Using honey-based dressings in post-operative wound dehiscence

KEY WORDS
- Honey
- Dehiscence
- Infection
- Surgery

Total laryngopharyngectomy is usually performed in patients with advanced stage hypopharyngeal tumours. Such patients frequently have complicated medical histories, with severe co-morbidities aggravated by long-term heavy smoking and drinking habits. As such, those patients are more prone to post-operative complications, especially if they have previously undergone neck radiotherapy.

Some of the most challenging post-operative complications include wound dehiscence and/or infection, and pharyngocutaneous fistula. Standard treatments include coverage and local wound care, including daily packing. Failure of primary treatment leads to further surgery, with skin flaps and free grafts, which increase patients' morbidity, inpatient time and financial costs.

More effective dressings that may avoid the need for invasive therapies are being investigated. Recent studies have seen honey-based products demonstrate very positive results in acute and chronic wounds, due to their debriding action (Subrahmanyam, 1991), anti-inflammatory and antibacterial activity (Cooper et al, 1999; Cooper and Molan, 1999; Molan, 2006), and fibroblast stimulation (Molan, 2006; Du Toit and Page, 2009).

HONEY IN WOUND CARE

Standard treatments for chronic wounds include coverage and local wound care with several dressings. The most commonly used are silver-impregnated dressings, due to their well-known antibacterial activity and debriding action. However, some studies have demonstrated significant cytotoxicity towards fibroblasts and keratinocytes — essential components involved in wound repair (Bradshaw, 2011).

Recent studies have compared silver dressings with honey, proving the superior efficacy of the latest in wound cicatrisation (Molan, 2006).

Honey is a viscous, oversaturated sugar solution, mainly constituted by glucose (30%), fructose (40%), sucrose (5%) and water (20%), as well as amino acids, vitamins, minerals and enzymes (Sato, 2000). It has been used in wound care since ancient times but recent studies have increased interest in this substance, based on the demonstration of its benefits.

Histologically, research has demonstrated that honey appears to have debriding action (Subrahmanyam, 1991) and to draw fluid from the underlying circulation, providing a moist environment and topical nutrition that may enhance tissue growth (Cooper, 1999; Molan, 2006).

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Additionally, it has been shown that honey has anti-inflammatory properties, reducing oedema, improving epithelialisation, and preventing hypertrophic scarring (Cooper, 1999; Jull, 2008; Molan, 2006). Recent studies have also demonstrated the significant antibacterial activity of honey, particularly Manuka honey (a monofloral honey derived from the leptospermum tree species in New Zealand and Australia).

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Figure 1: 5 July, 2011 — suture dehiscence and necrosis of both skin flaps and donor site at the right shoulder.

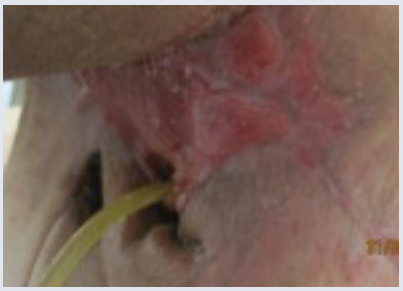

Figure 3: 31 August, 2011 — neck after 61 days of honey treatment.

Figure 4: 7 September, 2011 — shoulder after 68 days of honey treatment.

Figure 2: 11 July, 2011 — right shoulder after 10 days of honey treatment.

These antibacterial qualities are quite apart from its peroxide activity and osmolarity, and is related to the action of a substance termed Unique Manuka Factor (UMF), which is effective against *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa* (Molan, 2006; Bradshaw, 2011).

CASE REPORT

This 47-year-old male patient presented with a loco-regional advanced right pyriform sinus tumour, with skin invasion on the anterior part of the neck. He was a moderate smoker and alcohol drinker, and suffered from hypertension and arrhythmia. Due to the advanced stage of the tumour — IVb, according to NCCN (2011) — he underwent total laryngopharyngectomy on 24 June, 2011, with concomitant hemithyroidectomy, bilateral neck dissection, creation of a pharyngostome, partial removal of the skin from the anterior area of the neck, and coverage of the skin defect with left cervico-thoracic and right deltopectoral skin flaps.

Four days later, the development of significant haematoma forced the patient back to the operating room for homeostasis revision, and on 1 July, 2011, despite local wound care with compressive dressing and systemic antibiotics, extensive suture dehiscence and necrosis of both skin flaps and donor site (at the right shoulder) occurred (*Figure 1*).

Treatment plan

After receiving the patient's consent and based on previous results with similar patients at their department, the authors introduced a honey-based ointment (L-Mesitran) on 1 July, 2011. The wounds (suture dehiscence of both skin flaps and donor site at the right shoulder) were cleaned with saline and L-Mesitran was applied daily, which was then covered with an absorbent, Hydrofiber dressing (Aquacel®, ConvaTec).

The surrounding skin was treated with a hypoallergenic, semi-permeable barrier cream (Cavilon®, 3M), to avoid friction and lesions to healthy tissues. The primary dressing was covered and fixed with self-adherent dressing, made of apertured, non-woven polyester fabric coated with a layer of acrylic adhesive (Mefix®, Mölnlycke).

The honey-based treatment was well tolerated by the patient who found it comfortable and only experienced a mild painful sensation, which quickly faded away once the honey had been applied. Antibiotic sensitivity testing was performed, and there was no need to modify the systemic antibiotics introduced at the revision surgery.

Results

For the first three days that L-Mesitran was applied, the wounds had a very light foetid odour and mechanical debridement was performed. There was a progressive and significant improvement of the wound dehiscence. Just one week after the beginning of the course of honey-based dressings, there was no necrotic tissue in the wounds, which over the next few days, started to show granulation and epithelialisation (*Figures 2* and *3*) .

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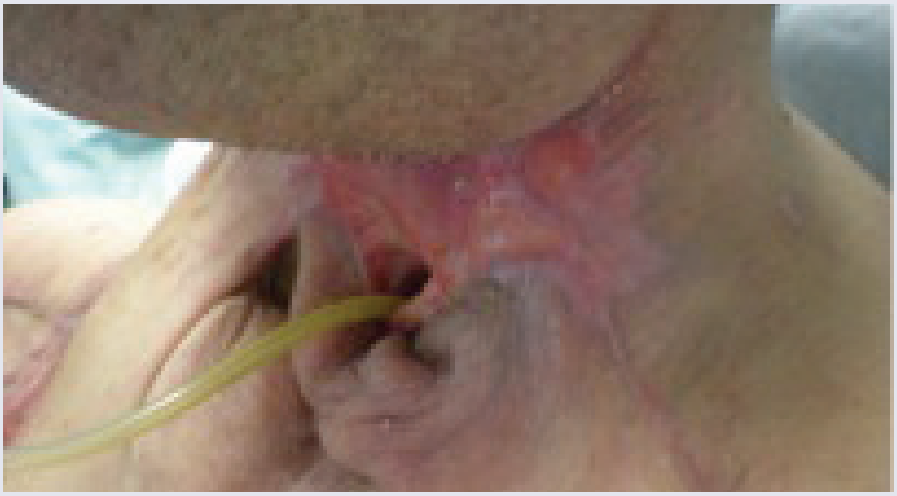

Figure 5: 7 September, 2011 — neck after 68 days of honey treatment.

Figure 6: 23 November, 2011 — shoulder after 145 days of honey treatment.

Figure 7: 23 November, 2011 — neck after 145 days of honey treatment.

The patient was discharged on 29 July, 2011, and the same daily dressing regimen was performed in the outpatient department. Adjuvant radiotherapy was initialised on 6 September, 2011, after total cicatrisation of the wounds (*Figures 4* and *5*).

At the time of writing, the patient had successfully completed neck radiotherapy and is waiting for the closure of the pharyngostome in the operating room. The wounds remained fully closed, despite local radiotherapy (*Figures 6* and *7*).

DISCUSSION

Hypopharyngeal cancer is less frequent than laryngeal cancer, but has a much poorer prognosis, partly due to asymptomatic evolution until late-stage presentation (Quon and Goldenberg, 2011). Despite its lower incidence, it still accounted for 124,000 cancer cases worldwide in 2002, and, more importantly, all case series show a five-year overall survival rate of 25% (Quon and Goldenberg, 2011). As such, those patients are often submitted to more aggressive treatments, from chemo-radiotherapy to substantial neck surgery.

Fasciocutaneous skin flaps are used to provide coverage when a skin graft or random skin flap is insufficient (e.g. for coverage over tendon or bones). They are simple to elevate, quick, and fairly reliable in healthy patients. Compared to muscle flaps, they are less bulky and indicated when thinner flaps are required (e.g. in the peri-tracheostoma area), without functional loss (Robertson, 2012). Disadvantages include significant donor site morbidity (especially with large flaps) and less resistance to infection than muscle flaps (Robertson, 2012).

This patient developed flap and donor site necrosis but honey was successfully used for the treatment of complicated wounds (Subrahmanyam, 1991; Molan, 2006; Cooper et al, 1999; Du Toit and Page, 2009) including the donor sites (Misirlioglu et al, 2003).

In this patient, good results were achieved in a relatively short time, with complete healing of the wound in two months, without needing adjuvant therapies and/or surgical revision.

CONCLUSION

In this case, the use of honey-based L-Mesitran was safe and effective. The authors continue to use honey-based dressings as an alternative and experimental local therapy. Nevertheless, positive results verified in 20 other patients with laryngeal and/or pharyngeal cancer and similar serious co-morbidities will be presented to the Instituto Português de Oncologia, in order to get approval for the incorporation of honey dressings as standard treatment protocol for this type of post-operative wound. WUK

DECLARATION

This case study was done with the patient's consent. The authors declare no conflicting interests.

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