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Post-bariatric abdominoplasty resulting in wound infection and dehiscence—Conservative treatment with medical grade honey: A case report and review of literature

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ABSTRACT

INTRODUCTION: Wound complications in post-bariatric patients undergoing body-contouring surgery after massive weight loss are not uncommon and often, surgical debridement or conservative management is necessary. Honey is one of the most ancient remedies for wound care and it is also considered to possess debriding effects. Current research has demonstrated promising results showing that honey can improve wound granulation and epithelialization, reduce exudate and shorten healing times.
METHODS: This case report has been reported in line with the CARE criteria.
PRESENTATION OF CASE: A 40 year-old female suffered wound infection and dehiscence after undergoing post-bariatric abdominoplasty. The patient was not interested in surgical revision and split skin grafting. Therefore, conservative wound treatment with topical Manuka honey was instituted resulting in significant clinical improvement and effective healing concurrently with good patient satisfaction.
DISCUSSION: Surgical wound complications in post-bariatric patients undergoing abdominoplasty are common and often require surgical revision or conservative wound treatment. No previous publication has addressed outpatient treatment of post-bariatric abdominoplasty wound complications with medical grade honey.
CONCLUSION: Although more research is needed for definitive conclusions of honey's efficacy, it is safe and as presented in our case, it may under certain circumstances reduce the need of surgical wound debridement and serve as a remedy for conservative treatment.

1. Introduction

When surgery results in complications such as wound dehiscence and infection, surgical revision followed by split thickness grafting, or conservative wound treatment are often required interventions. In the post-bariatric patient undergoing body-contouring surgery after massive weight loss, the increased risk of wound complications is well-described [1]. For the conservative management of various wounds, several remedies and treatment methods are available. Honey is a culinary substance that has been known for centuries as a remedy for the treatment of a wide range of wounds and burns [2]. Yet, it is only recently that honey's mechanisms of action have been studied, and it is now acknowledged that honey exerts a wound-healing effect through a series of physical and bioactive properties [3]. Since surgery is not always desirable for the patient, application of wound dressings such as medical grade honey might be considered. We present the first published case of a postoperative wound dehiscence and infection after abdominoplasty in a post-bariatric patient that was considered for the usual surgical treatment, but was treated with topical medical grade honey resulting in rapid and effective wound healing concurrently with good patient satisfaction.

2. Methods

This case report has been reported in line with the CARE criteria [4].

3. Presentation of case

A 40 year-old non-smoking female underwent abdominoplasty two years after previous laparoscopic gastric bypass and massive weight loss, with vertical as well as horizontal suprapubic incisions. The defect was closed with resorbable sutures in the superficial fascia, dermis and in the skin. She was discharged three days later. Ten days post-operatively, the patient presented with wound infection and dehiscence. A swab culture was obtained from the wound bed, which confirmed presence of *Staphylococcus aureus* and the

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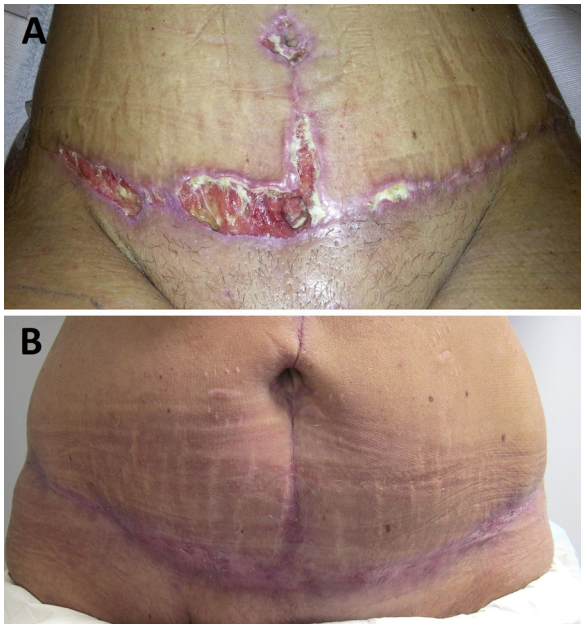

Fig. 1. Abdominoplasty resulting in wound infection and dehiscence. (A) Treatment with topical Manuka honey instituted (B) after six weeks a complete healing was achieved with a fine and cosmetically satisfactory scar tissue formation.

patient responded well to treatment with Dicloxacillin capsules 1000 mg × 3 daily for 7 days. However, the patient developed a large wound dehiscence with localized fat necrosis (Fig. 1A). The patient was not interested in surgical revision and split skin grafting. Negative pressure wound therapy was offered, but due to practical reasons it was not desirable to the patient. Therefore, conservative wound treatment with topical Manuka honey was instituted, after which a good and continuous progress in healing was observed. The patient did not undergo surgical revision and after six weeks, a complete healing was achieved with a fine and cosmetically satisfactory scar tissue formation (Fig. 1B). The patient was able to continue her daily work during the entire process of this outpatient treatment. She was pleased and satisfied with the process and the result of the treatment.

4. Discussion

Surgical wound complications in post-bariatric patients undergoing abdominoplasty are common and often require surgical revision [1]. Many post-bariatric patients are due to the bariatric surgery and the poor compliance of multivitamin supplement intake nutritionally deficient [5]. Studies have shown that post-bariatric patients have a significantly higher risk of developing complications after abdominoplasty, including wound infection and dehiscence, than non-post-bariatric patients. This is probably affected by the nutrition deficiency [1,5]. Therefore, surgical revision or conservative wound treatment are sometimes required. As presented in our case where revision surgery was not desirable for the patient, application of medical grade honey as a conservative treatment resulted in satisfactory and effective wound healing.

The ingredients of honey, which is a collection of nectar, are sugar (75–79%), water (20%), proteins, vitamins, minerals and antioxidants [6]. Honey possesses an antibacterial effect, which is in part due to the production of hydrogen peroxide (H_2O_2) on dilution, a naturally low pH, and an osmotic effect [7]. Medical grade honey can be applied either as a viscous mass or as a dressing (Fig. 2).

The production and presence of H_2O_2 is due to the enzyme glucose oxidase, which is activated when honey is diluted by wound exudate [6]. The concentration of H_2O_2 is low while still having

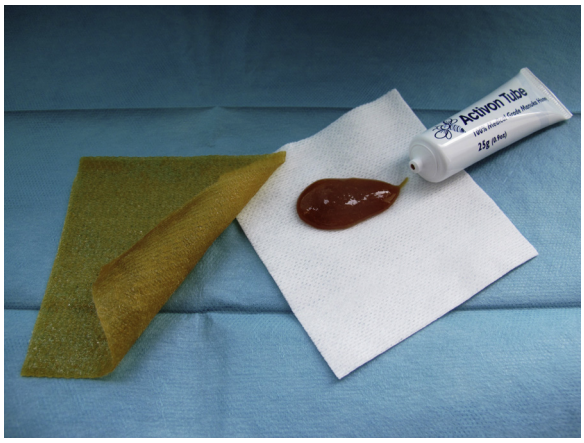

Fig. 2. Medical grade honey as a dressing and as a viscous mass.

a disinfectant and tissue debridement effect without being cytotoxic and causing tissue damage [8]. The naturally low pH of honey inhibits the growth of microorganisms, because the majority of these organisms thrive in environments with neutral pH. It has also been shown that the acidity of honey induces hemoglobin to release oxygen, which leads to an increase of tissue granulation and wound healing [9]. Furthermore, the hyperosmolarity and viscous properties of honey contributes to bacterial dehydration and eradication caused by an osmotic effect [10].

Manuka honey is a distinctive honey that possesses additional antibacterial factors. It is produced in New Zealand and is used as a medical grade honey in wound dressings licensed for clinical use in Australia, Europe and North America. Manuka honey's unique type of additional antibacterial activity is due to methylglyoxal and leptosin, which is recently identified [11]. Also, Manuka honey has an inhibiting effect on MRSA (methicillin-resistant *S. aureus*) as demonstrated by in vitro studies [3,11].

In order to not jeopardize the antibacterial effect of honey and to eradicate microorganisms, medical grade honey should be sterilized by gamma irradiation and not by heating which destroys the enzyme glucose oxidase [9,12]. In addition to its antibacterial effect, a lot of other properties have been attributed to honey. It has also been shown to reduce inflammation and to stimulate the immune response leading to acceleration in wound healing [3,13,14]. Additionally, it may reduce the need for surgical debridement [3,15].

As presented in our case, application of topical medical grade honey may act as a simple conservative method of treatment when wound dehiscence or infection occurs following post-bariatric abdominoplasty. To our knowledge after performing a review of current literature on this subject, no previous publication has addressed outpatient treatment of post-bariatric abdominoplasty wound complications with medical grade honey. From a clinical perspective, there is evidence that supports that honey can be used for the treatment of wounds. However, the level of evidence in the clinical setting is low since many of the studies have been carried out in vitro and because of the lack of high quality controlled or comparative randomized studies [16]. Additional research is needed to further understand the mechanisms of action and the efficacy of honey compared to other products, in order to clarify its clinical role.

5. Conclusion

Taking the above considerations, our presented case and the existing evidence of honey's efficacy into account, honey can be a gentle and effective remedy for the treatment of surgical wounds and like other wound dressings, it may find its place in the

modern wound care management in both the primary and secondary sectors of health care.

Conflict of interests

Authors have no conflict of interest to declare.

Funding

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Ethical approval

No ethical approval needed for this manuscript.

Consent

Written consent has been obtained from the patient for publishing the case and for the use of pre- and postoperative photos for publication purpose. All specific patient information is de-identified.

Author contributions

All authors have contributed equally to the above.

Guarantor

Dr. Steen Matzen

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