

The use of manuka honey to facilitate the autoamputation of fingertip necrosis

KEY WORDS

- ▶ Honey
- ▶ Malodour
- ▶ Necrosis
- ▶ Slough

This case study describes the problems encountered by a patient while waiting for his necrotic fingertip to autoamputate. This mechanism usually takes place in a dry wound environment, however in the patient's case the necrosis had started to soften naturally, resulting in malodour, considerable pain and slough. The original dressing regimen had to be adapted and Algivon Plus Ribbon was selected as the dressing of choice. The multi-factorial action of this 100% medical-grade manuka honey dressing includes deodorisation, pain management and debridement, all of which dealt with the patient's problems effectively.

Although honey has been used for centuries in wound care, it is now being integrated into modern medical practice (Seckham and Cooper, 2013). The acidity of honey increases the release of oxygen from haemoglobin, thereby making the wound environment less favourable for the activity of destructive proteases, and the high osmolarity of honey draws fluid out of the wound bed to create an outflow of lymph, as occurs with negative pressure wound therapy (Molan and Rhodes, 2015).

Antibiotic-resistant bacteria have become a widespread clinical problem, leading to a renaissance in the use of honey (Molan, 2002). Honey is often described as an 'all-in-one' dressing because of its properties. Honey has many properties that are beneficial to wound healing, including (Evans et al, 2014):

- ▶ Antimicrobial action
- ▶ Deodorisation
- ▶ pH-modulating agent
- ▶ Debridement
- ▶ Anti-inflammatory action
- ▶ Scar reduction
- ▶ Stimulation of new tissue growth (angiogenesis)
- ▶ Biofilm control effect
- ▶ Pain management.

Several vascular and pathogenic conditions cause individuals to be predisposed to chronic wounds, which can lead to autoamputation in

extreme cases. Such conditions include Buerger disease, also known as thromboangiitis obliterans, Raynaud's disease (primary) and Reynaud's phenomenon (secondary) and uncontrolled diabetes (Salcio, 2015). Inflammation due to thromboangiitis obliterans affects the smaller vessels in the arms and legs, and is associated chronic pain, gangrene and chronic ulceration of the digits, particularly the great toe and fingers (Olin, 2000). Raynaud's disease generally affects the fingers and toes, is more common in colder climates and affects an estimated 11% of women and 8% of men (Butendieck et al, 2014). It is often triggered by sudden changes in temperature, and is less likely to lead to severe complications than Reynaud's phenomenon (Salcio, 2015). Raynaud's phenomenon is associated with other diseases and secondary complications, e.g. scleroderma and lupus, and symptoms are more obvious in older patients. Episodes are often painful and can be associated with ischaemic skin lesions and autoamputation (Wigley, 2002; Salcio, 2015). In patients with diabetes, particularly those whose condition is poorly controlled, neutrophilic ulcerations or mutilating fingertip ulcer of the digits can lead to autoamputation (Salcio, 2015).

CASE STUDY

DH is a 57-year-old male who initially presented to the GP on 9 September 2014 with blue fingertips. On examination by the GP, it was

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Figure 1. The practice nurse noted slough at the necrotic fingertip, exudate and worsening malodour



Figure 2. Algivon Plus Ribbon, chosen to tackle the slough and malodour, was wrapped around the figure

noted that both radial and ulnar pulses were present. Raynaud's disease was queried and the patient was commenced on nifedipine with a follow-up appointment 2 weeks later.

Past medical history

The patient, who lives alone, has a history of:

- ▶▶ Emphysema, and is a current heavy smoker
- ▶▶ Hypertension
- ▶▶ High alcohol intake
- ▶▶ Poor eyesight, being registered as partially sighted.

Two weeks later, DH attended A&E with a necrotic middle fingertip. Due to his poor eyesight, it is not clear when the digit became necrotic. A duplex ultrasound scan showed a thrombus in the distal ulnar artery with a non-occlusive thrombus

in the distal radial artery. A&E referred DH back to the GP practice with a recommendation to use a povidone iodine-impregnated gauze dressing covered with a dry secondary dressing. The patient was commenced on dalteparin, (a subcutaneous antithrombotic injection) and advised to wait for the finger to autoamputate. Initially he was cared for at home by the district nurses, who continued this dressing regimen.

Method

On 2 October 2014, DH's care was taken over by the practice nurse. The nurse obtained written consent and advised the patient that photographs and measurements would be taken at every visit to assist in documenting progress of the autoamputation. The inclusion of photographic records in the patient's notes is viewed by Collier (2003) as an integral component of the wound assessment process. Very quickly the nurse noticed a malodour, which was soon to become

very distressing to the patient. A few days later, with worsening malodour, an area of slough developed at the necrotic fingertip and the wound became very wet (Figure 1).

Both Collier (2003) and Ousey and Cook (2011) highlight the importance of accurate skills in wound assessment when effectively planning, implementing and evaluating care for patients. It became apparent that the povidone iodine dressing that was used at the beginning of treatment was no longer suitable, as it was ineffective in absorbing the increased levels of exudate and dealing with the malodour. No single dressing is suitable for the management of all types of wounds, and few are ideally suited for the treatment of a single wound during all stages of the healing cycle (Stephen-Haynes, 2011)

The practice nurse, who was inexperienced in dealing with this type of wound, sought advice from the director of the Welsh Wound Innovation Centre and, after some discussion, she advised the nurse to switch DH to Algivon Plus Ribbon (Advancis). This product is a reinforced alginate ribbon impregnated with 100% medical-grade manuka honey. The ribbon product was chosen specifically as it has reinforced fibres enabling a sustained, slow release of honey while maintaining the integrity of the dressing. Also, the ribbon is anatomically shaped to fit easily around the finger. It was felt that this alginate dressing would be effective in dealing with the slough and malodour, as well as preventing infection, and therefore facilitate autoamputation of the fingertip. The Algivon Plus Ribbon was wrapped circumferentially around the finger, with another layer over the top of the finger extending down the sides (Figure 2). This was secured with a foam secondary dressing, to further absorb excess exudate, and a finger bandage.

DH's three main problems were malodour, pain and wet slough. Firstly, malodour is a common feature in many wounds and is caused by the presence of anaerobic bacteria that produce malodorous compounds from decomposed serum and tissue proteins (Bowler et al, 2001). DH found the malodour from his finger a significant problem which caused him great embarrassment. Simon et al (2009) agree that the malodour produced from some wounds can result in severe

discomfort and social isolation for the patient. They cite the case of a patient who had significant malodour with a wound that smelt like a 'dead rabbit'. However, this problem was successfully eliminated with the application of honey within 2 weeks. DH was delighted that the Algivon Plus successfully dealt with the malodour in a short space of time.

Secondly, the wound was very painful and Oramorph was required prior to each dressing change using a visual analogue scale (where 0 is no pain and 10 being severe pain), DH usually reported a score of 10/10. Soon and Acton (2006) describe how stress and anxiety from wound infection or wound pain can indirectly impair wound healing by activating the hypothalamic–pituitary–adrenal axis; this stimulates cortisol production, which can in turn suppress the immune system. Throughout the following month, the wound became less painful and the dressing changes were better tolerated, which led to the Oramorph being discontinued by the end of November. A small study carried out by Evans and Mahoney (2013) found that following treatment with honey products, 71% of patients who initially presented with pain saw a reduction in pain levels.

Thirdly, slough is made up of white blood cells, bacteria and debris as well as dead tissue (Brown, 2013). Desloughing wounds helps to prepare the wound bed for healing and minimises the risk of infection (Strohal, 2013). There are several methods of desloughing wounds and the one that is most commonly used in the community setting is autolytic debridement. This uses the body's own enzymes and moisture to rehydrate, soften and liquefy slough using various products, including antimicrobials to create a balanced wound environment (Gray et al, 2011). Honey creates an ideal moist wound environment to facilitate autolysis by drawing out lymph fluid from the wound tissues through its strong osmotic action (Evans et al, 2014). This action provides a constantly replenished supply of proteases at the wound bed which explains the notably rapid debridement that honey induces (Molan, 2002). Algivon Plus was an excellent choice to use on DH's wound due to its debriding action. The alginate was effective in absorbing the wet slough

which improved overall dressing comfort.

Results

By 11 November, the wound was still wet and sloughy but the malodour had disappeared and the necrotic fingertip was beginning to detach. The Algivon Plus Ribbon was continued in order to deslough the wound and facilitate autoamputation (Figure 3). The amount of wet slough gradually lessened. The dressing was an excellent choice to use on DH's wound due to its debriding action. The autolytic debriding action of honey comes from its ability to convert inactive plasminogen in the wound matrix to plasmin, which is an active enzyme (Molan, 2005). Honey creates an ideal moist wound environment to facilitate autolysis by drawing out lymph fluid from the wound tissues through strong osmotic action (Evans et al, 2014). This action provides a constantly-replenished supply of proteases at the wound bed and overlying necrotic tissue, which could explain the notably rapid debridement that honey induces (Molan, 2002).

The amount of wet slough gradually lessened and on 5 December, the tip became dry so the dressing was changed back to the povidone iodine-impregnated gauze. Unfortunately, the wet slough appeared again, so Algivon Plus Ribbon was recommenced. The fingertip detached on 24 December (Figure 4) and use of the Ribbon was continued until 6 January, when the wound was found to be dry. A foam dressing was used to protect the area.

Vascular services at the local hospital were pleased that although the topography of the fingertip was irregular, all the tissue had epithelialised (Figure 5). The



Figure 3. By 11 November, the malodour had gone and the necrotic fingertip had started to detach



Figure 4. The fingertip detached on 24 December and a foam dressing was used to protect the area

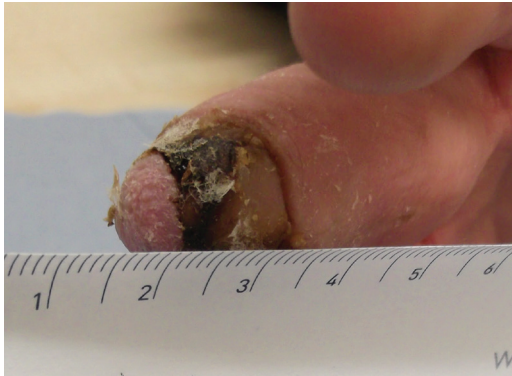


Figure 5. All the tissue epithelialised and the patient was advised to exercise his finger as much as possible



Figure 6. Healing was successful. The patient is awaiting plastic surgery to improve the finger's appearance

patient was advised to dispense with all dressings and to exercise the finger as much as possible to encourage the soft tissue to settle before referral for plastic surgical intervention.

Patient update: January 2016

DH has been reviewed by the plastic surgeon and finally, more than a year after the fingertip autoamputated, he is on a short waiting list to have surgery to improve the aesthetic look of his finger, which he is delighted about.

DISCUSSION

This was an extremely unusual case, as autoamputation usually occurs in the toes whereas this patient still had to function and use his hands during the treatment period. Waiting for a digit to autoamputate is very distressing, as the patient sees his or her body fail in front of their eyes. DH had to endure this for a period of 3 months.

Autoamputation normally takes place in a dry wound environment. However, for this patient the body's natural propensity to debride its own necrotic tissue meant that the necrosis started to soften naturally. This resulted in a wet, sloughy, painful and malodorous wound, which meant that the normal wound management plan had to be adapted. The practice nurse worked with the director of the Welsh Wound Innovation Centre to produce a management plan that was patient-focused and alleviated the distressing symptoms. Algivon Plus Ribbon was well tolerated, cost-effective and facilitated the safe autoamputation of this digit.

CONCLUSION

This case study demonstrates how an individual faced with the distressing situation of having to wait for a necrotic fingertip to autoamputate was treated with a dressing that ensured his concerns about pain and malodour during this process were alleviated.

This is a good example

of how a collaborative approach worked in the absence of any previous experience of this wound presentation. At all times the patient was the focus of the wound plan. Keeping the wound free from infection, allowing daily life to continue, was of paramount importance. The additional advantages of the antimicrobial dressing were the reduction in malodour and pain.



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