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Wound management – Part 2: postoperative wound breakdown

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ABSTRACT: This is the second article in a series of three individual wound-management case studies. It charts the progress of a surgical wound which suffered the setback of two wound breakdowns, which considerably lengthened the healing time. This article also explores the factors involved in wound breakdown and charts the progress following the second breakdown when the wound was then managed conservatively by maintaining a moist wound environment.

Introduction

'Bobby', an 11-year-old Golden retriever, initially presented with a 2cm intradermal mass on the dorsal aspect of the right hock. As a consequence of patient interference, the surface had become ulcerated. Subsequent fine-needle aspirate biopsies were suggestive of a cyst or a benign adenexal tumour.

Surgery was performed to remove the mass using a large elliptical incision. Histology showed the mass to be 'an area of proliferative and pyogranulomatous inflammation … consistent with pressure or lick dermatitis'. Hence there was a good prognosis.

Following initial surgery, the sutures had been removed because of patient interference and the wound was fully open. Repeat surgery was performed to close the wound. Three days after surgery, the wound began to break down.

The author became involved 20 days after the initial surgery and followed the case through to healing in order to ensure continuity of care.

Case Diary

Day 1

Surgery was performed to remove the mass from the right hock. A monofilament synthetic absorbable suture (Caprosyn Syneture, Covidien) was used subcutaneously and in the skin.
The patient was given an injection of antibiotic, amoxicillin/clavulanic acid (Synulox, Pfizer) and NSAID meloxicam (Metacam, Boehringer Ingelheim).
A five-day course of amoxicillin/clavulanic acid tablets (Clavaseptin, Vétoquinol) was dispensed and the owner instructed to continue with the oral suspension of meloxicam that had previously been dispensed. Both were to start the following day.

Day 4

The patient presented at the postoperative check with an open wound. Despite the use of an Elizabethan style collar, it was thought that the patient had still managed to reach the wound and remove the stitches. The patient
was admitted for general anaesthesia.

The wound was flushed with a sterile saline spray (Auspray, Animalcare) and the area surrounding the wound scrubbed with diluted chlorhexidine (Hibiscrub, Regent Medical Ltd). The wound was undermined slightly and simple interrupted walking sutures placed using absorbable monofilament (PDS II, Ethicon, Johnson and Johnson) to relieve some of the tension. The PDS was then used intradermally and absorbable braided nylon (Nylomade AK, Animus Surgical) was used in the skin.

TABLE 1	Bandage aftercare for owner

The owner was advised to monitor for any of the following signs which may have indicated a problem with the dressing:

- odour
- discharge through dressing
- swelling
- skin irritation/soreness
- lameness
- patient interference

In addition, the owner was instructed to contact the surgery immediately to arrange for re-dressing if either of the following occurred:

- the dressing became dirty or wet
- the dressing slipped from it's original position

TABLE 2	Dressing changes and wound assessment

- Ideal dressing frequency is ~5 days
- Wear gloves when handling an open wound
- Flush the wound with saline (Aquspray, Animalcare)
- Note the following:
  - how easy/difficult it was to remove the dressing
  - wound exudate (colour, smell, volume, viscosity)
  - size of wound (take measurements)
  - stage of wound healing (necrotic, sloughing, granulating, epithelialising)
  - signs of infection (pain, inflammation, increase in exudate, heat, redness, tracking, bleeding easily, heat around wound)
- Based on assessment, decide which is the most appropriate topical dressing to use (honey or a hydrogel)
- Select an appropriate secondary dressing. A hydrophilic foam dressing supports a moist wound environment
- If the wound is on a limb, then the limb should be massaged at each dressing change to encourage blood flow and circulation – particularly important in long-term dressings

Figure 1: Day 21. Note the purple 'bruising' appearance of the skin above the wound (a) and (b). Area of necrotic tissue (c)

The wound was dressed using hydrogel (Cutimed gel, BSN Medical) and a secondary hydrophilic foam dressing (Advasorb Plus, Dechra).

The patient was discharged with written instructions on bandage care (Table 1) and a larger Elizabethan collar. It was also advised that the patient should be on restricted exercise.

Day 6

At the postoperative check up, the wound was cleaned and assessed (Table 2). It was found to be slightly erythemic around the edges. The wound was redressed using hydrogel and a secondary hydrophilic foam dressing (Cutimed Siltec, BSN Medical) to support moist wound healing.

Day 9

On dressing removal, a clear discharge was evident and the wound was still erythemic. The centre of the wound was slightly open, so the veterinarian on duty checked the patient. The popliteal lymph node was found to be enlarged, so the antibiotic course was extended by a further five days.

Medical grade honey (Activon, Dechra) was used (because of the presence of infection and the potential for wound breakdown) and a secondary Cutimed Siltec dressing was again used.

Day 13

The wound had again broken down with a wider central part. The nylon sutures were removed as they were no longer supporting the wound. Healthy granulation tissue was present.

It was decided that the wound would now be encouraged to heal by second intention using advanced moist wound management. Honey and an Advasorb Plus dressing were used to support this. A further seven-day course of Clavaseptin and a seven-day course of carprofen (Rimadyl, Pfizer) were prescribed.

Day 16

The owners were following instructions strictly by keeping the patient restricted and the bandage in good condition. There was no discharge from the wound and healthy granulation tissue was present. A piece of PDS suture was visible in the centre of the wound but was left *in situ*. The wound was re-dressed with honey and Cutimed Siltec.

Day 21

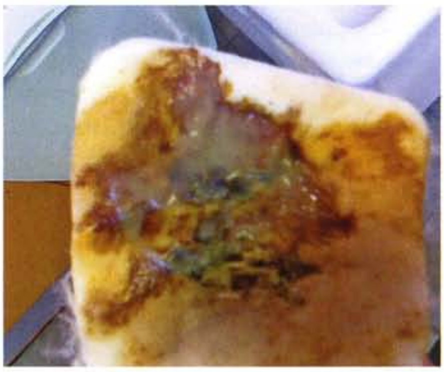
Seventeen days after the second surgical closure of the wound, the case was referred to the author. Upon removal of the bandage it appeared that it had tightened around the hock area. The wound had broken down more extensively than previously, and there were signs of tracking infection indicated by the mottled 'bruising' present in the skin around the wound (Figure 1, a & b).

The granulation tissue was also more purple in colouration (rather than a healthy pink) which may also have indicated a bacterial infection, so a swab was taken for microbiology. An area of necrotic tissue was present and further sloughing was, therefore, expected (Figure 1, c).

Figure 2: Day 21. 'H'-shaped wound

Figure 3: Day 25. Necrotic tissue has been debrided and wound has extended centrally. Over-granulation of tissue

Figure 4: Day 25. Discharge from wound



The wound was 3.5cm x 1cm laterally and 2.9cm x 1.3cm dorsally (Figure 2). The vet changed the antibiotics to a seven-day course of clindamycin (Antirobe, Pfizer) and cephalexin (Rilexine, Virbac) as well as an eight-day course of carprofen.

The wound was re-dressed using honey, which would continue to aid in the debridement of the necrotic area, plus a secondary Cutimed Siltec dressing. The author also chose to pad the dressing using cotton wool instead of commercially available, ready rolled padding material as it was felt that the cotton wool would provide more adequate padding in this case and extra was used around the hock area.

The client was advised that, in its present state, the wound would take a minimum of three weeks to heal, taking into account the further sloughing that needed to occur. It was also to be expected the wound might enlarge before the healing process began.

Day 25

The wound was 'over-granulating' and bled easily, which was also another indication of infection (Figure 3). The necrotic area present at Day 21 had debrided. Thick discharge was present (Figure 4). The centre of the wound had extended.

The wound was re-dressed with a honey and hydrogel 1:1 mix plus a secondary Cutimed Siltec dressing. The overall size of the wound had increased to 3.9cm x 1cm laterally and 4.1cm x 2cm dorsally with an overall width of 3cm.

Microbiology reported the presence of *Pseudomonas aeruginosa*, which is naturally resistant to the majority of antibiotics commonly used in practice. Sensitivity to marbofloxacin (Marbocyl, Vétoquinol) was shown on the report, so the vet prescribed a 10-day course which was dispensed on Day 26.

Day 29

Only a small amount of discharge was present in the dressing and the wound was improving. The granulation tissue and tracking infection had both reduced (Figure 5). Both aspects of the wound had reduced in length by ~1cm to 2.8cm laterally and 3cm dorsally. Fragile scar tissue was present at the distal aspect of lateral wound.

Figure 5: Day 29. Wound much improved

Figure 6: Day 34. Dorsal wound aspect

Figure 7: Day 34. Lateral wound aspect. Healing was much faster as the wound was contracting well

Day 34

A good improvement in wound healing was evident. The dorsal aspect had improved and there was no sign of tracking infection (Figure 6). The lateral wound was contracting well and was almost fully healed (Figure 7). The granulation tissue was still a dark purple colour, so the antibiotic course, marbofloxacin, was extended by another 10 days.

Day 40

The wound had now started to split into two and both were contracting well

Figure 8: Day 40. Wound has split into two. Dorsal aspect now contracting well

Figure 10: Day 51. Wound fully healed. Large area of fragile scar tissue present

Figure 9: Day 46. Only a small superficial wound present on dorsal aspect

Figure 11: Day 70. Hair re-growth and large reduction in scar

(Figure 8). The owner was keen to reduce the dressing size and increase exercise. The author advised against this, as even though the wound was healing very well, any increase in movement of the area could hinder progress and potentially cause the wound to break down again.

Even though the lateral side was doing so well, the fragile scar tissue was still susceptible to breakdown, so it was advised to continue with the same routine of re-dressing and restricted exercise.

Day 46

Only a very superficial wound remained on the dorsal aspect, 1.1cm x 1.1cm (Figure 9). After discussion with the owner it was decided at this stage that a lighter dressing, excluding the foot, could be used and the patient was allowed a slight increase in exercise.

The wound was dressed with a 3:1 mix of hydrogel:honey.

Day 51

The wound was fully healed (Figure 10). A large purple scar was present.

Day 70

The owner returned for the benefit of the author so she could assess the progression of scar formation. Hair regrowth was present and only a much smaller scar remained (Figure 11).

Discussion

This was an unusual-shaped wound, and this case demonstrates well the importance of taking photographs and measurements. Improvements can be seen clearly and recorded for reference, and this gives a good indication as to how the wound is progressing. This is of particular importance if a different veterinary nurse sees the patient on each examination. Although I would always advocate continuity of care, it may not always be possible.

Factors that may delay healing or contribute to wound breakdown should always be considered. Patient interference – as happened in the initial stages of this case – is in theory avoidable with the use of appropriately sized collars; but sometimes patients can surprise us if they are determined to gain access to a wound.

Location of the wound is also a factor, 'Wound complications are more commonly seen in areas of high-motion, such as over a joint. The distal limb also has particularly tight skin which results in extra tension being placed on a surgically closed wound, or reduces the wound's ability to contract if healing is by second intention'.[1] This was demonstrated in this case by the faster healing time of the lateral aspect of the wound.

There may be an indication for prophylactic dressings postoperatively to support the area and reduce mobility. These can also act as an extra barrier against patient interference and infection.

As the presence of infection also delays healing, swabs taken from a non-healing wound are indicated to assist in the correct choice of antibiotic. However, bacteriological findings should be interpreted in conjunction with the gross wound assessment, as the findings may not always be clinically significant.

The importance of the role of the veterinary nurse in wound management should not be underestimated. It is a clinical area in which veterinary nurses can become actively involved, especially as they can often dedicate more time to the process during standard consulting times than can a veterinarian surgeon.

It should not be unusual for a veterinary nurse to spend 20 to 30 minutes on a case like this. The more experience a nurse can gain with different wounds, the easier it becomes to recognise different wound stages and detect signs of infection and complications. This will ensure that the wound is encouraged to heal in the fastest time possible, because changes to the wound-care programme can be made when needed.

There is no standard care protocol for every wound. At each dressing change, the wound should be assessed and an appropriate course of action taken depending on the findings. This may range from simply deciding to change the type of topical or secondary dressing used, to taking a swab for microbiology.

If any complications are found then decision-making on the best course of action is done under the supervision of the veterinary surgeon so that any necessary treatments can be prescribed or surgical procedures undertaken (e.g. antibiotics or wound debridement).

The ability to communicate your findings and reasons for your choice of treatment with the owner will help build trust and ensure good continuity of care and compliance.

In this case, the owners were very involved in the patient's care and followed all advice given. This contributed to the healing of the wound. It even extended to the point of carrying Bobby when necessary to reduce any movement on the leg. Truly dedicated owners considering his size (Figure 12)!

Reference

1. WILLIAMS, J. and MOORES, A. (2009) Manual of Canine and Feline Wound Management and Reconstruction Second Edition. British Small Animal Veterinary Association, Gloucester.

Figure 12: Bobby!

NEWS REVIEW by Jean Turner

'Get Fit with Fido Challenge'

Health and fitness expert, Rosemary Conley CBE, has teamed up with the Kennel Club once again to launch a competition that encourages dog owners to enlist their canine companions to help battle the bulge.

The Kennel Club's Get Fit With Fido Challenge runs until 15th July and rewards the dog and dog owner who jointly lose the most weight, and the dog owner and dog who individually lose the most weight, with the help of exercising together.

Rosemary Conley says: "Statistics from the NHS show that over 60 per cent of human adults in the UK are overweight or obese, highlighting the need for action. People are not getting the exercise that they need but a small change can make a huge difference.

"Dogs can be great fitness partners for those trying to lose weight and by simply increasing the length of walks, owners and dogs can improve their health and fitness together."

Prizes on offer include a makeover and photo shoot with Rosemary Conley Diet and Fitness Clubs www.rosemaryconley.com, tickets for the Kennel Club's Crufts and Discover Dogs events and a £100 discount voucher for www.lintbells.com. To find out more, visit www.thekennelclub.org.uk/getfitwithfido.

Nurses should be managing osteoar

Six hundred vets and vet nurses attending the 'Excellence in Multimodal Osteoarthritis Management' CPD events at the end of last year – organised in a collaboration between Pfizer Animal Health and Hill's Pet Nutrition – heard that the key challenge of osteoarthritis is how to manage it.

Leading experts, Professor Stuart Carmichael, Professor John Innes and David Prydie, presented the latest thinking on the disease and veterinary nurses were presented with a toolkit of ideas for managing osteoarthritis.

Stuart Carmichael explained why management of the disease is so important. 'We know osteoarthritis is very common because we see it all the time,' he said. 'Yet there is still an underlying notion that it is a poorly treated disease. This is probably because of the very nature of the condition. It's a chronic, incurable disease which presents when two different forms – an acute flare-up and chronic disease – occur together.

'Using a multimodal management scheme allows the identification of treatments that are different in their attack but also synergistic. By using a combination of approaches, it means dependence on one treatment method is reduced. Vets can identify which areas are important by following a six-point plan (Table 1) to develop a management strategy for osteoarthritis.'

David Prydie explained how vet nurses could become involved in managing osteoarthritis and working alongside vets by running nurse clinics and focusing on the dog's diet and exercise. 'Weight management is a priority in treating osteoarthritis and owner motivation is key in this area,' he said. 'Owners need to see 0.5 per cent to 1 per cent weight loss per week to stay motivated but, in reality, it is generally six weeks before owners see an improvement, so it is essential to keep them motivated with progress charts.'