ANALYSIS OF TOTAL ANKLE ARTHROPLASTY SURVIVAL IN THE UNITED STATES

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Disclosures/Conflicts of Interest

- **Title:** Analysis of Total Ankle Arthroplasty Survival in the United States
- Disclosures are in the Final AOFAS Mobile App.
- Presenters
  - J. LaMothe, C. Seaworth, H. Do, J. Burket
    - No potential conflicts with this presentation
  - S.J. Ellis
    - Paid teaching for Integra and consultant for Treace Medical Concepts
Background

• Ankle arthroplasty is becoming more common (Sing et al., 2010)

• Nationwide registries are good for tracking implant performance, survivorship, patient morbidity/mortality, and healthcare economics

• Few countries have nationwide ankle arthroplasty registries (Labek et al., 2013)
  – There is no nationwide ankle arthroplasty registry in the United States
    • However, there are large nationwide databases that cover most inpatient admissions

• **Purpose:** To evaluate the recent survivorship and failure of ankle arthroplasty in the United States using large multipayer multistate databases
Study Design

• Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases were used
  – Used ICD-9 diagnostic and procedural codes
  – Benefits
    • Multiple payers and states
    • Largest all-payer inpatient care databases in the United States
      – 47 states
      – 97% of all US hospital discharges
  – States with 5-year continuous revisit data (2004-2009) were used
    • NY, CA, FL, NE, NC, UT
Study Design Cont’d

• Data Elements Extracted
  – **Demographics**: age, sex, race, length of stay, death, disposition, readmission
  – **Procedure-related**: procedure state, year, bilateralism
  – **Patient-related comorbidity**: Inflammatory arthropathy, diabetes, obesity, Charlson-Deyo score

• Multivariate Logistic Regression Model Analyses For:
  – Readmission within 90 days
  – Failure as defined as: arthroplasty revision, removal, ankle arthrodesis, amputation
Patient Demographics

n=1545 with 1593 TAA between 2005-2009

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>mean=62.8 yr</td>
</tr>
<tr>
<td>Sex</td>
<td>54.3% Female</td>
</tr>
<tr>
<td>Charlson-Deyo Comorbidity Score</td>
<td>mean=0.43</td>
</tr>
<tr>
<td>Follow-up</td>
<td>mean=22.5 mo</td>
</tr>
</tbody>
</table>

Etiology

- 55.2% OA
- 30.2% Post-Traumatic
- 6.2% RA
- 8.4% Other

OA: Osteoarthritis
3 year survival = 95.8%
5 year survival = 91.1%
• Failure procedures: Average of 11.8 months
  – Revision (n=36)
  – Fusion (n=22)
  – Removal (n=9)
  – Amputation (n=5)

• Etiology
  – *RA*: Odds Ratio=2.18 (95% CI: 1.05-4.54)
  – *OA/Trauma/Other*: No significance

• Readmission within 90 days after index arthroplasty
  – Odds Ratio=3.41 (95% CI: 1.67-6.97)
90-Day Readmission

• Charlson-Deyo Score
  – 2: Odds Ratio=3.05 (95% CI 1.51-6.15)
  – ≥3: Odds Ratio=3.16 (95% CI 1.29-7.77)

• Length of Stay during TAA Admission
  – OR=1.30 (95% CI: 1.16-1.47)

• No Significant Difference in Failure or Readmission (Multivariate Analyses) For:
  – Patient Factors
    • Age, Sex, Race, Diabetes, Obesity
  – Heath System
    • Healthcare Payer, Patient Disposition
  – Surgical Factors
    • Unilateral/Bilateral, Year, State of Surgery
Limitations

- **Follow-up**
  - Time-frame
    - Analysis limited only to states with $\geq 5$ year continuous follow-up
  - Location based
    - Patients seeking treatment outside of index states would be lost to follow-up

- **Coding**
  - Etiology of arthritis based on coding records
  - What is coded as a revision?
    - Wide variety of procedures from simple gutter debridement to complex two stage revision could be coded as revisions
Summary

• This is the first study to use the largest nationwide multi-payer multi-state patient database to examine total ankle arthroplasty survival in the United States
• 5-year survival = 91.1%
• Factors associated with increased failure
  – RA
  – 90-day readmission
• Factors associated with 90-day readmission
  – Charlson-Deyo score >2
  – Increased length of stay during index procedure
References
