A comparison of adjacent joint arthrodesis rate in arthroscopic and open technique of ankle arthrodesis: A database analysis.

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NO CONFLICT TO DISCLOSE

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My disclosure is in the Final AOFAS Mobile App.

I have no potential conflicts with this presentation.
Introduction

Arthrodesis is the gold standard for end stage ankle arthrosis not responsive to therapy\textsuperscript{9}, and is often preferred to arthroplasty in more active populations.\textsuperscript{1-3,10}

Major complication of ankle arthrodesis: adjacent joint arthritis.

- Open ankle arthrodesis is associated with substantial arthritic change and deficits in functional outcome in the ipsilateral foot\textsuperscript{7-8}.
- Retrospective studies show this sequale of adjacent joint arthrosis is associated with both techniques\textsuperscript{11}.

The purpose of the current study was to evaluate and compare trends in ankle arthrodesis procedures (arthroscopic and open), as well as to analyze the rate of patients undergoing subsequent adjacent joint arthrodessis procedures in the United States (U.S.).
Methods

A PearlDiver Patient Record Database analysis (2005-2011)

- PearlDiver is Health Insurance Portability and Accountability Act compliant national database compiled from a collection of the Medicare MEDPAR dataset and the United Healthcare Orthopedic Dataset (UHC)

Patient type – underwent ankle arthrodesis (arthroscopic or open), subsequent midfoot or hindfoot procedures (e.g. midtarsal fusion, pantalar fusion, subtalar fusion)

Search performed by searching Current Procedural Codes (CPT).
Results

The yearly incidence of open ankle arthrodesis significantly increased by 27.1% when comparing 2007 to 2010 (P < .05) and was most commonly performed in 2010 with 0.44 cases per 10,000 people (Figure 2).
Results

- 5.1 % (431/8474) received subsequent arthrodesis (mid-foot, hind-foot) index ankle fusion (open or arthroscopic).
  - 93% (401/431) index procedure – *open* arthrodesis
  - 7.0% (30/431) index procedure – *arthroscopic* arthrodesis (p=<0.001)

- 3.5% (297/8474) received subsequent subtalar arthrodesis
  - 95% (282/297) index procedure – *open* arthrodesis
  - 5.0% (15/297) index procedure – *arthroscopic* arthrodesis (p=<0.001)
Results

Percentage of Subsequent Adjacent Joint Arthrodesis of the Subtalar Joint and Midfoot/Hindfoot after Index Arthroscopic or Open Arthrodesis

- Subtalar Arthrodesis: 95.00% Arthroscopic, 5.00% Open
- Midfoot/Hindfoot Fusion: 93.00% Arthroscopic, 7.00% Open
Results

- Index arthroscopic arthrodesis were *less likely* to have a subsequent mid-foot and or hind-foot arthrodesis compared to index open ankle arthrodesis (OR=0.46; 95%CI: 0.32-0.67; P<0.0001).

- Index arthroscopic arthrodesis were *less likely* to go on to have a subtalar arthrodesis than index open ankle arthrodesis (OR: 0.33; 95%CI: 0.19-0.56; P<.0001).

<table>
<thead>
<tr>
<th>Table 6. Odds Ratios of Adjacent Joint Arthrodesis Subsequent to Open or Arthroscopic Ankle Arthrodesis</th>
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</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>Midfoot/Hindfoot</td>
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<tr>
<td>P value</td>
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<td>Index Procedure (Arthroscopic vs. Open)</td>
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</tbody>
</table>
Discussion

- 5.1% of arthrodesis patients underwent a subsequent fusion of the mid-foot and/or hindfoot within a 7 year period.

- The arthroscopic technique was associated with a lower rate and lower odds ratio of adjacent joint arthrodesis, specifically of the subtalar joint.

- Previous studies have suggested that the relationship between adjacent joint deterioration and ankle joint fusion is inevitable\(^{12}\) or may not be a causative one\(^{11}\).
Discussion

Adjacent joint damage due to:
- Increased motion in adjacent joints
- Abnormal chronic loading of other joints

Biological advantages of arthroscopic procedure:
- minimum degree of soft-tissue envelope disruption
- reduce the degree of permanent functional impairment of the joints and soft tissues adjacent to the arthrodesis site.
- rapid activation of the bone-healing cascade leading earlier functional improvement.
Conclusion

While open ankle arthrodesis is more commonly performed than arthroscopic arthrodesis, it is associated with a higher rate of subsequent adjacent joint arthrodesis. The factors that may potentiate these subsequent procedures should be further investigated.
References