



SURGICAL MANAGEMENT OF CAUDA EQUINA SYNDROME IN A DOG USING INTERVERTEBRAL DISTRACTION SCREW FIXATION OF THE LUMBOSACRAL JOINT:-A CASE REPORT

Ioan Craciun¹, Lucian Fodor², Laura Lazar², Oana Mateiu-Petrec¹, Marius Pentea¹ and Eugenia Dumitrescu^{1*}

¹ University of Life Sciences "King Michael I" from Timisoara , Faculty of Veterinary Medicine

² „Happy Pet Clinic” Timisoara

e-mail: ioan.craciun@usvt.ro

Abstract: Degenerative lumbosacral stenosis in dogs frequently involves L7-S1 foraminal stenosis and L7 nerve root compression. Surgical techniques to decompress the L7 nerve root include foraminotomy and intervertebral distraction using a distraction screw fixation. This study aimed to assess the intervertebral fusion following the surgical distraction and stabilization using an intervertebral distraction screw in an intact female French Bulldog with cauda equina syndrome. Surgical treatment by dorsal laminectomy and discectomy results in decompression of neural structure at the level of cauda equina but when distraction-fixation is applied, the ultimate goal is vertebral fusion. In addition to surgical treatment, the patient received drug treatment for two weeks to manage the pain and inflammation and prevent microbial infections. The association of the surgical treatment with medication gave very good results. Distraction screw fixation using an intervertebral screw was well-accepted in this dog with severe degenerative lumbosacral stenosis, and the dog had a good clinical outcome with long-term follow-up.

• Introduction

Degenerative lumbosacral stenosis (DLSS) is a common disease not only in large breed dogs, but also in small breed dogs. This pathology is characterized by intervertebral disc degeneration, disc herniation, loss of disc height, proliferation of soft tissue and bone, and foraminal stenosis. Surgical management through dorsal laminectomy and partial discectomy can lead to clinical improvement in 66.7-96.5% of treated dogs, but propulsive forces are not restored after decompressive surgery.

Laminectomy and partial discectomy can cause further loss of disc height and stenosis of the intervertebral foramen (L7-S1), reducing the stability of the lumbosacral joint, thereby accelerating the development of the degenerative process. The increased instability and the continued mobility of the joint contribute to a greater risk for clinical complications related to the nerve roots.

• Material and method

The patient used in this study was an intact female French Bulldog, 13 kg. The study aimed to diagnose the site of lesion using MRI 0.22 T machine, followed by the surgical remove of the extruded disk fragment associated with implantation of intervertebral distraction screw. The MRI procedure was accomplished at the „Banat Veterinary Center” while the surgery was performed at the „Happy Pet Clinic” Timisoara, Romania.

The diagnosis of DLSS was established based on clinical signs and paraclinical investigations. The MRI exam (Fig. 1-2) was made with patient under general anaesthesia. The prognosis was guarded because the degree of neurological score was 5, meaning that the patient had no withdrawal reflexes on the hindlimbs and the deep pain perception was absent. As soon as the diagnosis has been established, the surgery was performed at the „Happy Pet Clinic” Timisoara. The surgery consisted of performing the dorsal laminectomy followed by the surgical remove of the protruded disk fragment and applying distraction screw fixation between the vertebral body of the last lumbar and first sacral vertebrae through dorsal approach.



Fig. 1. MRI T1 Transvers showing nerve compression

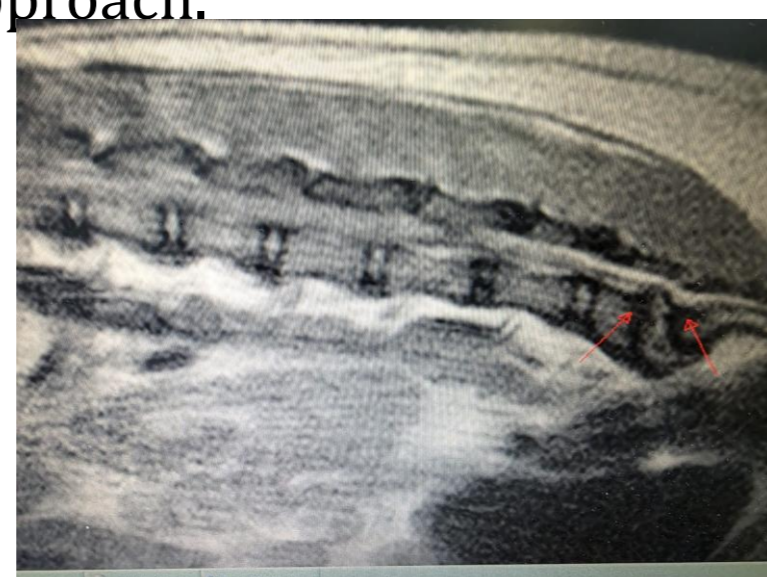


Fig. 2. MRI T2 Sagittal showing disc herniation

• Results and discussions

In this study we aimed to stabilize the joint and reduced neuropathic pain. Decompression of the LSJ by combining dorsal fixation using an IDS and widening the intervertebral foramen. A skin incision was made above the dorsal midline and along the spinous pro-cesses from L5 to S3, and a bipolar electrical surgical knife was used to separate soft tissue. The spinous processes of L6 to S3 were exposed. A 2 mm wide Kerison rongeur was used to perform an 8 X 20-mm dorsal laminectomy along the center of the dorsal aspect of the L7 and S1 vertebral bodies(Fig.3)

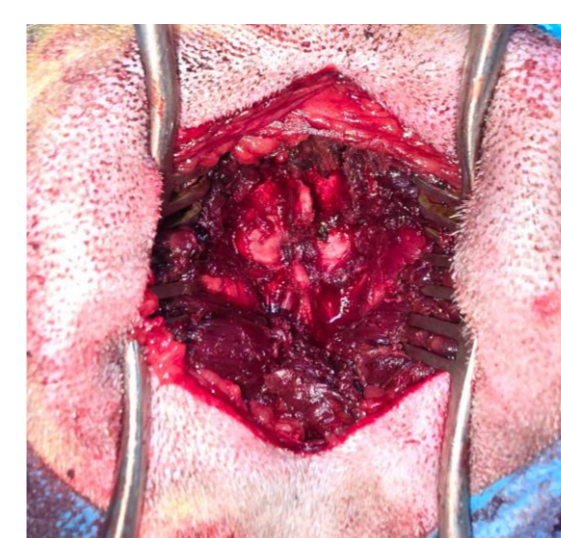


Fig. 3. Site of dorsal laminectomy of L7-S1



Fig. 4. Lateralization of the spinal cord to expose the protruded disc



Fig. 5. Latero-lateral digital radiograph, view of the lumbar, sacral and coccygeal segments of the spine immediately after screw implantation in the L7-S1 intervertebral disc.

From the site at which laminectomy was performed, a nerve hook was used to pull the spinal nerves of the cauda equina laterally, thus exposing the dorsal surface of annulus fibrosus of the L7-S1 intervertebral disk. A 4.0-mm-diameter trephine drill for bone collection was applied to the center of the exposed intervertebral disk to remove the dorsal and ventral aspect of the annulus fibrosus of the intervertebral disk creating a cylindrical screw hole.(Fig3, Fig.4)

The screw used has a hidden head with a length of 12 mm, and a diameter of 4.5 mm. A manual screw handle was used to insert the intervertebral distraction screw (IDS) into the vertebral canal until it could no longer be felt to be protruding and then, the head of the screw was covered by the spinal nerves of the cauda equina. In this way the lumbosacral joint is stabilized, the intervertebral foramen is widened and the recurrence of intervertebral disc herniation is prevented as is shown in literature. Proper IDS insertion was radiographically confirmed during and after surgery (Fig.5, Fig.6).

The haemorrhages were controlled by cauterization with bipolar electrocautery and the bleeding from vertebral canal was stopped using a haemostatic sponge. To prevent infections, the patient received systemic antimicrobial medication represented by ceftriaxone for 7 days after surgery, twice daily, intramuscularly and prednisone in association with gabapentine for pain management for two week's.



Fig. 6. Ventro-dorsal digital radiograph view of the lumbar, sacral and coccygeal segments of the spine immediately after screw implantation in the L7-S1 intervertebral disc

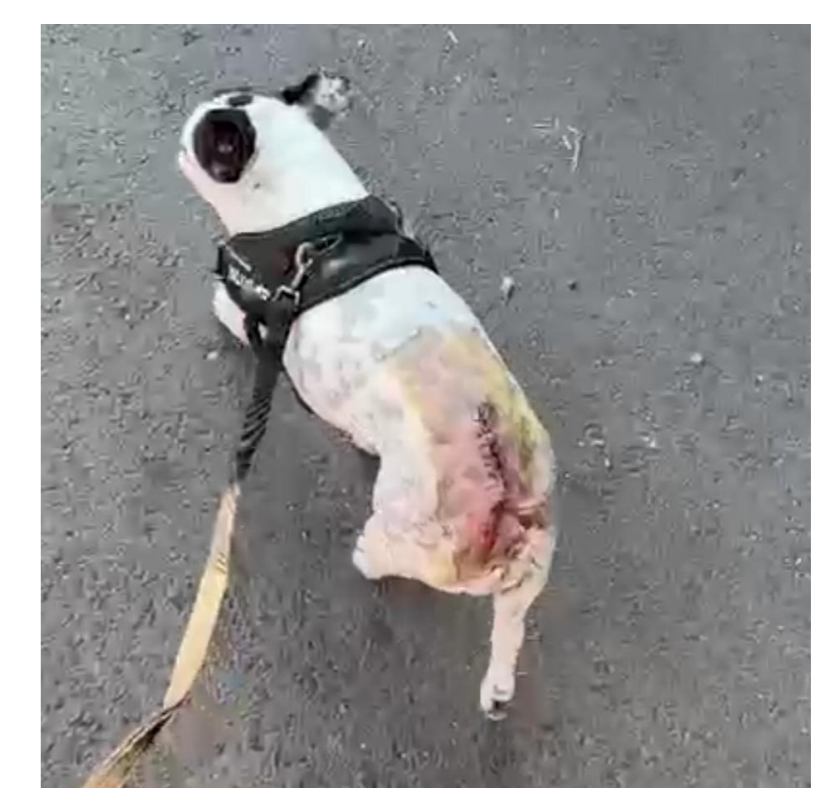


Fig. 7. The animal gait at 24 hours post surgery

• Conclusions

Decompressive laminectomy in association with implantation intervertebral distraction screw followed by antiinflammatory and control of neurological madicamentations is an effective treatment for DLSS.

• **Acknowledgement:** The study was carried out within the Happy Pet Clinic from Timisoara.