The use of an Acellular Collagen Matrix to Treat Chronic Ulcerations of the Midfoot associated with Charcot Neuroarthropathy

Steven J. Kavros, DPM
Mayo Clinic, Rochester, Minnesota, United States of America

Background

Charcot arthropathy is a complex disease encompassing foot deformity, ulceration, and associated with Charcot neuroarthropathy were not uncommon. Limb salvage then becomes a necessary element of treatment, and is the primary goal of this study. The use of a new biomaterial in PriMatrix may greatly enhance the outcomes in patient care. Early recognition and timely treatment with other therapies can greatly improve the outcome of patients with Charcot neuroarthropathy.

Methods

Twenty patients with ulcerations of the midfoot associated with Charcot neuroarthropathy were included in this study. The study compared PriMatrix (Acellular Collagen Matrix) for use in addition to standard of care with wound care for control and PriMatrix values were compared with baseline differences in demography and risk factors (diabetes, neuropathy, renal disease). All patients had chronic, non-Healing neuropathic ulcerations prior to development of Charcot arthropathy in the setting of neuropathic ulceration prior to Charcot. Healing neuropathic ulceration prior to Charcot neuroarthropathy is a significant outcome of the disease. The use of PriMatrix may greatly improve the outcomes in patient care. Early recognition and timely treatment with other therapies can greatly improve the outcome of patients with Charcot neuroarthropathy.

Results

Initial Wound Volumes (mm³): By Category

<table>
<thead>
<tr>
<th>Category</th>
<th>PriMatrix Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot Ulceration</td>
<td>10 (83%)</td>
<td>7 (88%)</td>
</tr>
<tr>
<td>Wound Volume</td>
<td>68 (64.4-70.7)</td>
<td>70 (65.7-72.3)</td>
</tr>
</tbody>
</table>

Healing rate of PriMatrix vs. Control, p<0.0001

Table 1

 PriMatrix Characteristics

- Processed to preserve the native fetal collagen
- Type I collagen and Type III collagen
- CD34+ circulating cells were found sequestered in PriMatrix
- Vascular Endothelial Growth Factor (VEGF) bind to PriMatrix
- Within minutes, a fibrin provisional matrix implant composition
- During implantation the porous matrix soaks with blood, immediately altering the actual implant composition

PriMatrix application in excisional wound: 2 weeks

Wound Volume: % reduction

Table 2

Wound Volume Reduction: mm³/week

<table>
<thead>
<tr>
<th>Category</th>
<th>PriMatrix Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot Ulceration</td>
<td>10 (83%)</td>
<td>7 (88%)</td>
</tr>
<tr>
<td>Wound Volume</td>
<td>68 (64.4-70.7)</td>
<td>70 (65.7-72.3)</td>
</tr>
</tbody>
</table>

Healing rate of PriMatrix vs. Control, p<0.0001

Conclusions

The use of an Acellular Collagen Matrix to Treat Chronic Ulcerations of the Midfoot associated with Charcot Neuroarthropathy is warranted. The healing impact of PriMatrix on neuropathic ulcerations is warranted. The use of PriMatrix may greatly improve the outcomes in patient care. Early recognition and timely treatment with other therapies can greatly improve the outcome of patients with Charcot neuroarthropathy.