

ULST Timisoara Multidisciplinary Conference on Sustainable Development 30-31 May 2024



EVALUATING LONG-TERM COMPLICATIONS OF SECONDARY INTENTION HEALING IN COMPANION ANIMALS WITH COMPLEX WOUNDS

A. PETEOACĂ, J. MOCANU, A. TĂNASE

University Of Agronomic Sciences and Veterinary Medicine of Bucharest, Splaiul Independenței, 105, Bucharest, Romania

Abstract: Secondary intention healing is a natural wound-healing process that does not involve surgical closure. It is commonly used for complex wounds, especially in the lower extremities of companion animals. This study aims to evaluate the long-term outcomes of secondary intention healing in companion animals, focusing on complications and influential factors. A retrospective study analysed 157 cases treated at the University Veterinary Hospital of Bucharest. The data included details about wound characteristics, treatment protocols, and follow-up evaluations. Patients who met specific wound complexity criteria were included, and follow-up assessments were carried out at regular intervals to monitor healing progress. Complications were classified into three categories: grade 0 (no complications), grade 1 (mild complications), and grade 2 (moderate to severe complications). Grade 1 complications were observed in 6 cats and 5 dogs, predominantly involving limb injuries. Grade 2 complications were noted in 4 cats and 8 dogs, primarily associated with limb injuries. The incidence of complications was relatively low compared to the total population studied, with dogs being more affected. Complications included intermittent epidermal disruption, loss of function, and lameness. Circumferential wounds on lower extremities exhibited a higher incidence of long-term complications, necessitating meticulous management. Injuries involving traumatic amputation or subsequent necrosis of digits and foot pads presented notable long-term challenges, potentially prompting discussions regarding amputation. These findings underscore the importance of comprehensive wound care protocols, early intervention, and continuous monitoring to enhance outcomes in complex wound cases. Further research is imperative to refine treatment strategies and enhance long-term prognosis.

• Introduction

Wound management in companion animals presents unique challenges, with secondary intention healing offering a natural approach. Lower extremity wounds pose particular challenges due to contamination risk, reduced vascularity, and mechanical stress. Complications such as delayed healing and infection are common, with scar formation influenced by wound contraction and epithelialization. The primary goal is to restore function, with various factors influencing therapeutic protocol selection. Understanding the limitations of scar tissue formation is essential for assessing treatment efficacy. This study analyzes the outcomes of secondary intention healing in complex wounds, shedding light on factors impacting long-term prognosis.

• Material and methods

For the data collection, specific criteria were set for record selection. Three main categories of criteria were employed: record related, patient related and wound related.

- Record Selection Criteria:
- Exclusively sourced from University Veterinary Hospital;
- Associated with one of the authors;
- Required complete documentation and long-term follow-up data.
- Patient Selection Criteria:
- Dogs and cats included for homogeneity;
- \succ No restrictions on breed, age, or sex.

Wour	nd Tota	al Dogs	Cats	Limbs	Grade 1	Grade 2
size	case	es			complications	complications
Small	57	28	29	29	2	0
Mediu	im 60	35	25	31	5	4
Large	40	29	11	16	5	7

Wound size distribution

Cases were categorized into two groups depending of the main healing process: epithelialization with 95 cases (60.51%) and contraction with 62 cases (39.49%).

Scar scoring revealed Grade 1 scars in 49.04% of cases, Grade 2 scars in 38.85%, and the most severe scars in 12.11% of cases. Cats and dogs exhibited similar percentages.

The chi-square test results provide valuable insights into the relationships between different categorical variables:

- Complication Grades and Wound Site: A statistically significant association exists (p = 0.0071734), indicating higher complication rates in limb injuries with extensive scars.
- Complication Grades and Wound Size: No significant association (p=0.061029056) suggests wound size may not strongly influence complication severity.
- Complication Grade and Type of Healing: A significant association exists (p= 0.0055358), implying the healing method impacts complication severity.
- Complication Grade and Scar Grade: Highly significant association (p=1.02851E-07) suggests more severe complications lead to more

- **Wound Selection Criteria:**
- > Wounds requiring surgical treatment or multiple dressings;
- Infection, involvement of additional tissues, or systemic complications;
- Healing time exceeding 21 days or immediate dehiscence post-treatment.

Outcome Assessment:

- Complications graded as 0 (none), 1 (mild), or 2 (moderate to severe);
- Wound size categorized as small, medium, or large;
- Scar tissue quality assessed using a grading system.
- Data Analysis:
- Frequency analysis conducted for each parameter;
- Chi-square tests performed to assess correlations between variables.

• Results and discussions

Out of the total cases, 92 (58.60%) were dogs and 65 were cats (41.40%). Of these, 55 cases involved suture or surgical reconstruction along side secondary intention healing, while 102 cases were treated exclusively by secondary intention healing. 134 cases (85.45%) were associated with grade 0 complications, comprising 55 cats (41.10% of total cats) and 79 dogs (85.87% of total dogs).



Distribution of complications by severity

The frequency analysis for the wound site variable showed that 76 cases

severe scarring.



Sequential images demonstrate the complications of a limb wound with significant epithelialization in 2 dogs. A: Initial degloving injury; B+C: Epidermal disruption and bone hypertrophy at 6-month, 8 month and 1 year checkup with grade 3 complications; D: Initial degloving injury; E: Epidermal disruption at 6-month check-up (grade 2 complications); F: Wound scar protective footwear.



Sequential images demonstrate the healing stages of a wound healing with significant epithelialization in 2 cats: A:
Initial burn injury presentation; B: Wound closure with large scaring (grade 3) no complications (grade 0); C:
Epidermal disruption at 1 year check-up grade 1 complications; D+E: Epidermal disruption at 2 months and 6 months check-up (grade 2 complications) in a burn injury cat.

Conclusions

The retrospective analysis provided valuable insights into the efficacy and outcomes of employing secondary intention healing. Complication grades were notably associated with wound site, indicating a higher prevalence in limb injuries with extensive scars. However, wound size did not strongly influence complication severity. Type of healing significantly influenced complication grades, with more severe complications leading to more severe scarring. Extensive wounds in dogs and cats posed challenges, with some cases requiring amputation due to demanding long-term care. Lesions in areas like the trunk healed mainly through contraction, with fewer long-term complications compared to lower extremity scars. Prospective studies with

(48.41%) involved limb injuries, with 37 in cats (56.92% of total cat cases)

and 39 in dogs (42.39% of total dog cases).

larger, diverse samples are needed to further explore secondary intention

