Single use negative pressure therapy following surgical debridement of a diabetic foot ulcer

Introduction

The PICO™ single use Negative Pressure Wound therapy (NPWT) system is a new simplified approach to the delivery of NPWT. The system is intended to combine the therapeutic benefits associated with NPWT with the simplicity of application of an advanced wound care dressing for small to medium size wounds with low to moderate levels of exudates. Unlike conventional NPWT systems the PICO system requires no exudate collection canister owing to the unique nature of the dressing used. Rather than being collected within a canister, exudate is instead drawn under negative pressure into the body of the PICO dressing and is subsequently dispersed as vapour via the dressing upper film. The absence of an exudate canister means that the PICO device is extremely small in comparison to canister-based NPWT systems. The small size of the PICO device coupled with the systems inherent simplicity of use raises the possibility that it could allow NPWT to be used amongst patients for whom conventional canister-based NPWT would be ill-suited.

Results

Day 5

After five days of NPWT with the PICO system the condition of the wound had improved with healthy granulation tissue now comprising the greatest proportion of the wound bed (see Figure 5). The system also coped well with the moderate level of exudate being produced by the wound managing it effectively and maintaining the condition of the per-wound skin. Following the five days of PICO therapy the wound dimensions had reduced considerably with the wound now measuring 70mm in length, 22mm wide with a depth of 5mm (wound area of 1210mm²; wound volume 4032mm³). This change in wound dimensions represented a 12% reduction in wound area and a 44% reduction in wound volume.

Table 1. Changes in wound dimensions with PICO treatment

<table>
<thead>
<tr>
<th>Day</th>
<th>Wound length</th>
<th>Wound width</th>
<th>Wound depth</th>
<th>Wound area (mm²)</th>
<th>Wound volume (mm³)</th>
<th>Reduction in wound area since PICO initiation</th>
<th>Reduction in wound volume since PICO initiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>70</td>
<td>22</td>
<td>5</td>
<td>1210</td>
<td>4032</td>
<td>12%</td>
<td>44%</td>
</tr>
<tr>
<td>12</td>
<td>70</td>
<td>16</td>
<td>2</td>
<td>1374</td>
<td>9163</td>
<td>18%</td>
<td>49%</td>
</tr>
</tbody>
</table>

Day 6

After a further seven days of NPWT the wound dimensions had reduced still further (see Figure 6). The wound length and width had now reduced to 70mm and 16mm respectively, whilst granulation had now reached the level of the surrounding skin (wound area 808mm²). With granulation tissue now filling the wound to the level of the peri-wound skin PICO NPWT was discontinued since the treatment objective had been achieved after twelve days use. Over the twelve day treatment period the wound area reduced by 36% (1374mm²/808mm²). No referral to a plastic surgeon was required.

The wound continued to progress towards healing with conventional advanced wound management and ultimately healed in a timely manner (see Figure 7 and 8).

Discussion

Throughout the period of PICO usage Mr R found the dressing comfortable to wear and the system proved easy to operate and carry. The clinician experience proved similarly positive with dressing changes proving quick and simple due to the straightforward dressing application and ease of obtaining an effective seal.

Conclusion

The small device size, simplicity of application and lower unit cost compared with conventional systems raises the possibility that PICO could make NPWT accessible to patients for whom conventional canister-based NPWT would not be appropriate or affordable.

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