

Student Clinical Report

Editor's Note: The AABP Board of Directors, meeting in Washington, D.C. on July 21, 1980, approved a recommendation from the Forward Planning Committee to encourage veterinary medicine students to present case

reports for publication in this journal. Prizes of \$200, \$100 and \$50 are awarded for the top three reports. This year, the paper published below, by Fred Metzger, Jr., merits the \$200 prize.

Tetanus in a Prepartum Dairy Heifer

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Introduction

During the summer of 1984, the author of this case review was employed as an assistant by a practice dealing mainly with bovine medicine and surgery in the central Pennsylvania area. Consequently, this report stems from an observed case and will follow the logical manner of discussion involving: history, clinical findings, differential diagnosis, laboratory data, therapy, and a summary.

History

A two year old approximately 1100 pound Holstein heifer was presented on May 29, 1984 with the primary complaint of chronic bloat. The owner was a local "hobby" farmer who kept 16 dairy cows in his back lot. Management was always a problem on this particular farm, for cows continually stood in mud and sanitary conditions were neglected. This particular farm also had a recurring problem with coliform mastitis and high bulk tank leucocyte counts.

The affected cow had been stomach-tubed several times in the seven days prior to calling for veterinary service. The owner had administered one gallon of mineral oil three days previously without any signs of improvement. This heifer also had signs of foot rot and was due to calve in three weeks.

Clinical Findings

Upon initial inspection, it was obvious that the heifer was recumbent, dyspneic and cyanotic.

Rectal temperature was 103.8°F, heart rate, 110 beats/minute and the cow appeared mildly dehydrated as evidenced by her slightly sunken eyes.

Marked abdominal distention was present, most likely due to ruminal tympany.

Her mammary glands were developed to a point consistent with the breeding date, being neither hot or hard.

Marked extensor rigidity was present in all four limbs;

opisthotonus and an erect tail were also evident.

Neurologic examination revealed a normal menace reflex, marked ventral strabismus of both eyes, and the pupils were widely dilated and unresponsive to light. Prolapse of both nictitating membranes was also seen.

Palpation of the limbs revealed a markedly swollen left stifle area and a deep laceration healing by second intention.

Differential Diagnosis

1) Tetanus—considered in light of the history and classic clinical signs present.

Other causes of recumbency, opisthotonos and extensor rigidity must also be considered:

- 2) Polioencephalomalacia
- 3) T. E. M. Thromboembolic meningoencephalitis
- 4) Lead poisoning or organic phosphates
- 5) Rabies—think rabies first!
- 6) Listeriosis
- 7) Nervous coccidiosis
- 8) Grass tetany
- 9) Choke

To definitely rule out the diseases above, laboratory tests should be done. The veterinarian was confident this was tetanus, but felt he should at least run a CBC to cover his bases. Other tests that could be run include a biochemical profile +/- or C.S.F. analysis; however, client economics made these tests unfeasible.

Whole blood was sent to a diagnostic laboratory for lead analysis.

Laboratory Data

CBC—results

Parameter measured	Value
1) PCV	40%
2) Hemoglobin	15.3 g/dl
3) RBC's	8.5 Million/ μ l
4) MCV	44 Femtoliters
5) MCHC	40,8 g/dl
6) RBC Morphology	Normal
7) Total WBC's	9,800/ μ l
- Bands	98 (1%)
- Seg. Neutrophils	8,134 (83%)
- Monocytes	294 (3%)
- Eosinophils	294 (3%)
- Basophils	0
8) WBC Morphology	Normal
9) Plasma Protein	8.1 g/dl
10) Platelets	Normal

Elevated PCV and plasma protein were consistent with the clinical signs of dehydration. Toxemia was ruled out for the total WBC was normal. Lymphopenia and neutrophilic leucocytosis were probably stress related.

Lead Analysis of Blood—Negative.

Ruling Out Diseases in the Differential

- 1) CBC for the most part rules out toxemia.
 - 2) Rabies, polio, and grass tetany are not usually associated with prolapse of the third eyelid.
 - 3) Choke was ruled out for no interference was found on stomach tube passage.
 - 4) Whole blood lead analysis revealed no elevation; consequently lead poisoning was discounted.
- Consequently, the diagnosis of tetanus was based on clinical signs and ruling out other diseases.

Therapy

Because of the rumen tympany, stomach tube passage was attempted before anything else. The veterinarian wore heavy rubber gloves and told me never to use uncovered hands in the mouth of an animal with these signs (think rabies first!). Unfortunately, the heifer's jaws could not be

opened due to muscle rigidity; therefore, 20 mg of diazepam^a was administered IV to gain muscle relaxation and relieve the anxiety. Ruminant decompression was therefore the first step in the treatment.

Next, we plugged the heifer's ears with cotton and covered the cow's head with a bed sheet to reduce the effects of environmental stimuli. The wound described earlier was debrided and infiltrated with tetanus anti-toxin to prevent further release of the tetanus toxin.

Procaine penicillin G was administered at a dose of 40,000 IU/Kg IM twice a day by the owner.

Fifty grams of Guaifensin^b was administered IV until muscle relaxation occurred.

Despite our intensive therapy, the heifer died two days after treatment was initiated. The owner did elect a necropsy to be performed after much urging from the attending veterinarian.

Necropsy Results

Upon necropsy, the absence of gross or histologic lesions plus a wound culture yielding *Clostridium tetani* confirmed the diagnosis.

Discussion

Cattle are generally the most resistant species to *Clostridium tetani*; however, if tetanus does develop in cattle, it is often fatal.

Diagnosis of tetanus in the cow is based largely on the clinical signs which mimic nervous system stimulation. Ruling out of other diseases, plus culture of the lesion at necropsy, also help to establish the diagnosis.

In cattle, tetanus is usually seen near parturition, after castration (especially using elastrator bands) or dehorning. The spores of *C. tetani* are common soil contaminants, especially in soils which have served as pastures for horses.

In an anaerobic environment, the spores are converted to toxin producing vegetative forms. The toxin then causes the signs associated with the disease.

Early diagnosis is essential to successful tetanus treatment, for delay will ultimately result in the affected animal's death.

a. Valium injectable: Roche Inc.

b. Summit Hill Laboratories