THE ROLE OF MSC IN HIGH RISK FOOT AND ANKLE RECONSTRUCTION

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Disclosure

The role of MSC in high risk foot and ankle reconstruction

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Our disclosures are in the Final AOFAS Program Book. There is a potential conflict with this presentation due to: Consultant, Nuvasive (CFH). This study was partially funded by a grant from Nuvasive.
Purpose of Study

• Is the use of MSC an alternative to autograft in high risk patients undergoing foot and ankle fusion?

  – Diabetics
  – Smokers
  – Vasculo-paths
  – High BMI
Materials and Methods

• IRB Approved
• Retrospective radiographic review
  – 2.5 yrs duration
  – 1 surgeon
• Weightbearing Xrays
  – Pre / Post op foot and ankle
• Fusion = 3 cortices
• 33 subtalar
• 18 talonavicular
• 12 ankle
• 2 calcaneocuboid
  – 37 primary
  – 3 revisions
Demographics

- 40 patients
  - 20 male, 20 female
- Age
  - $59.5 \pm 12.1$ years (29 – 80)
- BMI
  - $34.21 \pm 8.45$ (21.76 – 52.9)
## Time to fusion (weeks)

<table>
<thead>
<tr>
<th>Group</th>
<th>Smokers</th>
<th>Diabetics</th>
<th>BMI &lt; 25</th>
<th>BMI 25 - 30</th>
<th>BMI &gt; 30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PWB</strong></td>
<td>5.71 ± 1.94</td>
<td>6.09 ± 2.64</td>
<td>7.09 ± 2.94</td>
<td>5.6 ± 0.8</td>
<td>5.73 ± 2.05</td>
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<tr>
<td><strong>FWB</strong></td>
<td>8.83 ± 2.1</td>
<td>9.09 ± 2.91</td>
<td>10.73 ± 2.56</td>
<td>8.8 ± 1.33</td>
<td>8.83 ± 2.2</td>
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<tr>
<td><strong>Shoe gear</strong></td>
<td>12.02 ± 3.30</td>
<td>12.36 ± 3.84</td>
<td>15.27 ± 2.34</td>
<td>11.2 ± 1.85</td>
<td>12.11 ± 3.29</td>
</tr>
<tr>
<td><strong>Union</strong></td>
<td>11.74 ± 1.86</td>
<td>11.91 ± 1.81</td>
<td>12.70 ± 2.05</td>
<td>11.4 ± 1.36</td>
<td>11.77 ± 2.42</td>
</tr>
</tbody>
</table>
Fusion Rate

• 38/40 patients went onto fusion

• 2 patients went onto fusion following revision surgery
Conclusion

• Historically, nonunion rate 0 to 40%

• Autograft carries risks

• Role of allograft MSC
  – 95% fusion rate @ 12 weeks
References

- Tsiridis E, Upadhyay N, Giannoudis P. Molecular aspects of fracture healing: Which are the important molecules? Injury. 2007; 3851: 511-525.
- Qi Y, Zhao T, Xu K, Dai T, Yan W. The restoration of full-thickness cartilage defects with mesenchymal stem cells (MSCs) loaded and cross-linked bilayer collagen scaffolds on rabbit model. Mol Biol Rep. Published online 19 May 2011.