

# Tetanus in a Crossbred Steer

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## Introduction

While serving on a preceptorship in the fall of 1987, the author of this case review assisted a practitioner in southwestern Missouri in his mostly bovine medicine and surgery practice. This report is based on an observed case and will discuss history, clinical findings, differential diagnosis, therapy, and a summary.

## History and Course

An approximately seven month old, 200 kg crossbred steer was presented September 17, 1987 with the primary complaint of "worms and ain't doing good." The owner was an elderly man suffering from poor health who bought weaned stocker calves to put on native pasture and sell as 450 to 545 kg. There were thirty-eight steers on this pasture varying in size from 180 to 385 kg. The cattle were checked twice daily and generally well taken care of.

The affected steer had been castrated with an elastrator band two and a half weeks prior to this date. The steer was weak, depressed, and frequently kicked at his abdomen. There was a dark bloody discharge between his hind legs and flies were obviously irritating the steer's scrotum. The steer was darted with 175 mg Zylazine and examined.

Rectal temperature was 103.5° F, heart rate 90 beats per minute.

The scrotal area was greatly swollen, a dark blood exudate was present as well as large numbers of fly larvae.

The castration wound was washed well with betadine solution and a screw worm and fly spray was applied to kill the fly larvae.

Intramuscular injections of the following were administered:

Flo-cillin	10cc
LS - 50	10cc
Oxytetracycline	20cc
Vitamin A	5cc

A subcutaneous injection of 3cc Ivomec was also given.

The steer was allowed to recover from the sedative effects of Xylazine under a shade tree.

On September 14 (3 days post) the owner called complaining that the dart's effect had not worn off and his steer was in the barn and down with his head caught under a hay manger.

On arriving at the farm we found the steer as the owner

had described.

Rectal temperature was 102.5° F, heart rate 110 and the steer was obviously severely stressed.

We pulled the steer out from under the hay manger for further examination. Marked extensor rigidity of all four limbs was present as well as opisthotonus and an elevated tail head.

Slight abdominal distention was present which was most likely due to ruminal tympany.

A neurological exam showed a normal menace response and marked ventral strabismus of both eyes. Prolapse of both nictitating membranes was also seen.

The steer was lifted and he had a typical saw-horse stance. When he moved it was a side-to-side motion and muscular spasms would begin. The steer's head and neck was extended and the ears were held erect and pulled toward his poll.

## Differential Diagnosis

- 1.) Tetanus—based on history, castration method and typical clinical signs presented.

Other differentials causing recumbency, opisthotonus, and extensor rigidity of bovine species include:

- 2.) Rabies
- 3.) Polioencephalomalacia
- 4.) Thromboembolic meningoencephalitis
- 5.) Lead or strychnine poisoning
- 6.) Organophosphate poisoning
- 7.) Listeriosis
- 8.) Choke
- 9.) Nervous coccidiosis
- 10.) Grass tetany

Several of the differential diagnoses would require further laboratory testing at considerable cost to the owner relative to the value of the steer. Therefore, in this instance, the veterinarian was confident that tetanus was the correct diagnosis.

## Therapy

An intravenous injection of 20,000 units of tetanus antitoxin was given. Though neutralization of the toxin, once bound within the central nervous system, is impossible, antitoxin is valuable for binding any circulating toxin.

Flo-cillin was administered at a dose of 36,000 IU/kg IM and the steer was allowed to remain in the barn free to move around.

Before we left the barn, we made sure the steer could reach the water trough and hay placed about shoulder level for him.

September 15 (4 days post) the owner called stating the steer was down again. The man's son was bringing the steer to the clinic for us to treat and care for. When the steer arrived in the trailer he was down and very stressed. He was allowed to rest for a couple of hours before we stood him up.

For the following fifteen days we diligently stood the steer up daily and kept food and water available. He was treated every other day for a total of four times with 36,000 IU/kg IM Flo-cillin. By September 28 (17 days post) the steer was able to lay down normally and get up on his own. The owner was called to come and pick up his animal. The cost of treatment and care totaled \$50.00.

### Discussion

Tetanus is a disease characterized by increased muscular rigidity and death in affected animals. All mammalian species have been reported as being affected by tetanus with cattle being relatively resistant to infection. The spores of *Clostridium tetani* are commonly found in soils of agricultural areas, especially where horses have been pastured. *C. tetani* has even been cultured from feces of unaffected cattle. Infection is most often associated with the contamination of wounds, particularly following such operations as castration or dehorning. The veterinarian at this practice had seen six cases of bovine tetanus in his nearly eleven years of practice and all but one were associated with castration using elastrator bands. The one exception was in a newborn calf and it is believed that infection developed from a navel infection.

Tetanus is really more of an intoxication than an infection. This is because the clinical signs presented are due to the actions of three exotoxins produced once active growth of the organism ceases. Of the toxins released,

tetanospasmin has the greatest role in producing the clinical signs. The central effect is to block postsynaptic inhibitory impulses of the spinal motor neurons. Released toxin is taken up by the local nerve endings and migrates up the nerve fibers to the ventral roots of the spinal cord. Increasing numbers of efferent nerves become involved, as the toxin spreads in the cord, causing larger muscle groups to become rigid. Peripheral effects of tetanospasmin result from the failure of synaptic sites to release acetylcholine.

A second toxin, tetanolysin, enhances the multiplication of the *Clostridium tetani* by increasing necrosis of tissue and providing the anaerobic environment needed for such growth. The third toxin, nonspasmogenic toxin, is known to be produced but its role is not well-defined.

**Diagnosis of bovine tetanus is largely based on clinical signs and history. One should always consider a differential diagnosis of rabies with nervous system signs in cattle.**

Vaccination of cattle is usually not considered unless an outbreak of tetanus has occurred in the immediate past and further cases may be anticipated. The cost of treatment, the value of the animal, and the fact that tetanus is a sporadic disease would not warrant an annual vaccination program.

Even though cattle are highly resistant to tetanus infection, the disease is often fatal due to respiratory failure. Recovery is a slow process requiring several weeks to months for complete resolution of signs. However, tetanus must have a guarded prognosis, early recognition and getting the animal to stand after the initiation of therapy may warrant a more favorable prognosis.

### References

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