Nonunion risk factors in foot and ankle arthrodesis surgery: A Survey of international orthopaedic foot and ankle surgeons

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Nonunion risk factors in foot and ankle arthrodesis surgery: A Survey of international orthopaedic foot and ankle surgeons

Gowreeson Thevendran

My disclosure is in the Final AOFAS Program Book. I have no potential conflicts with this presentation.
Risk Factors for Nonunion in Arthrodesis Surgery: A Survey of International Orthopaedic Foot and Ankle Surgeons
Gowreeson Thevendran, Kalpesh Shah, Alastair Younger, Stephen J Pinney
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- An online questionnaire based survey
- Editorial board of Foot & Ankle International (FAI), BOFAS, IFFAS, COFAS and the Australian Orthopaedic Foot & Ankle Society (n=140)
- 72% response rate
- 3 questions with a stemmed question 2
Question 1: What percentage of your current practice is foot and ankle surgery?
Current Practice Trends (2) – Survey Outline

*Question 2*: Can you rate what you believe the risk of non-union associated with each of the factors below from 0 = "no-risk" to 10 = "highest risk"

(As a benchmark we would consider a 1 pack per day smoker to be equal to a 5/10).
### Results: Survey – Risk Factor Stratification

**Table 1: Risk Factor Groups that are More Significant than smoking 1 pack/day (≥ 5/10) p < 0.001**

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Mean Score</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker of 2 pack/day</td>
<td>8.69</td>
<td>1.47</td>
</tr>
<tr>
<td>Lack of fusion site stability</td>
<td>8.66</td>
<td>1.34</td>
</tr>
<tr>
<td>Poor local vascularity</td>
<td>7.66</td>
<td>2.01</td>
</tr>
<tr>
<td>Poor compliance with WB</td>
<td>7.45</td>
<td>2.10</td>
</tr>
<tr>
<td>Gaps at the fusion site</td>
<td>7.40</td>
<td>2.19</td>
</tr>
<tr>
<td>Poor soft tissue envelope</td>
<td>6.78</td>
<td>2.18</td>
</tr>
<tr>
<td>Diabetes with HBA1C &gt; 8</td>
<td>6.76</td>
<td>2.18</td>
</tr>
</tbody>
</table>
Results: Survey – Risk Factor Stratification

Table 3: Risk Factors Groups that are *No Different* from smoking 1 pack/day (*p > 0.001*)

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Mean Score</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokeless tobacco</td>
<td>5.90</td>
<td>2.52</td>
</tr>
<tr>
<td>Smoker of half pack/day</td>
<td>5.63</td>
<td>2.07</td>
</tr>
<tr>
<td>Obesity with BMI &gt; 40</td>
<td>5.54</td>
<td>2.46</td>
</tr>
<tr>
<td>Local infection</td>
<td>4.92</td>
<td>2.58</td>
</tr>
<tr>
<td>Diabetes with HBA1c between 6 - 8</td>
<td>4.53</td>
<td>2.03</td>
</tr>
<tr>
<td>Obesity with BMI 30-40</td>
<td>4.16</td>
<td>2.39</td>
</tr>
</tbody>
</table>
### Table 2: Risk Factor Groups that are *Less Significant* than smoking 1 pack/day (&lt;5/10) \( p < 0.001 \)

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Mean Score</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 60</td>
<td>2.54</td>
<td>1.90</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>3.05</td>
<td>2.36</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>3.56</td>
<td>2.34</td>
</tr>
<tr>
<td>Age &gt; 80</td>
<td>3.80</td>
<td>2.39</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>4.05</td>
<td>2.45</td>
</tr>
</tbody>
</table>
Current Practice Trends (40) – Survey Results

**Question 3**: Please state which, if any, risk factor is an absolute contraindication to arthrodesis surgery in the foot and ankle
Absolute contraindications: Proportion of responses

- Smoking: 28%
- Infection: 26%
- Vascularity: 24%
- Others: 8%

Non-compliant patient, diabetes, charcoal, neuropathy, death
Current Practice Trends (42) – Survey Results

**Geographical Variation**

Geographical variation in response rates

- British Orthopaedic Foot & Ankle Society (BOFAS) 14/19 – 74%
- Canadian Orthopaedic Foot & Ankle Society (COFAS) 6/8 – 75%
- International Federation of Foot & Ankle Surgeons (IFFAS) 7/11 – 64%
- Australian Orthopaedic Foot & Ankle Society (AOFAS) 6/7 – 86%
- Editorial Committee of *Foot & Ankle Intl* – 63/94 – 67%
Current Practice Trends (44) – Survey Results

Geographical Variation

- Comparable response rate from the North American experts and worldwide experts
- No significant difference in risk stratification between the North American experts and worldwide experts
References

27. Gaston MS, Simpson AHRW. Inhibition of fracture healing. J Bone Joint Surgery (2007); Vol 89-B : 12; 1553-1560