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Wound Care in Cats with Hanon Honey

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ABSTRACT

The present study was carried out in clinical cases of seven cats with the aim to evaluate the pattern of wound healing using Hanon honey from (Arbutus unedo) having non-healing chronic wound present at University veterinary hospital (UVH) Omar Al-Mukhtar University. Seven cats having a non-healing chronic wound. The pattern of wound healing was evaluated both clinically and by histopathological. All cases showed good progress in healing after application of the Hanon honey. The results ofthe study suggested that Hanon honey can be a better wound healing biomaterial in cats. It can be used as a less expensive skin substitute in order to stimulate and promote wound healing in cats as a stimulant for wound healing in chronic non-healing wounds.

العناية بجروح القطط بعسل الحنون

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الكلمات المفتاحية:
التئام الجروح.
العسل.
القط.
البكتريولوجيا.
عسل السدر.

الملخص

أجريت الدراسة الحالية في حالات إكلينيكية لسبع قطط بهدف تقييم نمط التئام الجروح باستخدام عسل حانون من (Arbutus unedo) بها جرح مزمن غير قابل للشفاء وكانت موجودة بالمستشفى البيطري الجامعي (UVH) جامعة عمر المختار. - سبع قطط مصابة بجرح مزمن لا يلتئم. تم تقييم نمط التئام الجروح سريريًا ومن خلال التابعه. أظهرت جميع الحالات تقدمًا جيدًا في الشفاء بعد دهن عسل حانون. أشارت نتائج الدراسة إلى أن عسل حانون يمكن أن يكون مادة حيوية أفضل في التئام الجروح في القطط. يمكن استخدامه كبديل جلدي أقل تكلفة من أجل تحفيز وتعزيز التئام الجروح في القطط كمحفز لالتئام الجروح في الجروح المزمنة التي لا تلتئم.

Introduction

Wound healing is one of the most complex biological events after birth [1]. It is a complex process of the replacement of dead tissue with vital tissue [2]. The objectives of any wound management are relief of pain and distress to the animal, functional and cosmetic repair, economic and time efficient procedures and prompt decision making in the event of signs of delayed healing [3]. In chronic wounds, the major focus of wound healing has been on the relationship between tissue destruction by excess inflammation and tissue synthesis stimulated by a pro-healing environment. Natural polymers have been increasingly studied for applications in health care due to their biocompatibility, biodegradability, and nontoxicity [4]. Honey is carbohydrate-rich syrup prepared by honey bees, derived from floral nectars and other plant secretions [5]. It is one of the most enduring materials to be used in wound care, attributed to its antibacterial, anti-inflammatory, and antioxidant properties [6, 7]. Antibacterial activity of honey is due to its high osmolarity, pH, hydrogen peroxide production, and presence

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of other phytochemical components that originate from the nectar of plants [5]. There are numerous reports on the antibacterial activities of honey against a wide range of microorganisms resulting with acceleration of wound healing process [5, 8]. The phytochemicalcomponent of honey is also responsible for its antioxidant activity which protects cells from the damage caused by free radicals thus decreasing the inflammation process [9]. It was reported that the free radical scavenging activities of honey is mainly due to the contents of flavonoids and phenolic acids [10, 11]. The present study was carried out in clinical cases of seven cats with the aim to evaluate the pattern of wound healing using Hanon honey from (Arbutus unedo).

Materials and Methods

Honey samples:

The honeys (Hanon honey) which produced by bees from Al-Jabal Al-Akhdar Libya kept were used in this study. The floral sources were Hanon honey from (Arbutus unedo) tree.

Details of clinical wound cases:

Seven cats having non-healing wounds were presented to University Veterinary Hospital (UVH), Omar Al- Mukhtar University. The signalmen of all cats is illustrated in Table (1)

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Table 1. Details of clinical wound cases treated in cats

Case No	Age in Month	Gender	Site of Wound	Exudates	Wound Size (2cm)	Duration of illness (days)
1	17	IM	Right Groin	Serosanguinous	16.21	17
2	22	SF	Distal hind limb	Purulent	3.2	11
3	27	IM	Right lower abdomen	Purulent	5.15	17
4	12	F	Right Groin	No exudates	7.2	10
5	19	CM	Left lower abdomen	No exudates	6.3	29
6	14	IM	Medial right hummer	Exudate	4.9	12
7	12	IM	Medial right forearm	Purulent	9.14	15

All cats were Domestic Short Hair (DSH), I.M=Intact male, C.M=Castrated male, F=Intact female. S.F= Spayed female

Earlier, animals were treated using normal saline and povidone iodine for a period of 10-29 days with a course of oral antibiotics but showed no signs of wound healing. Hanon honey sufficient enough to cover the wound was soaked, kept on the wound and protected with a bandage. The same procedure was repeated once in a week. It was advised for Vitamin and mineral supplementation (Revital – Ranbaxy) ®3ml daily for 3 weeks.

Histopathological Analysis:

Skin samples were fixed in 10% formalin solution and embedded in paraffin. Tissue sections of 4-5 µm thickness were cut, stained with hematoxylin and eosin (H&E), and examined under light microscope. Digital photomicrographs were captured at representative locations using an image analyzer (Analysis LS Research) attached to a light microscope (Olympus BX51, Japan). The wounds were evaluated for the extent of reepithelialization, granulation tissue formation, architecture, cellularity, and inflammation.

Bacteriological examination:

Sterile cotton swabs were gently rolled over wounds and streak on Blood and Mackonkey agar plates, for the bacteriological examination. After an incubation period of 24 hours, the colony growth was observed an identified by biochemical test according to the technique described in the manual (Bacteriology Lab Manual, 2008 and Manual of Bacteriology Laboratory Faculty of Veterinary Medicine, OMU).

Results and Discussion

Hanon honey was well tolerated in all the cases. No animals showed any intolerance and disturb did not the bandage throughout the treatment. Formation of healthy granulation tissue was observed in all the cases without any side effects, After the first application of Hanon honey, there was a marked reduction in wound discharge and there was presence of new shiny and bright red granulation tissue, which indicated angiogenesis and healing of the wound [12, 13, 14]. Granulation tissue started filling the wound by 7th day and completely covered the metacarpals by 21st day of treatment. Epithelial proliferation was initiated by 21st day and almost completed by 35st day (Figure: 1, 2, 3).

Fig. 1. Wound Before and After Healing

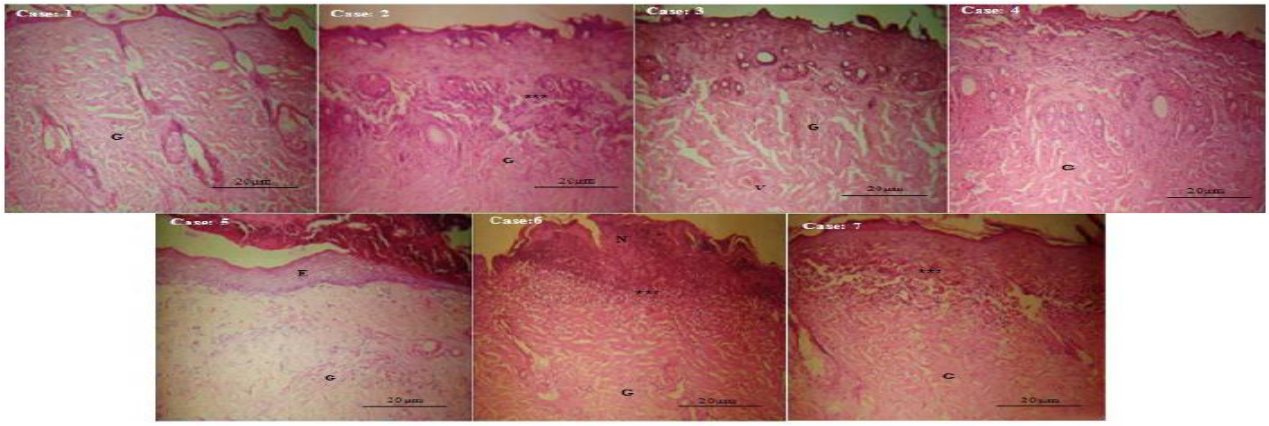

Fig. 2. Photomicrographs of wound sections at Day 4 post-wounding with H&E under the magnification of 400X. Case 1,2,3shows the destruction of epidermal layer with amorphous appearance of superficial part of the dermis. Case 4 shows complete epidermal loss and amorphous appearance of the superficial layer of dermis inflammatory cells were. Cases 5 and 6 shows complete epidermal loss. Case 7 shows complete epidermal loss. Bars on the photomicrograph represent 20 µm. ***: Inflammatory cells; G: Granulation tissue; V: Blood Vessel.

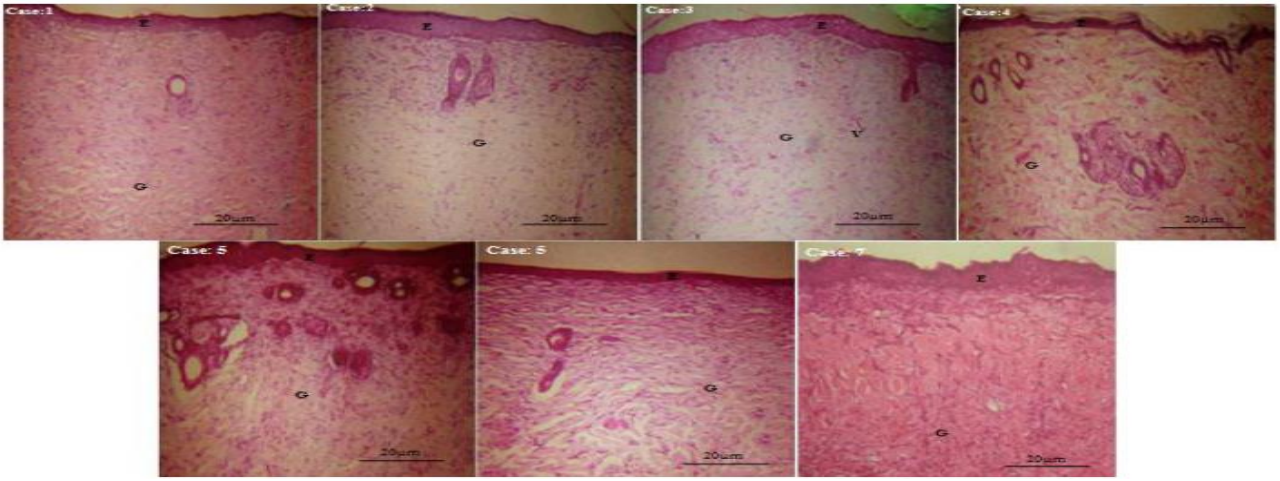

Fig. 3 Photomicrographs of wound sections at Day 20 post-wounding with H&E under the magnification of 400X. case 1,2,3 shows dense granulation tissue. case 4 shows homogenous granulation tissue covered with mature epidermis. Case 5,6 shows homogenous granulation tissue covered with mature epidermis. Case 7 shows dense granulation tissue covered with mature epidermis. Bars on the photomicrograph represent 20 µm. E: Endothelial cell; G: Granulation tissue; V: Blood Vessel.

The cats were not administered with any antibiotics during the period of treatment. The early and healthy granulation tissue proliferation in the wound may be attributed to the prohealing environment provided by the Hanon honey in this study [6, 12, 15, 16]. The present study has shown thatHanon honey can be used as a woundhealing stimulant to promote healing of chronicwound in animals. This is a promising finding because Hanon honey is an inexpensive biomaterial as a skin substitute to stimulate wound healing in animals where cost of treatment is a major.

Conclusion

Honey can be a better wound healing biomaterial in cats. It can be used as a less expensive skin substitute in order to stimulate and promote wound healing in animals.

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