

# The use of a new honey dressing on an infected diabetic foot ulcer

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Finding a dressing that provides an optimal wound healing environment for the patient and is also cost-effective can be a difficult process (Baranoski, 2008). This is particularly true for hard-to-heal wounds, which are associated with long duration and a high incidence of complications, often resulting in considerable quality of life and financial burdens (Romanelli et al, 2008).

Also, each year brings the launch of even more dressings, increasing the choice, but also making it harder for clinicians to decide on the optimum product.

## L-Mesitran™ Tulle

This article evaluates one of those new dressings (L-Mesitran™ Tulle; Triticum) in a clinical setting. L-Mesitran Tulle is a non-adherent polyethylene dressing impregnated with the already available L-Mesitran Soft gel, which contains:

- ▶ 40% medical grade honey
- ▶ Medical grade hypoallergenic lanolin (Medilan™; Croda)
- ▶ Propylene glycol (a common pharmaceutical filler used in gels/ointments)
- ▶ PEG (poly-ethylene-glycols) 4000 (PEGs are a family of water-soluble linear polymers that are used in a variety of pharmaceutical, cosmetic, ophthalmic solutions and oral pharmaceutical applications)
- ▶ Vitamins C and E.

The dressing is indicated for acute and chronic wounds. The white polyethylene film allows exudate to pass to a secondary dressing.

The dressing is comparable to other non-adhering products like Adaptic™ (Smith & Nephew), Cutecirin™ (Smith & Nephew) or Jelonet™ (Smith & Nephew), but with the difference that

it has antibacterial properties due to the addition of honey.

In a recent survey looking at honey as a topical wound dressing, it was found to provide tissue debridement, control infection and provide a moist wound healing environment (Sibbald et al, 2011).

In another study of 22 patients in a home care setting with lower extremity wounds, the same honey gel that is used in L-Mesitran Tulle was shown to control infection within a few days, with all the wounds progressing to healing without any adverse effects (Kegels, 2011).

## Case report

The author works in a home care setting, which provides services for approximately 8,500 patients in the Rotterdam area. L-Mesitran Tulle was tested on four randomly selected patients with hard-to-heal wounds (Table 1).

Patient consent for this new treatment was obtained. This article describes one of the cases in detail, but the treatment of the other patients was performed using the same wound care regimen.

### Case: infected diabetic ulcer

This 65-year-old female patient with type 2 diabetes had developed a pressure ulcer on her right heel through being immobilised in hospital.

The patient was hospitalised for abdominal surgery and also developed a category 4 pressure ulcer on her coccyx and category 2 pressure ulcers on both heels, although only the right heel wound was open.

The blister on the right heel had become infected. Due to the abdominal operation the patient was weak and had a poor appetite.



Figure 1. The necrotic infected heel wound.



Figure 2. After four weeks of treatment the wound bed was clean and granulating quickly.

Her glucose was not controlled after the surgery and she had lost a lot of fluid due to loss of exudate through the ulcer on her coccyx. She had become depressed and had to be encouraged to mobilise and regain her appetite.

Although she was bedridden, she refused the offer of a pressure-relieving mattress and was in a great deal of pain after surgery. Pain medication and antibiotics for the infected coccyx wound were being administered.

The intact category 2 ulcer on the right heel showed signs of infection with *Pseudomonas aeruginosa*, as indicated by the colour of the exudate when the

skin was eventually broken, despite the provision of oral antibiotics.

After partial scab removal (mostly with sharp debridement, but also with L-Mesitran Tulle), a hydrogel dressing was applied to keep the wound moist. After a week, however, the wound did not appear to be improving and the honey-based L-Mesitran Tulle was applied to provide debridement and infection control.

The L-Mesitran Tulle dressing was applied directly on the wound after it was cleaned with tap water. For the first three weeks the L-Mesitran Tulle was changed daily and covered with a foam dressing. However, at the start of the L-Mesitran Tulle treatment the wound was producing a high level of exudate, which initially seemed to dilute the gel. However, when the dressing was being changed every day, it was still effective in fighting the bacteria. After three weeks the exudate level had reduced, as was the bacteria. At this point it was considered appropriate to reduce the dressing changes to three or four times a week.

## Results

The necrotic infected heel wound (Figure 1) debrided quickly and demonstrated a clean and granulating

wound bed after approximately four weeks (Figure 2). The wound epithelialised during the next three weeks and after seven weeks was fully healed (Figure 3).

The patient had no pain or sensation during wear time or at dressing changes, partly due to diabetic neuropathy. In some cases, honey can cause a sensation of pain, but this did not happen with this dressing.

No maceration was observed and the dressing created a moist wound environment. A moist wound environment means that the cells and growth factors can migrate more effectively than in a dry wound. This will result in less scarring and reduced pain for the patient. However, a balance has to be struck as an overly wet wound (usually through exudate production) will also impede growth factors.

In the other three cases that were evaluated, the dressing achieved similar results. In the other wound that was infected with *P. aeruginosa*, the dressing destroyed the infection within three weeks and the wound status changed from wet to moist.

The dressing demonstrated that it was able to reduce exudate and promote granulation and epithelialisation in all



Figure 3. After seven weeks the wound was fully healed.

four cases. After three weeks the edges of the wounds were less red, indicating reduced infection, the patients were experiencing less pain and there was reduced odour.

The wounds had also moved from wet wounds that were producing too much exudate, to a moist wound environment. The wound featured in the case report, also exhibited a large percentage of granulation tissue (Figure 3) and re-epithelialisation occurred swiftly.

## Discussion

As the population ages, underlying pathologies (e.g. renal failure, hypertension, etc) become more complex and their influence on healing means that wounds are more likely to become chronic (Sibbald et al, 2011). This will result in home care practice being regularly confronted with colonised and infected wounds (Bjarnsholt et al, 2008).

Therefore, it is logical that antibacterial dressings will have to be used more often. With an increasing problem of antibiotic resistance worldwide (Oudhuis et al, 2008; Rijnders et al, 2009), honey-based products could be an attractive alternative, as, to date, no bacterial resistance to honey has been reported (Cooper et al, 2010).

Table 1

### Patient population

Sex (age)	Wound type	Location	Bacteria
Female (64)	Pressure sore	Heel	Not identified
Female (65)	Diabetic foot ulcer	Under the foot	<i>Pseudomonas aeruginosa</i>
Male (74)	Surgical wound	Abdomen	<i>Pseudomonas aeruginosa</i>
Female (71)	Radiation wound	Thorax	Not identified

Honey has proven broad spectrum activity against bacteria ranging from *Acinetobacter* species to *Yersinia ruckeri* (Blair, 2009). It has been established *in vitro* that the gel of L-Mesitran Tulle is able to effectively destroy Meticillin-resistant *Staphylococcus aureus* (MRSA), Extended-spectrum Beta-Lactamases (ESBL) and other antibiotic resistant bacteria (Stephen-Haynes and Callaghan, 2011). This study reflected these *in vitro* findings *in vivo* with two patients infected with *P. aeruginosa*.

In the wounds featured in this case report, debridement took place quickly, one of the key features of honey-based products (White, 2005; Molan, 2006). The stimulation of angiogenesis by honey-based products (Rossiter, 2010) is clearly demonstrated by the rapid epithelialisation described in this evaluation.

### Conclusion

The author acknowledges that this evaluation has a small and highly selective sample size.

However, the patient experience outlined here leads to the conclusion that L-Mesitran Tulle has the potential to effectively combat infections and stimulate granulation and epithelialisation.

When used with heavily exuding wounds, daily dressing changes were necessary, but at moderate-to-low levels of exudate, changes performed every three days were sufficient. **WUK**

### Declaration

*These case reports were carried out independently and with patient consent. The author declares that they have not been sponsored in any way for this evaluation, other than that the products were provided free by the manufacturer.*

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### Key points

- ▶▶ Finding a dressing that provides an optimal wound healing environment for the patient and is also cost-effective can be a difficult process.
- ▶▶ This is particularly true for hard-to-heal wounds, which are associated with long duration and a high incidence of complications, often resulting in considerable quality of life and financial burdens.
- ▶▶ This article evaluates a new dressing, L-Mesitran™ Tulle, in a clinical setting. This is a non-adherent polyethylene dressing impregnated with L-Mesitran Soft gel.
- ▶▶ This 65-year-old female patient with type 2 diabetes had developed a pressure ulcer on her right heel through being immobilised in hospital.
- ▶▶ Honey-based products could be an attractive alternative to other treatments, as, to date, no bacterial resistance to honey has been reported.
- ▶▶ In the wounds featured in this case report, debridement took place quickly, one of the key features of honey-based products.
- ▶▶ The author acknowledges that this evaluation has a small and highly selective sample size.