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Clinical evaluation of keratin-gelatin composite film for wound healing in cats

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The study was aimed to evaluate the efficacy of poultry feather keratin, as an accelerator of wound healing in clinical case of seven cats having non-healing chronic wound. The pattern of wound healing was evaluated both clinically and by planimetry. All cases showed ven; good progress in healing after application of the keratin-gelatin film. The results of the study suggested that keratin of poultry feather acts as a stimulant for wound healing in chronic non healing wounds. Key words: Cat, Keratin, Wound healing.

Keratin is classified as fibrous prot-ein (Sastry et al., 1997; Barone et al., 2005). It is divided into two categories, o-e is soft, which is found in epidermis of the skin (Sastry et al., 1997) and another specialized type of keratin found in feather, hair, nails, wool and hooves (Sastry et al., 1997; Barone et al., 2005). Keratin prepared from the poultry feather can be better utilized as composites and polymers in the field of scientific research (Sehgal et al., 1986; Barone et al., 2005). The use of biomaterials like keratin, gelatin, and basic fibroblast growth factor to promote early wound healing is slowly increasing in the field of medical research. There are no published basic studies describing the use of such biomaterials for cutaneous wound healing in cats (Bohling et al., 2004). The present study was carried out in clinical cases of seven cats with the aim to evaluate the pattern of wound healing using keratin-gelatin film.

Materials and Methods

Keratin hydrolysate from poultry feathers combined with pharmaceutical grade gelatin and keratin-gelatin film was made in 0.2 mm thickness in Central Leather Research Institute, Chennai (Sastry et al., 1985; Sehgal et al., 1986). Seven cats having non-healing wounds were presented to University Veterinary Hospital (UVH), Universiti Putra Malaysia. The signalment of all cats are furnished in Table 1. Earlier, animals were treated using normal saline and povidone iodine for a period of 7-31 days with a course of oral antibiotics but showed no signs of wound healing. Wounds were treated using keratin-gelatin film soaked in Gentamicin solution for 1-2 min (Dutch Farm Veterinary Pharmaceuticals, Netherland). Application was done once in three days, and the wounds were treated with 4-5 applications. Wound healing was assessed by clinical observations, bacteriological examination, and wound planimetry was measured by square counting procedure (Richard et al., 2000). The wound margin at the border between the normal skin and the wound and the outlined area was considered as the total wound, area. Next trace was made along the margin at the leading edge of advancing epithelium. The area between these two margins was considered to be "an area for epithelialization. The area within the margin of advancing epithelium was the area of open or unhealed wound. Percentage of epithelialization, wound contraction and total wound healing was calculated as described by Bohling et al. (2004) in all cases, except in case number 5, which was having fistulous wound with small opening on either end. In that case, the wound area was calculated by the formula used for area calculation in cylinder.

Results and Discussion

Keratin-gelatin film was well tolerated by the animals. No unabsorbed remnants were noticed during the next application. After the first application of keratin-gelatin film, 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 (Romanelli et al., 2002; James and Bayat, 2003) (Figs. 1 and Z). On bacteriological examination, Staphylococcus aureus, Pseudomonas and Klebsiella species from cases 2 and 4 and Pseudomonas from cases 5 and 7 were isolated. Staphylococcus aureus, Pseudomonas, Klebsiella species were the common organisms isolated in wound infection (Rojas et al., 2002; Parker, 2000). Wound planimetry indicated that all the cases showed progress in epithelialization, contraction and wound healing. Contraction ceased when the epithelialization of the wound is completed (Bohling et al., 2004) (Table 2). On