Total contact casing: a case study

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Table I: Factors influencing healability in diabetic foot ulcers

<table>
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<tr>
<th>Description of factors</th>
<th>Criteria</th>
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| Adequate tissue perfusion to the     | Vascular examination:
| affected site                         | • Pedal pulses                                                           |
|                                      | • Ankle brachial pressure index                                           |
|                                      | • Transcutaneous oxymetry                                                |
|                                      | • Arteriogram                                                            |
|                                      | • Angiogram                                                              |
| The presence and management of       | General principles according to the international guidelines
| infection                             | Using the acronyms, NERDS and STONES                                     |
|                                      | Good glycaemic control                                                   |
|                                      | Haemoglobin $A_1c$ below 7%                                               |
| Regular debridement                   | The removal of devitalised tissue and the promotion of granulation tissue to prepare the wound bed for optimal healing |
| Wound management                     | The application of appropriate wound dressings according to the wound bed preparation guidelines |
| Adequate pressure redistribution      | Offloading off the plantar pressure areas (especially effective in offloading forefoot pressure) |
|                                      | Patient adherence to the treatment programme (especially effective in offloading forefoot pressure) |

NERDS: nonhealing, exudate, red friable tissue, debris and smell; STONES: size enlargement, temperature increase, os/bone exposed, new breakdown, exudate, erythema, oedema and smell.
factors that are important in establishing the healability of a diabetic foot ulcer (Table I). In the author’s opinion, wound management and patient adherence play an equally important role, as also illustrated in the newly published international best practice guidelines1 (Table I).

**Contraindications**

Absolute contraindications include:
- Active or acute deep infection, and gangrene (Wagner grades 3-5).1,2 Deep tissue infection,2,14 osteomyelitis2 and exposed tendons, joints and/or bones.
- Arterial insufficiency or gangrene.1,2

Relative contraindications include:1
- Severe obesity.
- An ulcer depth greater than the ulcer width.
- Fragile skin.
- Fluctuating oedema.
- If the patient is unwilling to have a cast on the limb.
- If the patient is unable to comply with follow-up visits or to wear precautions.
- If it is unsafe for the patient with respect to his or her mobility while in the cast.

**Wound bed preparation and total contact casing**

The aim of wound bed preparation is to create an optimal wound healing environment by producing a well vascularised, stable wound bed with little or no exudate. It is important to focus on the wound and the patient as a whole with a defined goal. Wound bed preparation was utilised in the case study that follows to facilitate wound healing.

### Case study

**Wound history**

A 46-year-old male patient with type 2 diabetes mellitus was non-insulin dependent. The patient had a history for more than one year of non-healing ulcers. A new ulceration had been present for longer than four weeks, and had been treated with Betadine®, peroxide and salt and oral antibiotics. The patient had a haemoglobin A1c of 8%. His working conditions were nonconducive to ulcer healing as he had to wear safety boots and he also worked as a part-time farmer.

Factors influencing the wound healing of the patient were:
- Type 2 diabetic mellitus.
- Oedema.
- Infection.
- Necrotic tissue.
- Mobility.
- Neuropathy.
- High plantar pressures.
- Probe to bone.

Figure 1 provides details of the initial assessment and photographs taken of the patient’s wounds on days 0 and 8 (following closure of the wound). Treatment started with an antimicrobial dressing and complete offloading with crutches until the total contact casing could be applied.

**Conclusion**

Diabetic foot ulcers remain complex, chronic wounds which have a major impact on morbidity, mortality and quality of life, as well as

### Treatment plan

<table>
<thead>
<tr>
<th>Treatment plan</th>
<th>Forefoot (day 0)</th>
<th>Plantar ulceration (day 0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debridement</td>
<td>Autolytic and sharp debridement</td>
<td></td>
</tr>
<tr>
<td>Infection or inflammation control</td>
<td>Polyhexanide® with Betaine® wound cleanser and hydrophobic ribbon gauze inbetween the toes with Alginate Ag on the wound bed as a primary dressing</td>
<td></td>
</tr>
<tr>
<td>Moisture balance and exudate management</td>
<td>Alginate with absorptive pad dressing with wool padding and crepe bandaging</td>
<td></td>
</tr>
<tr>
<td>Edge and surrounding skin</td>
<td>Cavilon™ cream to protect the skin</td>
<td></td>
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<tr>
<td>Adjunctive therapy</td>
<td>Vacumed vascular flow regeneration</td>
<td></td>
</tr>
<tr>
<td>Dressing change frequency</td>
<td>Total contact cast applied on 21 July 2014</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Every 3-4 days</td>
<td></td>
</tr>
</tbody>
</table>
socio-economic circumstances.1,2 South Africa is no different to the rest of the world and diabetic foot ulcers are being seen on a daily basis. Approximately 25% of people with diabetes develop a diabetic foot ulcer during their lives.2,7 A lower limb is amputated every 20 seconds due to diabetes complications.15 According to the evidence, up to 85% of amputations could be avoided if an effective care plan was adopted.1,2,11,12,15 It is also clear that total contact casing is the gold standard offloading method used worldwide. This article discussed a specific diabetic foot ulcer case and the management thereof by using the Bachelor of Science Nursing (BSN) Programme total contact casing system. The International Diabetes Federation recommends that a specialist footcare team should include doctors with a special interest in diabetes, people with educational skills and those with formal training in foot care; usually a diabetes podiatrist and trained nurses. This team should be enhanced by vascular surgeons, orthopaedic surgeons, infection specialists, orthotists, social workers and psychologists, in order for comprehensive care to be delivered.2 This is also true for the South African environment in which wound care specialist nurses and podiatrists often work together with a vascular surgeon in a multidisciplinary team. The BSN TCC fibreglass option provides the option of a new, lighter, more durable, washable, removable TCC. Good aeration and washability are major features of the BSN TCC system. It provides a hygienic reusable fibreglass cast with an open toe box, allowing for inspection of the toes, as well as aeration. Wound closure was achieved in this specific case study within a four-week framework by following the
wound bed preparation guideline principles and incorporating total contact casing as the method of offloading.

References