

Hindquarters Paralysis of a Pure Friesian Female Calf : A Case Report

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ABSTRACT

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A 25-days old pure Friesian female calf was admitted with flaccid paralysis of the hind limbs. Paralysis was extended to the bladder and anus sphincter muscle as it was concomitant with urinary and fecal incontinence. She was kept loose in a deserted backyard with a tethered donkey. Pin bricking using a sterile disposable needle along the lateral and median aspect of both limbs revealed intact deep (osseous) sensation while, superficial sensation was found lost. She was diagnosed as acute spinal cord injury due to trauma caudal to the 4th lumber vertebrae. Treatment protocol consisting of drugs and physiotherapy was applied immediately on the same day of admission. Full recover was achieved in 33 days PA.

Keywords : Female, Flaccid Paralysis, Spinal Cord Injury, Pin Bricking, Sudan.

I. INTRODUCTION

A 25-days old female Friesian calf was admitted to Atbara Vet. Hosp., River Nile State, Sudan on the 3rd of September 1995. She was suffering flaccid paralysis of the hind limbs . Paralysis extended to the bladder and anus sphincter muscle as it was concomitant with urinary and fecal incontinence. The tail was limp and powerless. The day before admission, she received a single 5ml intramuscular tetracycline injection by the owner immediately after he found her down. On admission the animal was in an excellent health condition with an eager suckling appetite. The owner reported that she and her mother were kept loose in a

deserted backyard with a tethered donkey before it came down with the paralysis.

II. Clinical Examination

- 2) Mucous membrane of the eyes, nostrils, mouth, vulva, and anus showed normal rosy color.
- 3) Body temperature was found normal (38 °C).
- 4) Both heart and respiratory rate were within the normal range.
- 5) Palpation of the skull, vertebral column, the ribs on both sides, fore and hind limbs bones revealed no fractures.

- 6) Hind limbs were flaccidly paralyzed (Figure 1), and when the animal was supported the stifles failed to extend due to paralysis of the quadriceps femoris muscle and the animal tends to collapse when left to bear weight. Hock and fetlock joints were also flexed, and digits of both limbs knuckled on the dorsum of the hoof if she urged to stand.
- 7) No muscular atrophy was noticed on the hindquarters.
- 8) The animal was carefully examined for external parasitic infestation but, no ticks or lice were found.
- 9) All signs of health were well prominent.

III. Neuromuscular examination

Superficial sensation:

Pin bricking was applied using a sterile disposable needle on the entire lateral and median aspect of the left and right limbs to examine the nerve reflex but, sensation was found lost on both limbs.

Deep or osseous sensation:

When deep insertion of the needle was applied on the lateral aspect of the pelvic limbs, a spontaneous reflex was elicited in both limbs.

Pin bricking on the sphincter ani revealed no sensation. The tail was limp and powerless.

Tapping on the patellar tendon revealed no extension response of the stifle due to paralysis of the quadriceps femoris muscle. Likewise, when testing the hock joint, reflex was lost due to paralysis of the gastrocnemius femoris muscle.

IV. Laboratory examination

Whole blood and fecal samples were taken and sent to the lab for the examination of blood and internal parasites and complete blood count (CBC), which revealed no parasitic infection. No abnormal

differential blood count was discerned as well, that excluded any underlying pathological condition.

V. Diagnosis

Based on the history, clinical, neurological and laboratory examinations the animal was diagnosed as suffering from hindquarters flaccid paralysis due to acute spinal cord injury caused by trauma caudal to the 4th lumbar vertebra probably inflicted by the donkey tethered in the same backyard where she was kept loose. Toxicity due Clostridium botulinum was excluded as her mother and the tethered donkey were sound besides, in botulism there is intact skin sensation, progressive nature of paralysis, protrusion of the tongue ^[1], which were all not applicable in the present case, in addition to the remarkable drinking appetite of the animal and its vivid and prominent health signs.

VI. Treatment

- 2) Immediate intravenous dexamethasone (as synthetic analogue of prednisolone) at a dose rate of 2 mg per kilogram twice daily for 5 days to prevent nerve demyelination and to promote peripheral nerve repair.
- 3) Oral three-pax milk (a multivitamin and mineral formula) at a dose rate of 10 ml twice daily for 10 days and 10 ml once per day for another 5 days as a nerve tonic and to keep the wellbeing of the animal.
- 4) Oral aspirin tablets (acetylsalicylic acid) 125 mg at a dose rate of 100 mg per kilogram twice daily for 5 days ^[2], to alleviate pain and as a thromboprophylaxis to prevent venous thromboembolic event following acute spinal cord injury due to interruption of neurologic impulses and the expected consequences of paralysis caused by metabolic changes to the blood vessels and altered venous competence such as decreased distensibility and increased flow resistance especially at the paralyzed extremities.

- 5) Daily massage and exercise of both limbs from the hip down to the digits was performed twice daily for 15 minutes to keep muscles, tendons, and joints healthy while the nerve is regenerating. Hip, stifle, hock, and fetlock joints were flexed and extended to their full normal limit daily during massaging to keep them fit.
- 6) Slings of the animal for 10, 20, 30, 40, and 50 minutes on days 1, 3, 5, 7 and 9 successively then, for 60 minutes on day 11 was applied till the animal regained its ability to bear weight on the affected limbs. On days 2, 4, 6, 8 and 10 slinging time of the animal was the same as that of the day before.
- 7) The animal was well bedded to avoid fractures just in case of sudden fall when getting better and to prevent decubital ulcers as well. Bedding was changed daily before cessation of urinary and fecal incontinence.
- 8) Pressure was exerted on the bladder on daily basis to assist the animal for full bladder evacuation to avoid urinary tract infections (UTI) and its inflammatory consequences.
- 9) Rectal temperature was daily taken to monitor (UTI) and fortunately it was always found normal during her stay.

7. Follow up:

- 1) On the 13th day post admission (PA) the tail started to become erected (Figure 2), and when tested by pin pricking a spontaneous movement reflex was elicited.
- 2) Fourteen days PA the sphincter ani regained its closure appearance with cessation of urinary and fecal incontinence.
- 3) On the 15th day PA, superficial sensation was regained on both limbs. When she was urged to stand 3 days later it took a long time to keep the standing position by its own strength after many times of falling.
- 4) On the 19th day PA, the animal needed a slight help to stand up but was able to take a few jerky steps before falling.

- 5) Twenty five days PA the animal was able to stand (Figure 3) and walk when urged to do so.
- 6) Twenty-six days PA, she was discharged upon an evaluation of being able to get up and take a few steps without falling. Seven days later, the animal was reported by her owner to achieve full recovery.

VII. Discussion

While paraplegia in cattle is infrequent, monoplegia was first reported in 1904 by Grunth, with loss of sensation on the median aspect of the tibia and recovery in 14 days [3]

Flaccid paralysis of the pelvic limbs is usually associated with a lesion of the L4 to S2 nerve roots, the lumbosacral plexus, or femoral, sciatic, peroneal (fibular), or tibial nerves [4]. In case of femoral paralysis, paralysis of the quadriceps muscles, which extend the stifle, and partial paralysis of the psoas major muscle, which flexes the hip, are seen [5]. Inability to extend the stifle to support weight on the pelvic limb is seen with L4 to L5 nerve root or femoral nerve disease. The patellar reflex is reduced or absent and sensation of the skin is reduced or absent on the medial surface of the limb as exactly observed in the present case. Trauma is the most common cause of acute paralysis [5]. Traumatic loss of nerve function may be due to neurapraxia, axonotmesis, axonostenosis, or neurotmesis. Neurapraxia is a temporary nerve conduction dysfunction that can last several weeks, but recovery is complete. Urinary and fecal incontinence often occur concomitant with paresis [6].

Due to lack of sophisticated neurologic techniques as magnetic resonance imaging (MRI), computerized tomography scanning (CT), electromyography (EMG), in the under developing countries the importance of the present case report lies in the fact that it can help saving lives of valuable food producing animals. Diagnosis in this report was solely based on a simple inexpensive technique to

delimit the affected region of the spinal cord depending on the part of body involved and the type of paralysis exhibited. A matter that enabled a diagnosis and building a plan of treatment depending on a favorable prognosis when deep or osseous sensation found intact indicating that spinal cord injury was acute and likely inflicted within <3 days prior to admission. The most important part is focusing on the case history combined with the symptoms observed and defining the system and region involved. Therefore, we are hopeful to extend this experience to our colleagues in the underdeveloped countries where judging of such cases of valuable animals and the instant response with an appropriate examination and treatment is crucial.

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IX. Conflicts of interest

The authors declare that there is no conflict of interest at individual or institutional levels in this case report.

X. Acknowledgment

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One more thing to mention is that this case report was first prepared immediately after the animal recovered and then kindly reviewed by Professor Babiker Abbas the head department of preventive medicine, Faculty of Veterinary Medicine, University of Khartoum but ,unfortunately the manuscript and copies of its attached photos were

lost for years. However, by chance photos and the case follow up documents showed up within old stuff and the case was re-written again for this publication

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Figure 1. Animal on the first day of admission showing flaccidly paralyzed hind limbs with knuckled digits.



Figure 2. Animal on the 13th day of admission, note the erected tail and the alertness of the animal.



Figure 3. The animal on the 25th day of admission in a standing position after complete course of treatment.