

Insights on Wound Management of Companion Animals

AbdelKhalek Samy AbdelKhalek
Directorate of Veterinary Medicine
General Organization of Veterinary Services
Egypt



COLUMN ARTICLE

Wound healing is the reestablishment of tissue continuity where it occurs through a complex process with well-orchestrated cellular and biochemical events activated at the time of injury [1,2]. In companion animals, the processes of wound healing are interwoven and a clear demarcation between the different phases does not exist. The three broad phases of wound healing process are inflammation and debridement, repair (also called proliferation), and maturation [1].

Clinical experience reveals that there are significant differences in wound healing between mammalian species. Significant differences between cutaneous healing in the cat and the dog have been identified [3]. Also, differences in the anatomy and vasculature of the skin have been recognized in companion animals and other species. Variations in wound healing can be expected. A study in cats indicated that granulation tissue formation is slower in cats compared with dogs (7.5 days in dogs versus 19 days in cats). Granulation tissue originates from the entire wound bed in dogs where granulation tissue appears to develop along the wound border and progressively proceeds over the wound in a centripetal fashion. Comprehensively, the development of granulation tissue, wound contraction, and epithelialization are more delayed in cats than in dogs. Wound epitheli-

alization and complete healing are greater for the dog than the cat over a 21-day period. Wound contraction is also greater in dogs than cats at day 7, but not at days 14 - 21 post-wounding. Consequently, the tensile strength of feline incisions is basically less (about 50%) than canine ones as observed in that study [3]. Moreover, removal of the subcutaneous tissues at wound closure may slow the healing process, particularly in cats. When there is a matter of interest in the completeness of wound healing, skin sutures can be kept in place after the usual time of suture removal. Prolonged retention of skin sutures can result in more prominent suture scars, which may elicit a minor concern in fur-bearing animals. Intradermal skin sutures can provide additional support to skin closures and significantly minimize the risk of wound dehiscence after removal of external skin sutures [4].

Wound healing can be divided into first intention, i.e. the healing of clean, sutured skin incisions, and second intention healing, i.e., the healing of gaping wounds. First intention cutaneous healing has been measured in the cat as part of an overall comparison of cutaneous healing between cats and dogs. Healing of linear sutured wounds was evaluated via tensiometry at 7 days postwounding. Results demonstrate that the wound breaking strength in healing cat skin is significantly inferior to that of dogs. The mean wound breaking strength for the sutured wounds in cats at 7 days postwounding is only one half of the wound break-

ing strength for dogs [3]. This difference must be taken into consideration when deciding the right time for suture removal. Histologic evaluation of skin biopsies reveals that the observed difference in early first intention healing correlated with significantly lower collagen production in cat wounds compared to those in dogs [5]. Knowing the histological characteristics of wound healing is of major importance in understanding the mechanisms behind successful and unsuccessful outcomes of wound healing. An efficient scoring system has to be allowed to obtain a standardized report on the histological findings after any surgical intervention [6].

The wound healing process is not only complex but also fragile, and it is susceptible to interruption or failure leading to the formation of non-healing chronic wounds. Factors that contribute to non-healing chronic wounds are diabetes mellitus, venous or arterial disease, infection, and metabolic deficiencies at older ages [7].

Wound infection, nutrition, abdominal distension, obesity, age and operation time are factors that affect the quality of wound healing but they can hardly be under the influence of the surgeon [8,9].

Wound healing remains a challenging clinical problem. That is why correct and efficient wound management is very essential. All efforts should be exerted on optimum wound care with an emphasis on new therapeutic or technical approaches and the development of new surgical technologies for efficient wound closure such as negative pressure wound therapy, knotless barbed suturing methods, antibacterial-impregnated suture materials, skin flaps, honey-based wound dressings, or nanocrystalline silver dressings [10]. The correct approach to wound management can effectively influence the clinical outcome [2].

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