

Clinical Article

**EPIDUROGRAPHIC DIAGNOSIS OF LUMBAR SPINAL CORD
INJURY IN A LHASA APSO DOG AND ITS SUCCESSFUL
MANAGEMENT**

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Abstract: A three year old male Lhasa Apso dog weighing 8 kg was presented to the University Veterinary Hospital, kokkalai with the history of non weight bearing on both hind limbs and urinary incontinence since two days. Neurological deficits, indicated by absence of spinal reflexes in both hind limbs and incontinence of urine with distended urinary bladder were present. Haematological and serum biochemical parameters were within normal range. On epidurographic examination, spinal compression was diagnosed at L₃– L₄ and L₄ – L₅ intervertebral regions. The dog was treated with methyl prednisolone sodium succinate (MPSS) @ 30mg/kg IV and 10% polyethylene glycol (PEG) epidurally. The treatment was continued for the next ten days with oral prednisolone @ 1mg/ kg body weight in divided and tapering doses, Gabapentin @ 3mg/kg body weight and supportive therapy with neurotonics and proton-pump inhibitors. The dog regained the reflexes, recovered from urinary incontinence, started to bear weight on hind limbs in a week and had an uneventful recovery in ten days.

Keywords: Epidurography, MPSS, PEG.

Introduction

Compressive spinal cord diseases are common in canine patients, which may often lead to permanent and severe neurological deficits affecting motor, sensory and autonomic function of limbs. The most common causes for spinal cord compression in dogs include traumatic injuries, intervertebral disc (IVD) herniations, fibrocartilagenous embolism, spondylosis, lumbo-sacral malarticulations *etc* [2,6]. Traumatic lesions like vertebral column fractures and dislocations are most common in spinal cord transition zones in thoraco-lumbar and lumbo-sacral junctions, due to the relative instability compared to other region. Among the IVD affections in dogs 84 to 86% are thoraco- lumbar disc herniations [3]. Pathological conditions of lumbosacral and sacral spinal canal such as spinal malignancies, sacral cysts and spinal tumours are also not uncommon in dogs [4].

*Received June 29, 2017 * Published Aug 2, 2017 * www.ijset.net*

Myelography, though one of the least cost technique in diagnosing the spinal lesion, posses many limitations such as accidental puncturing the spinal cord, post procedural seizures, need for high expertise and obligatory general anaesthesia. Alternatively epidurography is easy to perform without general anaesthesia having minimal risk to the animal. But it has a limitation of non visualization of lesions in thoracic and cervical region due to restricted movement of contrast material to these regions. Other pitfalls of epidurography include injection into vertebral venous sinuses and spread of contrast medium into areas outside epidural space [4]. This case report describes the diagnosis of lumbar spinal cord injury by epidurography and its successful management in a Lhasa Apso dog.

Case history and observation

A three year old male Lhasa Apso dog weighing 8 kgs was presented to the University Veterinary Hospital, kokkalai with the history of non weight bearing on both hind limbs and urinary incontinence since two days. Previously animal had a weakness on left hind limb. All physiological parameters of the dog were within the normal range. On orthopaedic examination, no abnormalities could be detected in all four limbs. Observations on neurological examination are represented in Table.1. On abdominal palpation bladder was distended and hard. Severe spinal hyperpathy noticed at thoraco-lumbar and lumbar vertebral regions with flaccidity of both hind limbs.

Table.1: Neurological examination

Neurological examination	Observations/Responses
Gait	Paraplegic
Mental status	Alert
Posture	Sitting
While motion	Dragging on hind limbs
Wheel barrowing	Normal
Proprioception	Absent in both hind limbs
Pedal reflex	Absent in both hind limbs
Patellar reflex	Diminished in both hind limbs
Perianal reflex	Absent
Panniculus reflex	Absent in lumbar region
Tail wagging	Absent

Haematological parameters such as total leukocyte count, differential leukocyte count, haemoglobin concentration, erythrocyte sedimentation rate, packed cell volume, and platelet counts were within the normal range with a mild thrombocytopenia. Serum biochemical values such as C-reactive protein, Creatine phosphokinase, Alanine aminotransferase, Aspartate aminotranferase, Lactate dehydrogenase and Alkaline phosphatase also were within the normal limits.

On lateral survey radiograph of the posterior thoracic, lumbar and sacral vertebral column, intervertebral disc calcification was observed at L₃ – L₄, L₄ – L₅ and L₆ – L₇ regions. Dorsal intervertebral disc protrusion and spinal compression was suspected from thoraco-lumbar junction upto last lumbar intervertebral space (Fig 3). Uroliths were observed in bladder and urethra behind the *os penis*. Further, lumbo-sacral epidurography using iohexol @ 60mg/kg, the radiograph on lateral view showed dorsal lifting of ventral margin of contrast material at L₃ – L₄ and L₄ – L₅ regions suggestive of disc protrusion and spinal compressions (Fig 4).

Treatment and Discussion

The urinary bladder was catheterized and relieved of urine. The dog was treated with methylprednisolone sodium succinate (MPSS) @ 30mg/kg body weight as slow intravenous infusion, followed by epidural injection of 10% polyethylene glycol (PEG) @ 0.2ml/kg body weight on day of presentation. The treatment was continued for next ten days with oral prednisolone @ 1mg/ kg body weight in divided and tapering doses and gabapentin @ 3mg/kg body weight and supportive therapy with neurotonics and proton-pump inhibitors. Intravenous fluids and antibiotics were given for five days. On third day of oral therapy animal started bearing weight on hind limbs with moderate ataxia during walking. All neurological reflexes were improved and bladder function became normal. By sixth day of oral therapy, the dog was active and all physiological parameters were within normal range with improved appetite. After ten days of treatment animal had apparently improved except for mild ataxia (Fig. 2).

The regenerating ability of the spinal cord is very limited once it is injured, especially after the secondary injury has settled in through a complex biochemical processes [3]. Hence 'repair' is a more appropriate term to indicate the recovery process in that tissue. Lhasa Apso is one among the dog breeds prone to intervertebral disc disease [5]. Epidurography has been found diagnostic for identification of lumbosacral intervertebral disc herniations and spinal tumors in dogs [6 & 7]. MPSS therapy @ 30mg/kg body weight IV within eight hours of injury was opined to be only approved pharmacological therapy [1]. On neuronal damage,

PEG is reported to provide sealant effect on the damaged cell membranes, maintain neuronal conduction and prevent secondary damages [8]. The present case of spinal compression was successfully diagnosed with lumbosacral epidurography and satisfactory recovery achieved with intravenous MPSS and epidural PEG.

References

- [1] Bracken, M.B., 2012. Steroids for acute spinal cord injury. *The Cochrane Library*.
- [2] Feeney, D.A. and Wise, M., 1981. Epidurography in the normal dog: Technic and radiographic findings. *Veterinary Radiology & Ultrasound*, 22(1), pp.35-39.
- [3] Gage, E.D., 1975. Modifications in dorsolateral hemilaminectomy and disc fenestration in the dog [Intervertebral disc herniations]. *Journal American Animal Hospital Association*.
- [4] Feeney, D.A. and Wise, M., 1981. Epidurography in the normal dog: Technic and radiographic findings. *Veterinary Radiology & Ultrasound*, 22(1), pp.35-39.
- [5] Jeffery, N. 2008. New strategies for spinal cord repair. Proceedings of the European Society of Veterinary Orthopaedics and Traumatology 2008 - ESVOT, Munich, Germany.
- [6] Klide, A.M., Steinberg, S.A. and Pond, M.J., 1967. Epidura log rams in the Dog: the Uses and Advantages of the Diagnostic Procedure. *Veterinary Radiology & Ultrasound*, 8(1), pp. 39-43.
- [7] Ness, M. G. 2008. Degenerative lumbosacral stenosis in the dog: A review of 30 cases. *J. Small Anim. Pract.* 35: 185-190.
- [8] Olby, N., 2010. The pathogenesis and treatment of acute spinal cord injuries in dogs. *Veterinary Clinics of North America: Small Animal Practice*, 40(5), pp.791-807.



Fig 1: Day of presentation



Fig 2: On 10th day after treatment

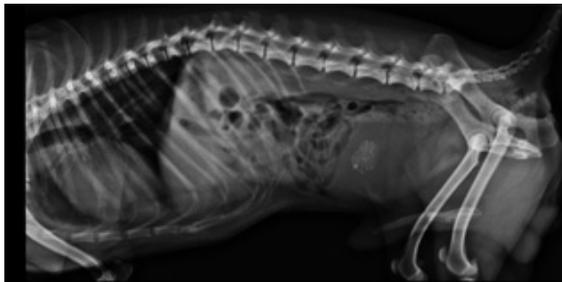


Fig 3: Survey radiograph (lateral view)



Fig 4: Epidurography (lateral view)