

Equine Wounds

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This essay will be confined to generalised soft tissue (not bone fractures) wounds of the equine distal limb that may or may not require surgery but will require prudent wound management. It is not intended as a complete treatise on the subject by any means but an attempt to encourage a better understanding of care for our horses when suffering from injury.

Horses are by nature fright-flight animals and are commonly subjected to trauma, accidentally or by deliberate acts of surgery. The distal limbs are particularly prone and any penetration or skin tear may present as a portal of entry for infection and hence a complication to healing and, at worst, even euthanasia. Figure 1 illustrates a life threatening distal limb recalcitrant infection of a young filly that was 5/5 lame. A small primary wound was identified that was initially considered of little consequence by the owner.



Figure 1

A small penetrating wound below the fetlock resulted in sepsis of the flexor tendons, tendon sheath, and other associated anatomical structures. Due to failure of conventional medical and surgical treatment, radical salvage surgical intervention was indicated (Figure 2, 3 & 4).

Wound repair is, at best, a well-orchestrated, complicated sequence of events where the final outcome is 'self-repair'. Unfortunately healing may stall for a plethora of reasons and this is seen too frequently due to poor

wound management. Geographic location can also play an important role, for example, where a simple laceration at a racing precinct may be more likely to become infected by an antimicrobial resistant organism than if the same incident had occurred in a country paddock.

All distal limb wounds should not be underestimated and should be treated without delay including primary closure by suturing where possible. If the skin edges can be apposed (pulled together) and the sutures hold then the wound will heal quicker (by first intention). If first intention healing is not possible, for example due to significant tissue loss or chronicity, then the wound is left to heal as a partial or full thickness 'open' wound (by second intention).

There are several phases of wound repair, the initial phase being inflammation. This is followed by the formation of red fleshy granulation tissue (Figure 2). This granulation tissue fills the defect and helps to resist infection. Eventually the cellular content alters with time and wound contraction commences. Contraction is a most important event as the skin edges are drawn centrally from all sides (Figures 3 & 4) over the wound bed



Figure 2

Surgery (tenosynoviotomy and extensive debridement) and good wound management returned this filly to full recovery. 13 days post-surgery, healthy red, fleshy granulation tissue is evident and should not be interfered with but covered by an appropriate wound dressing.



Figure 3

Contraction, new skin (epithelialisation), new blood vessel formation (angiogenesis) and remodelling of the wound eventuate.



Figure 4

Further contraction, more new skin (epithelialisation) and remodelling is still ongoing.

To achieve successful wound healing, basic requirements must be met, including good initial preparation of the wound, maintaining good patient

general health, cleanliness (asepsis, sterility), reduced mobility or complete immobility (apply cast and stable rest), ongoing bandage change and administration of an assortment of medications managed as required throughout. Tetanus vaccination and the choice of drug therapy will depend on the attending veterinary surgeon. A basic understanding and commitment by the owner is also necessary.

An important family of enzymes (chemicals that facilitate biological reactions) known as proteases (serine proteinases and matrix metalloproteinases (MMP's)) are believed to play a very important role in wound healing. As with most things in nature a healthy balance is required where, in this instance, it is between degradation and formation of a healthy matrix of granulation tissue (Figure 2). If this balance is disturbed then wound healing will stall. That is, if there is too much serine proteinase or too much MMP's then there will be too much inflammation mediated tissue destruction within the wound. This wound chronicity would need counteracting with medications such as tetracycline, having anti-proteinase activity.

Wound chronicity (failure to heal) is frequently due to contamination with pathogenic bacteria (bioburden). Once bacteria attach to a wound this bioburden can quickly produce slime or biofilm, particularly in immunocompromised or undernourished horses, and the consequences can be vast. A reduction of vitamin D (controls the innate immune system) is one such after-effect.

How to treat equine wounds has been the subject of numerous text books, scientific papers and debated for centuries. In the event of trauma, the seriousness will depend on what anatomical structures are involved and a veterinary surgeon will normally need to be consulted for this determination and subsequent treatment.

Notwithstanding the age of the wound when first observed, the area should be clipped and the wound decontaminated and dressed. To achieve this may necessitate sedation, local anaesthesia or even general anaesthesia. The wound may need debridement (removal of foreign material and devitalised tissue) and sutured where possible. Skin deficit and tension are frequent problems of distal limbs and a reliance on eventual wound contracture (as described above) can be the saving grace. It is my assertion that to achieve healthy balanced granulation, epithelialisation, angiogenesis and remodelling then a commitment to bandaging is required until final healing. I am not in favour of leaving wounds "open to the air". I also refrain

from removing “proud flesh” (exuberant granulation tissue) unless it is diseased (unhealthy) and obviously stalling (impeding) healing (Figure 5 & 6).



Figure 5

Healthy red, fleshy exuberant granulation tissue (“proud flesh”) was left alone and disappeared following ongoing bandaging.

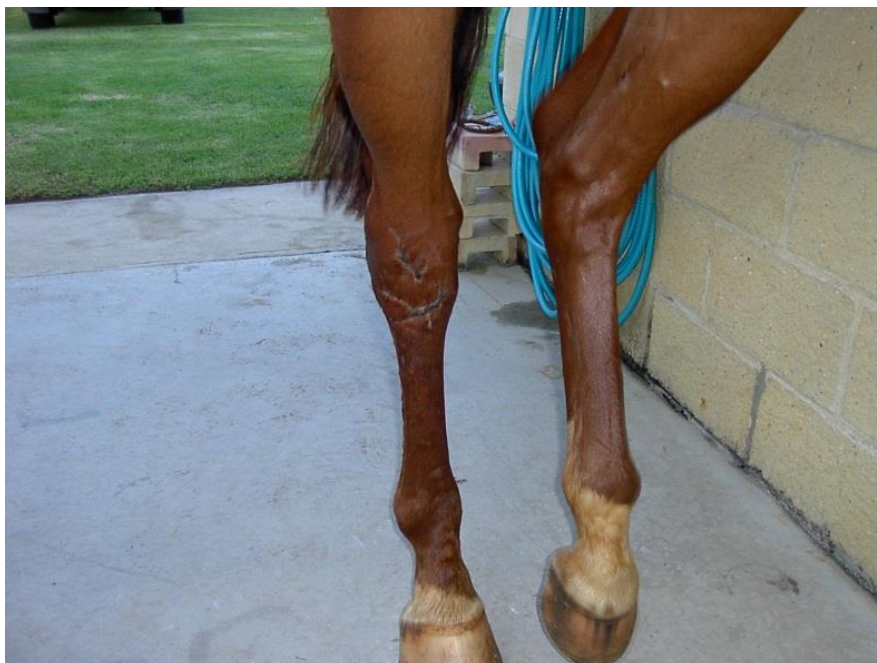


Figure 6

Final healing after constant re-bandaging

Typical bandaging techniques are depicted in Figures 7 & 8.



Figure 7



Figure 8

On a final note, iodine seems to disrupt biofilm and has been found to be most useful in wound treatment. It comes in various forms and can be administered topically (povidone iodine), orally (potassium iodide) or by injection (sodium iodide). It is however cytotoxic (will stop division of cells and kills cells) and hence should be used under veterinary supervision. Disruption of biofilm allows other antimicrobial drugs to have effect.

The stage of wound healing along a time line from Day Zero will determine the management strategy. Cost effective topical medications such as Savlon Antiseptic Cream, Silvazine/Flamazine and terramycin powder (oxytetracycline HCl 20mg/g in non-irritant carrier) are commonly used in association with the judicious use of non-steroidal anti-inflammatory drugs (NSAID's), antimicrobials and anticoagulant. The haphazard use of drugs, particularly antibiotics and NSAID's should be avoided. The horse's welfare is paramount and every step along the way should be carefully thought through and not left to chance.