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Diversified wound management with a honey-based ointment.

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INTRODUCTION

The efficient and correct management of wounds remains a clinical problem, frequently causing morbidity and mortality due initial and delayed complications. Consequently, a considerable amount of research been performed to identify and continuously develop novel therapeutic approaches and technologies for the management of acute and chronic wounds (VELNAR). The development of new approaches however requires understanding the physiological trajectory of normal wound healing (Shankar), described as the phases of hemostasis, inflammation, proliferation, and remodeling.

These four highly programmed, integrated and overlapping phases, are required to occur in a specific time frame and sequence, for successful wound healing to occur (Guo & DiPietro). Numerous factors can cause a disruption or affect one or more of these stages (VELNAR), resulting in a non-healing chronic wound or delayed wound healing (Guo). The latter has through history been a global concern due to the distress and discomfort it causes to the patient (Fagerdahl). Subsequently to the rate of wound healing and especially in aesthetically sensitive locations the degree of scarring post wound healing become an important factor to consider due to the life-long psychological and or functional implications it may have on the patient (Marshall). Although novel wound care techniques such as negative pressure wound therapy (NPWT) has been developed and implemented with great success in the past two decades, certain individual patient related factors can necessitate the consideration of other therapies. A study performed by Fagerdahl (2014) highlighted patient experiences with the use of negative pressure wound therapy, these areas included i.e. the affect this therapy had on the patients personal environment (physical, mental, social and spiritual aspects). Other important factors to either manage or consider is existing infection or the possibility of infection, as a wound causes the skin to be impaired and therefore highly susceptible to bacterial infiltrations. By preventing or treating these infections effectively, it can significantly improve the wound healing (Negut), however accomplishing this task has become a difficult endeavor in the modern age, due to the increasing amount of antibiotics that because of bacterial resistance is rendered effective. Hence, exploring alternative therapies becomes increasing crucial, and although many exists, implementation thereof may be challenging (Ghosh).

Types of wounds Some examples of acute and chronic wounds are:

- pressure sores
- lower-extremity ulcers wound care
- chemical and radiation injuries
- burn wounds, which can be classified according to depth, i.e. superficial, partial thickness, full thickness, sub-dermal.

A full assessment of the wound bed is required before selecting a wound care dressing. The following factors should be taken into consideration:

- size, depth, shape and location of the wound
- amount of exudate
- presence of an odour
- presence of necrotic tissue
- bacterial load.

By considering the above-mentioned factors the approach in the following case studies was utilizing a product containing an age old remedy, honey.

The utilization of honey based topical product has reemerged in the past few decades, with more evidence and data supporting beneficial claims associated with the use of honey-based products on wounds such as the pH lowering effect on the wound, ability to penetrate bio-films, debriding capacity, antibacterial and anti-inflammatory activity (Minden-Birkenmaier).

During the formulation of Wound Occlusive (honey-based ointment), the main focus was on creating a product that could be successfully utilized during all phases of wound healing, that is user friendly and that will minimize scarring. Although Wound Occlusive contains 50% (w/w) honey, the formulation in its entirety contributes to the mechanism by which wound healing is facilitated by this product such as:

- Zinc oxide (shown to increase the rate of wound healing (Kogan 2017))
- Xylitol (can inhibit or interfere with biofilm formation (Rhoads))
- Hyaluronic Acid (modulates tissue regeneration, (Litwiniuk))

The selection of secondary dressing also plays an important role in the treatment of wounds. The dressing types utilized in the following cases was determined after evaluation of the respective wounds.

Indications for Wound Occlusive

CASE DESCRIPTIONS

Patient A is a 70-year-old male that presented with a post skin flap surgical wound. Injuries the patients' knee was the result of a car accident 2 year prior, were a skin flap was eventually performed. Up to date the wound was being treated using a vacuum dressing. The main complaint of the patient was that his quality of life was being affected by the current treatment as he was no longer able to function in his current job, and the use of the vacuum dressing necessitated him to visit a professional nurse with every dressing change while he was not noticing real improvements. The patient has diabetes Type 1, is a non-smoker and appeared generally healthy.

The wound was located on the lateral side of the left knee, and during the first observation it can be stated that there were clear signs of inflammation and edema in the tissue surrounding the knee and wound. The patient was submitted to hospital just prior to the appointment due to severe pain experienced. During the admittance the vacuum dressing was replaced, and the decision was made during this visit, that we would post-pone removing the vacuum dressing for another 5 days.

The treatment protocol followed consisted of cleaning the wound with saline, where after Wound Occlusive was applied to the wound as a thick paste. For this particular wound an absorbent dressing was applied as secondary dressing due to the amount of moisture on the wound. Initially the wound dressing was repeated every 24 h, although after the first two 24 h treatments, the wound was re-evaluated and moved to a 72 h regime.

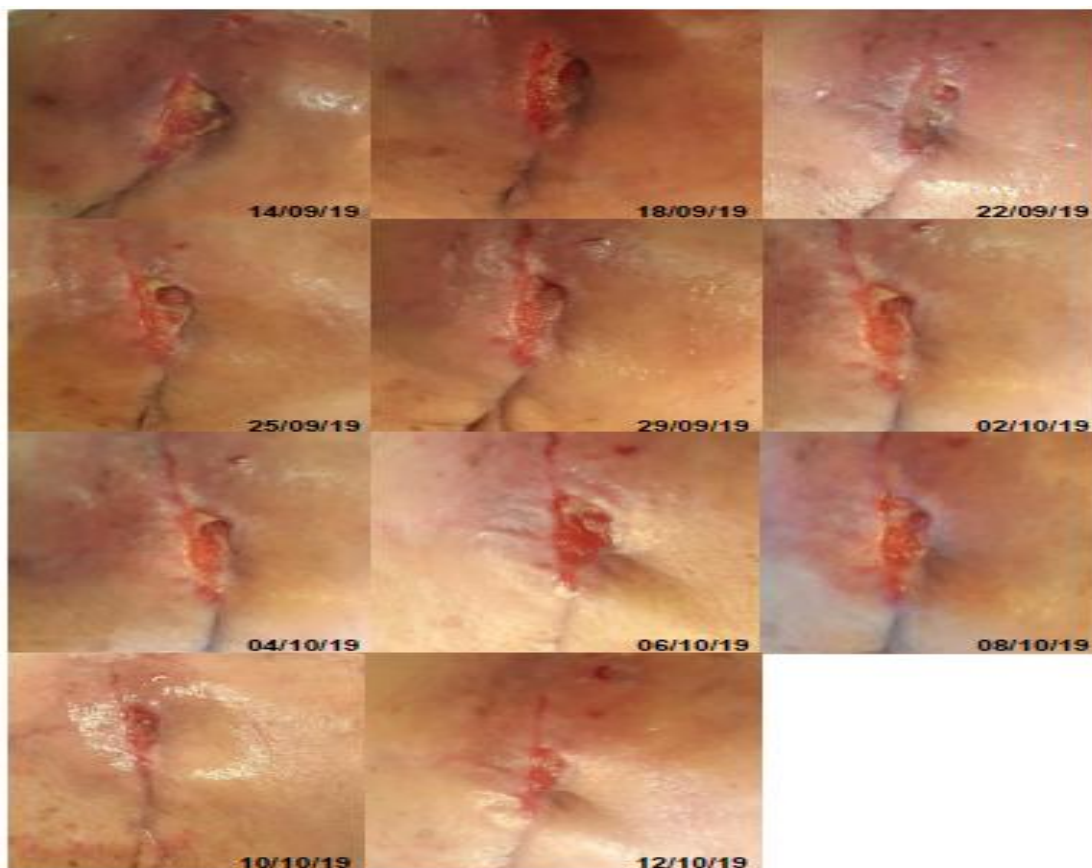


Figure 1: Patient A (post skin flap) progress after approximately 1 month

From Figure 1 it can be observed that the size of the wound decreased significantly over the past month. In addition, it was observed that inflammation and edema in the areas surrounding the wound decreased, this observation was supported by patient feedback.

Patient B is a 13-year male that presented with a significant soft tissue injury in the facial area post suture. The injury was the result of a hyena bite. The injury location ranged from the frontal region though the orbital, infraorbital, and buccal region to the oral region.



Figure 2: Patient B a) after initial surgery, and b), c) and d) displaying the progress made with healing of the wound over a period of 1 month.

From Figure 2b to Figure 2d it can be observed that the amount of scarring was significantly reduced. Patient C 31-year-old male presented with a brown recluse spider bite otherwise known as a violin spider. The bite occurred approximately 8 days before surgical debridement of

the wound was performed and was located on the left antebrachium (forearm). Patient C can be described as generally healthy with no chronic conditions. After surgical debridement, the wound was left open, hence the type of wound can be described as an open post-surgical wound.



Figure 3: a) the wound measurement before initiating treatment, post-surgery; b) the wound one week after initiating treatment.

When observing Figure 3a – Figure 3b it can be noted that both the length, width and depth of the wound decreased within the period of one week. Additionally, it should be mentioned that the amount of exudate present on the wound bed was markedly lower and no signs of infection could be noted.

CONCLUSION

Wounds can significantly affect a patient's quality of life in numerous ways due to pain, odor, decreased mobility, social isolation psychological problems such (i.e. depression and

anxiety) and the inability of the patient to perform daily duties and activities (Situm). These factors places emphasis on the importance of treating wound in a correctly, efficiently, and timeously manner to minimize the effects on other areas of the patient's life. This objective was achieved in the above-mentioned case studies with the utilization of Wound Occlusive. The ease by which the treatment can be applied could also be a beneficial factor as this might enhance patient compliance. This can be considered an attribute of Wound Occlusive due to the frequency of application (24 - 72 hour) and the ease of application. Additionally, the use of Wound Occlusive in daily wound care practice may pose a solution the increasingly perturbing problem of bacterial resistance toward antibiotics, as honey

provides advantageous antibacterial activity against a variety of microorganisms, with no known honey-resistant phenotypes identified up to date (Maddocks). It can be concluded from the above-mentioned case studies that Wound Occlusive can be successfully implemented in a variety of wound types.

Wound healing is a complicated process – the stages of wound healing do not occur in isolation. Considerable overlapping between these stages occurs. Patients are to be treated holistically and any underlying illness, nutritional status, age, hypoxia, immunity, stress factors and the use of corticosteroids will play a direct role in wound healing.