WundForum
The magazine for wound healing and wound treatment

Treatment of a tibial wound with TenderWet after an insect sting
Aspects of wound flushing
Interview: Supportive therapy with phlebologic compression bandages

Abstracts from selected articles of HARTMANN WundForum
This case report presents the treatment of a tibial wound with TenderWet after an insect sting.

A 41-year-old patient was stung by an insect on the left leg. Due to a severe dermal reaction, the patient visited a family physician on the following day (before an upcoming weekend). The insect sting was treated with antibiotics but that evening, despite this therapy, blister formation and skin changes intensified.

After the weekend, the patient went to the medical office at her place of work which found two filled blisters mediotibially on the left lower leg. The distal blister had a diameter of approximately 15 mm and the proximal blister of approximately 30 mm. Skin changes were visible for approximately 10 cm around the blisters and there was a discrete, locally limited oedema in the wound area.

The blisters were lanced, releasing a secretion of serum and coagulated blood. After ablation of the epidermal tissue, the wound dressing TenderWet 24 active was applied to the wound surfaces. After debridement, it was evident that only the epidermal and upper dermal layers were affected.

On the following day, the eczematous symptoms were clearly reduced and the base of the wound was not as severely reddened as on the previous day. The patient had almost no pain. The wound dressing TenderWet 24 active was used again for further wound care. On the following day, a further reduction in the infective changes was observed, so the dressing was changed to Hydrosorb hydrogel compress. This was left on until the end of treatment of the wound area after for eight days.

At the conclusion of treatment, both wounds were completely epithelialised. The area around the wound showed only discrete signs of eczema.
Wound flushing (or wound irrigation) is defined as the cleaning of a wound using a rinsing solution. Wound flushing removes coatings and necrosis and flushes out dirt, germs, foreign bodies, toxins and cellular debris. Theoretically, mechanical cleaning of the wound reduces the number of microorganisms, but in the presence of an infection, germs should be killed as much as possible using antiseptics.

Furthermore, wound flushing retains the moisture of a wound. In principle, wound flushing can be used in all wounds in all stages of wound healing. However, the particular procedure and the flushing solution used are considerably dependent on the site, the cause, and the degree of contamination of the wound as well as the stage of wound healing.

The ideal flushing solution should have a physiologic pH of 7.36 to 7.42. Similarly, the electrolyte content and the osmolarity should match that of plasma or extracellular fluid. Sterility of the fluid minimizes the bacterial load and colourlessness prevents staining of the wound which can make assessment difficult.

To prevent cooling of the wound, the flushing solution should be warmed and used at body temperature. The flushing solution should neither irritate the skin nor cause pain.

The authors describe the various flushing solutions and show the difference between the individual preparations. The following flushing solutions are presented in detail:

- Distilled water
- 'Physiologic' saline
- Electrolyte solutions (e.g. Ringers solution)
- Tap water
- Antiseptics (e.g. povidone-iodine, polyhexanide, octenidine)

Selection of a flushing solution is based on the age, site, and size of the wound, the bacterial colonisation, and the wound base. The indications for wound flushing are numerous, but use of antiseptics should be limited to initial wound cleansing and to infected wounds. As well as the 'classic' wound flushing, there are new techniques available such as moist therapy with TenderWet, high pressure flushing (jet lavage) and the combination of wound flushing and negative pressure therapy.

### Indications for wound flushing – when, how, and with what to flush?

<table>
<thead>
<tr>
<th>Indication</th>
<th>General considerations</th>
<th>Procedures / Flushing solutions</th>
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<tbody>
<tr>
<td>Traumatic (contaminated) wounds</td>
<td>In general a single antiseptic flush</td>
<td>Octenidine, polyhexanide, povidone-iodine</td>
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<td></td>
<td>In the presence of severe contamination</td>
<td>Supplemented with a large volume of physiologic flushing solution</td>
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<tr>
<td>Infected wounds</td>
<td>In the presence of clinical signs of infection</td>
<td>e.g. octenidine, povidone-iodine, polyhexanide: Tauroidine in combination with moist wound dressing</td>
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<td>antiseptic flushing at bandage changes</td>
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<tr>
<td></td>
<td>With strong secretion and pus formation</td>
<td>Large volume of physiologic flushing solution + polyhexanide, octenidine or povidone-iodine</td>
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<td></td>
<td>Deep wound cavities or bone and joint involvement</td>
<td>Large volume of physiologic flushing solution, in combination with polyhexanide or povidone-iodine (if necessary using VAC-Instill)</td>
</tr>
<tr>
<td>Necrosis, coatings</td>
<td>Is initial radical ablation possible?</td>
<td>Surgical debridement or jet lavage</td>
</tr>
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<td></td>
<td>Gentle ablation is essential!</td>
<td>Suction-flushing-drainage device, TenderWet (moist therapy)</td>
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<tr>
<td>Wound secretions, haematomas, loose fibrin</td>
<td>No antiseptics are indicated!</td>
<td>copious physiologic flushing solution or TenderWet (moist therapy)</td>
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<tr>
<td>Chronic wounds</td>
<td>Large flush volume is recommended</td>
<td>physiologic flushing solution or tap water</td>
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<td></td>
<td>With very painful or sensitive wounds</td>
<td>TenderWet (moist therapy)</td>
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Prof. E. Rabe (President of the German Society for Phlebology) was interviewed on the therapeutic use of and problems with phlebologic compression bandages. He was asked, among other things, about the indications and the application of phlebologic compression bandages.

Prof. Rabe provided detailed information regarding the efficacy of compression bandages and discussed considerations when applying compression bandages:

Prof. Rabe points out that compression bandages only achieve their full effectiveness in combination with active movement. A correctly applied compression bandage also gives firm support to weak leg musculature. Since a compression bandage also effectively reduces venous diameter ‘at rest’, it is in principle also indicated in immobile vein patients. However, contraindications should be considered (see table).

Compression bandages should always provide a high working pressure and a low resting pressure. A short stretch bandage provides the best therapeutic pressure characteristics. A good bandage is made of elastic fabric with short stretch and a pressure of approximately 90%, such as Pütterbinde.

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### Indications and Contraindications

#### Indications

- **Varicosis**
  - Varicose veins, primary and secondary
  - Varicose veins after pregnancy
  - Support of sclerosing therapy
  - After vein surgery

- **Thromboemboli**
  - Thrombophlebitis (superficial) and a history of healed phlebitis
  - Deep leg vein thrombosis
  - A history of thrombosis
  - Post-thrombotic syndrome
  - Thrombosis prophylaxis

- **Chronic venous insufficiency (CVI)**
  - CVI of Widmer stage I to III or CEAP class C1 to C6
  - Ulcer prevention
  - Guide vein insufficiency
  - Angioplasty

- **Oedema**
  - Lymphoedema
  - Oedema in pregnancy

- **Post-traumatic oedema**
- **Idiopathic cyclic oedema**
- **Lipo-oedema from stage II**
- **Venous stasis due to immobility** (arthrogenic congestive syndrome, paresis and partial paresis of the extremities)

#### Contraindications

- **Absolute contraindications**
  - Advanced peripheral arterial occlusive disease
  - Decompensated cardiac insufficiency
  - Phlegmasia cerulea dolens

- **Relative contraindications**
  - Severe paraesthesia of the extremities
  - Advanced peripheral neuropathy (e.g. due to diabetes mellitus)
  - Intolerance to the bandage material
  - Compensated peripheral arterial occlusive disease

**Source:** Association of the Scientific Medical Societies in Germany (AWMF) guideline ‘Phlebologic Compression Bandages’