasty literature
- However, TAA is a viable option to AA in patients with little preoperative sagittal ROM

2. AA vs TAA contd.

- Continued push to expand the indications for TAA over AA
- End-stage OA with accompanying cavovarus foot or hindfoot varus deformity has a variable incidence of 9% - 52%
- Degree of allowable varus deformity for TAA controversial
- Residual deformity can result in instability and progressive edge-loading or subluxation of the bearing, leading to arthroplasty failure
2. AA vs TAA contd.

- Marked cavovarus/varus deformity can be treated with TAA
- Should include concomitant corrective calcaneal and metatarsal osteotomies to restore coronal plane alignment
- AA remains *gold standard* as no long-term follow-up data is available

3. Ankle Arthrodesis Conversion to TAA
3. AA to TAA contd.

- Conversion of AA to TAA remains controversial.
- Indications are symptomatic adjacent hindfoot arthritis or a symptomatic nonunion.
- Long-term follow-up studies have not been published.

Pain relief and improved function is achieved in the majority of patients.
- Concomitant procedures such as prophylactic malleolar fixation are frequently required.
- Higher rate of complications, particularly talar component settling and migration, compared to primary TAA.
- Previous distal fibulectomy as part of ankle arthrodesis is a contraindication to conversion to TAA.
4. Patient Specific Instrumentation contd.

- Implant survivorship is dependent on accuracy of implantation and successful soft tissue balancing.
- Can patient specific instrumentation increase accuracy and reproducibility of implant position?
- Multicenter, multisurgeon retrospective analysis.

4. Patient Specific Instrumentation contd.

- Patient specific instrumentation provides reliable and reproducible alignment.
- Superiority to standard instrumentation not shown.
- Likely most valuable in post-traumatic arthritis with severe deformity and revision arthroplasty cases.
- No long-term data comparing functional and operative outcomes to standard instrumentation exists.

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Table 2: Non-Sterile Exposure (NSE) in Patients with Post-traumatic and Postoperative Graft Loss During Surgery and Postoperative Graft Loss During Follow-up.

<table>
<thead>
<tr>
<th>Measure (mm)</th>
<th>Range Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative measurement</td>
<td>16 (10)</td>
</tr>
<tr>
<td>Postoperative measurement</td>
<td>18 (15)</td>
</tr>
<tr>
<td>Postoperative final alignment</td>
<td>24 (17)</td>
</tr>
</tbody>
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5. Lessons Learned

- Insufficiently balanced ankles may lead to pain after TAA
- Corrective, supramalleolar osteotomies may be a reliable treatment for correcting varus misaligned tibial components
- May spare the patient and surgeon of complicated revision surgery
- Gutter debridement of utmost import

5. Lessons Learned contd.

- Continuous infusion saphenous and popliteal nerve blocks work better than single shot block
- Significantly decreases opioid use on POD 1, and greater satisfaction with pain up until POD 3, at which point the catheter is pulled
Thank you!