1993

Bovine Toe Abscesses

Dale W. Miskimins
South Dakota State University

BOVINE TOE ABSCESSES

Dale W. Miskimins[1]
Veterinary Science Department/Animal Disease
Research and Diagnostic Laboratory

CATTLE 93-16

Summary

Toe abscesses were diagnosed in five Midwestern feedlot lameness outbreaks submitted to the Animal Disease Research and Diagnostic Laboratory during the 1992-93 winter. Affected cattle developed severe lameness from 3 days to 3 weeks after feedlot arrival. Close examination of feet revealed abnormal hoof wear, separation of the hoof wall from the sole, and drainage and swelling of affected feet. Treatment of the problem included corrective foot trimming to allow drainage and antibiotic therapy. Causes of the problem included abrasive and traumatic injuries which allowed bacteria to infect the foot. Hooves were softer and more prone to damage because of unusually wet weather conditions the previous summer and fall. Prevention tips include bedding rough surfaces and preventing traumatic foot injuries.

Key Words: Lameness, Toe Abscess, Infection

Introduction

An unusual lameness problem was observed in scattered Midwestern feedlots during the winter of 1992-93. Severe lameness developed several days to three weeks postarrival. Hind feet were usually affected, but front feet could also be involved in severe cases. Affected calves were gaunt and reluctant to move. Response to treatment was poor and some animals eventually died. Calves or tissues were submitted to the Animal Disease Research and Diagnostic Laboratory, Brookings, SD, for diagnostic assistance from five feedlots.

Materials and Methods

Calves and/or tissues with toe abscesses were received from five different feedlots with complaints of lameness problems during the winter of 1992-93 (Table 1). The calves were necropsied and affected feet were split on a band saw. Various tissues were collected for bacteriology, virology, histopathology, parasitology, hematology, and toxicology exams according to the decisions of the pathologist on duty. Cases selected for the study demonstrated variable degrees of abnormal hoof wear, separation of the sole from the hoof wall, and inflammation of the corium (vascular layer between the hoof wall and third phalanx [coffin bone]).

Results and Discussion

Toe abscesses have not been widely described in the literature. One previous report was found in the popular press describing toe abscesses in Kansas feedlots. Cattle examined in this study came from different feedlots in the region served by the lab (Table 1). The origins of the affected calves included South Dakota and Montana. Various breeds were affected. Lameness developed from a few days to three weeks after feedlot arrival. Weights ranged from 500-700 lbs. The cases were presented to the lab between December and March. Morbidity ranged from a few animals up to 75%. Mortality was 7% in the worst group. Affected calves failed to gain and often finished behind penmates.

---

[1]Assistant Professor.

Table 1. Toe abscess cases, 1992-1993

Case	Tissues/animals received	Feedlot location	Morbidity, %	Mortality, no.
1	1 live calf	SD	30	12
2	1 dead calf/amputated toe	IA	75	8
3	2 live calves	SD	1	2
4	3 dead calves	SD	1	3
5	2 feet	NE	5	2

Case	Bacteria isolated	Other lesions
1	*Actinomyces pyogenes*	Cellulitis, lung abscesses
2	*A. pyogenes/Bacteroides melaninogenicus*	Arthritis, tendinitis
3	*A. pyogenes/B. melaninogenicus*	Osteomyelitis, arthritis, lung abscesses
4		Sloughed hoof, osteomyelitis
5		Osteomyelitis,, nephritis

Clinical symptoms included severe lameness in affected legs. The lateral claws of the hind feet were most commonly affected, but medial hind claws and front feet also had lesions in some cases. The calves were usually gaunt and reluctant to move. Early examination of affected animals revealed abnormal wear of the hoof, extreme tenderness of affected digits, and elevated temperatures. As the problem developed, swelling developed at the coronary band, and separation of the hoof wall and sole at the white line occurred. Untreated calves sometimes sloughed toes. Infection spread up the legs causing arthritis and cellulitis in some cases. Additional spread of infection to internal sites occurred in three of five cases.

Splitting the affected digits on a band saw revealed internal lesions including laminitis, osteomyelitis of second and third phalanges, arthritis, tendinitis, cellulitis, necrosis and abscessation of the third phalanx (P3), and sole abscesses.

Of the three cases cultured, *Actinomyces pyogenes* was found in affected digits, and *Bacteroides melaninogenicus* was found in two of the three cases. *A. pyogenes* and *B. melaninogenicus*, spread from infected feet, were isolated from the lung of one calf. Two cases were not cultured. These bacterial isolates are commonly found in suppurative processes of cattle. It is interesting to note that *Fusobacterium necrophorum*, a common isolate in footrot, was not identified.

No viral agents were identified in the tissues submitted. Liver selenium in one case was high, but not in the toxic range.

Weather conditions were unusually wet in the region last year. These conditions tended to soften hoof walls. When cattle were sorted, processed, or on rough abrasive surfaces, the hooves were quickly rasped away. As the wall of the hoof was worn away, the vascular area was exposed, providing an ideal portal for bacteria to enter the foot. Bacteria sometimes ascended the

leg, following along vessels causing abscesses and cellulitis along the way. The sudden turning movements used by cattle when sorted may lead to tearing and separation of the hoof wall from the sole and further white line abscessation. Standing for excessive periods (during trucking) and other traumatic events will lead to softening of solar horn and solar hemorrhage. The hemorrhages in the horn form a point of weakness which can lead to solar penetration, sole ulcers, or white line abscessation. Rough, uneven concrete surfaces may also traumatize the feet leading to infection and abscessation.

Treatment of affected animals may include trimming toes to assist in drainage of exudate and antibiotic therapy. Early treatment is imperative because chronic infections respond poorly to treatment. Foot injuries can be reduced by handling cattle as quietly as possible, by sorting and processing cattle on dirt or deep sand, by replacing damaged surfaces, and by getting an accurate diagnosis for lameness problems.