Papillomatous Digital Dermatitis

a.k.a. “Hairy Heal Warts”

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Clinical Signs

• Primary clinical sign is severe lameness
  – Toe-touching lameness, three-legged lameness, or shifting-leg lameness if more than one foot is involved
  – Most often localized to the hind feet, but can involve front feet as well
  – May also see:
    • Drop in milk production
    • Reduced body condition
    • Unwillingness to walk from a soft substrate to a concrete surface
Pathology

• Two types of lesions typically seen
  • Likely a continuum of pathogenesis
    – Erosive/reactive
      • Early lesions appear similar to abrasions
        – Flat, red, and painful lesion with clear margins
        – Often found in the skin proximal to the heel bulb
      • Long hairs develop at the margins of the lesion in intermediate stages
Pathology continued

• Proliferative
  – Lesion takes on a warty appearance in later stages
    – Raised papillae develop with chronicity
Pathogenesis

• Lesion likely initiated by infection with *Treponema* spirochetes*
  – Exact virulence factors currently unknown
  – Certain combinations of *Treponema spp.* more virulent than others
  – High numbers of *Treponema* found at the junction between diseased and healthy tissues

• Viral component hypothesized, but unsubstantiated so far
  – Especially with proliferative lesions

*Nordhoff et al, 2008*
Differentials

• Primary differential is digital dermatitis, a.k.a. “Footrot”
  – Deeply ulcerated lesions may have a Fusobacterium component
  – Footrot usually has associated fever and swelling, heel warts typically do not
  – Footrot is often located in the interdigital space

• Early lesions may look like a traumatic abrasion on initial examination
Treatment

• Thorough cleaning of the lesion, followed by bandaging and topical oxytetracycline for 3-5 days may be sufficient
  – repeated bandaging/topical oxytet is often required for full resolution
  – Typically does not result in detectable levels of tetracyclines in milk
  – Severe lesions may benefit from IV administration of high doses of oxytetracycline
Etiology

• Exact etiology unknown
  – Spirochetes believed to have a major role in pathogenesis
    • Primarily *Treponema spp.*
      – PCR-confirmed in 100% of samples from acutely affected cattle in one study*
  – Several anaerobes associated with PDD lesions
    • *Fusobacterium, Porphyromonas, Prevotella, Guggenheimella*
    • Likely secondary invaders

*Nordhoff et al, 2008*
Epidemiology

- Can affect any breed or age group
  - Young animals with a poor immune response most susceptible
- Introduced to the farm through purchase of infected replacements, or mechanical vectors (hoof trimming equipment, boots, veterinary instruments)
- Lesions most often on the palmar/plantar aspect of the hind feet, proximal to the heel bulb
  - Can affect front limbs/other aspects of the hoof
Prevention

• Farm hygiene
  – Maintaining a dry living environment
  – Frequent slurry removal

• Footbaths
  – Copper sulfate may be more effective than formalin, and as effective as some proprietary commercial products*
  – Improperly managed footbaths may spread the disease within a herd
    • Organic matter contamination
    • Improper concentration of disinfectant

  – Very little data so far on efficacy of footbaths in prevention of PDD

*Teixeira et al, 2010
Economic Impacts

• Reduced milk yield due to lameness
  – Can be 350 – 1210 lbs of milk per cow, per lactation, in lame cows (not PDD specific lameness)*
  – 0.44-2 billion lbs of milk nationally due to PDD alone**
  – May also lead to reduced fertility, increased culling

• Production losses due primarily to reduced feed intake

*Green et al., 2002
**Losinger, 2006
References

- Merck Veterinary Manual, online www.merckvetsmanual.com
- University of Pennsylvania, College of Veterinary Medicine – computer aided learning, online <research.vet.upenn.edu/fieldservice>