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CASE REPORT
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Extradural Synovial Cyst of the Cervical Spine in a Saint Bernard

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ABSTRACT

***Background*:** Extradural synovial cysts (ESC) originate from an extrusion of the synovium in unstable or degenerated joints. In the spine, this condition can cause neurological signs such as hyperesthesia, proprioceptive ataxia and paresis. Since extradural presentations of synovial cysts are unusual in dogs, the aim of this manuscript is to report a case of extradural synovial cyst of the cervical spine, as well as the clinical findings, diagnosis, surgical treatment and clinical evolution after therapy.

***Case*:** A 3-year-old spayed Saint Bernard weighing 60 kg was presented to a Veterinary Medical Teaching Hospital with a history of acute paraparesis that evolved to non-ambulatory tetraparesis five days after the appearance of the first clinical signs. Neurological examination revealed non-ambulatory tetraparesis, normal muscle tone and segmental spinal reflexes in the thoracic and pelvic limbs, as well as cervical pain associated with limited neck movement. According to the neurological examination, the likely lesion location was the C1-C5 spinal cord segment. The differential diagnosis list included intervertebral disc disease, caudal cervical spondylomyelopathy, neoplasm, infectious or noninfectious inflammatory disease, and cystic diseases. Complete blood (cell) count and serum biochemistry tests were within reference limits. The cerebrospinal fluid analysis revealed 35 mg/dL of protein (< 30 mg/dL) and 27 cells (up to 5 cells/mm^3) with a predominance of lymphocytes. In plain radiography, bone proliferations of the C4 (caudal) C5 (cranial) articular processes were observed and, in myelography, extradural spinal cord compression was evident between C4-C5 on the right side. The animal underwent dorsal laminectomy for spinal cord decompression. An extradural synovial cyst and proliferated articular processes were removed. At 1,281 days after surgery, the dog was clinically normal and presented no neurological deficits.

***Discussion*:** The etiology of synovial cysts has not been well established. However, it is believed that osteoarthritic degeneration associated with joint mobility could cause a rupture in the articular capsule, leading to a synovial membrane protrusion, which would fill with synovial fluid and compress spinal structures. ESC in the cervical region have been reported, often associated with cervical neoplasm. The case we report had no evidence of bone or intervertebral disc compression in myelographic and radiographic exams, abnormalities that would appear in cervical neoplasm. The patient underwent dorsal laminectomy to confirm the presumptive diagnosis and decompress the spine. In the histopathological exam, the cystic material consisted of connective fibrous tissue with a synovial cell lining layer, compatible with synovial cysts. The fluid drained during surgery was also analyzed, showing similarities to synovial fluid drained from other conventional joints. Cerebrospinal fluid analysis revealed mononuclear pleocytosis, a common finding in ESC. The ESC should be included in the differential diagnosis of dogs with cervical myelopathy, especially in young animals and large breeds. A myelographic exam is an important but not definitive auxiliary tool for diagnosis and the therapeutic plan. Dorsal laminectomy is an effective technique for treating ESC.

Keywords: cervical synovial cyst, dorsal laminectomy, cervical compression, articular facet, dog.

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INTRODUCTION

Cystic lesions of the spine and spinal cord are conditions that can cause neurological signs [3]. Among the cystic lesions, the extradural synovial cysts (ESC) that originate from an extrusion of the synovium in unstable or degenerate joints can be mentioned. They are found in synovial joints such as the coxofemoral, knee, elbow, and joints present in the spine [10]; the extradural presentation is unusual in dogs [5].

Synovial cysts have been described in the cervical, thoracolumbar and lumbosacral regions of the spinal cord [3,5,9,11]. The neurological signs usually observed in dogs with cervical ESC are hyperesthesia, proprioceptive ataxia, and tetraparesis, progressing from days to months [3].

Due to its unusual prevalence among other differentials and somewhat challenging diagnosis, the aim of this note was to report a case of extradural cervical synovial cyst, as well as the clinical findings, diagnosis, surgical treatment and patient clinical evolution after therapy.

CASE

A 3-year-old female Saint Bernard, spayed, weighing 60 kg, with a history of acute paraparesis that evolved to non-ambulatory tetraparesis 5 days after the appearance of the first clinical signs, was cared by the department of neurology and neurosurgery of a Veterinary Medical Teaching Hospital - UFSM.

Neurological examination revealed non-ambulatory tetraparesis (Figure 1A), normal muscle tone and spinal segmental reflexes of thoracic (flexor reflex) and pelvic (patellar and flexor reflex) limbs, cervical pain during palpation, and limitation of neck movement to the right side. Therefore, the likely location of the lesion was between C1-C5 segments of the spinal cord. Differential diagnosis included intervertebral disc disease, caudal cervical spondylomyelopathy (CCSM), neoplasm, infectious or noninfectious inflammatory disease, and cystic diseases of the spine.

Complementary exams included: complete blood count (HCT 40.7%, Ref: 37-55%; hemoglobin 13.3 g/dL, Ref: 12-18 g/dL; MCV 69.9 fL, Ref: 60-77 fL; MCHC 32.6%, Ref: 32-36%; WBC 3,500 µL, Ref: 6,000-17,000 µL; platelets 193,000 µL, Ref: 200,000 - 500,000 µL), serum biochemistry (creatinine 0.98 mg/dL, Ref: 0.5 - 1.5 mg/dL; urea 38.66 mg/dL, Ref: 21-59 mg/dL; ALT 21.2 UI/L, Ref: 21-102 UI/L; ALP 135 UI/L, Ref: 20-156 UI/L; total protein 6.4 g/dL, Ref: 5.4-7.1 g/dL; albumin 3.03 g/dL, Ref: 2.6-3.3 g/dL), urinalysis, abdominal ultrasound, and plain chest radiograph, presenting no abnormalities.

In the cerebrospinal fluid (CSF) analysis, collected via magna cistern, 35 mg/dL of protein (< 30 mg/dL) and 27 cells (up to 5 cells/mm^3), with a predominance of lymphocytes (75%) were observed. Plain radiograph of the cervical spine revealed bone proliferation adjacent to the articular processes of C4-C5 on the right side (Figure 1B). In the myelography, the ventrodorsal view identified a deviation and interruption of the contrast line between C4-C5, on the right side (Figure 1C). Based on the history, neurological examination and characteristics of the myelographic images, an extradural synovial cyst between the articular processes of C4 and C5 vertebrae was set as the presumptive diagnosis.

The patient underwent surgical treatment through C4-C5 dorsal laminectomy [6]. During surgery, extradural compression could be seen on the right side from a synovial cyst (Figure 1D), which was emptied and subsequently removed. The caudal articular process of C4 and the cranial articular process of C5, which were proliferated (Figure 1E), were also removed.

Postoperatively, methadone[1] [Mytedon® 0.3 mg/kg, every 6 h] was administered for the first 48 h, and was replaced by tramadol hydrochloride[2] [Tramal® 5 mg/kg, every 8 h] for an additional 48 h, in addition to meloxicam[3] [Elo-xicam 2%® 0.1 mg/kg, single application] within the first 24 h and dipyrone[4] [Febrax® 25 mg/kg, every 8 h] for 5 days. The dog was referred for physical therapy the day after surgery. After 96 h of the surgical procedure, the animal was discharged from hospital and was able to stand.

DISCUSSION

The ESC in the cervical region has been reported sporadically in the international literature, predominantly affecting large and giant breed dogs, whether or not associated with other malformations [3]. However, there is no description of this disease in the national literature, this being the first report published in Brazil.

The etiology of synovial cysts or ganglion cysts has not yet been fully elucidated. Osteoarthritic degeneration associated with joint mobility is believed to cause articular capsule rupture, synovial membrane

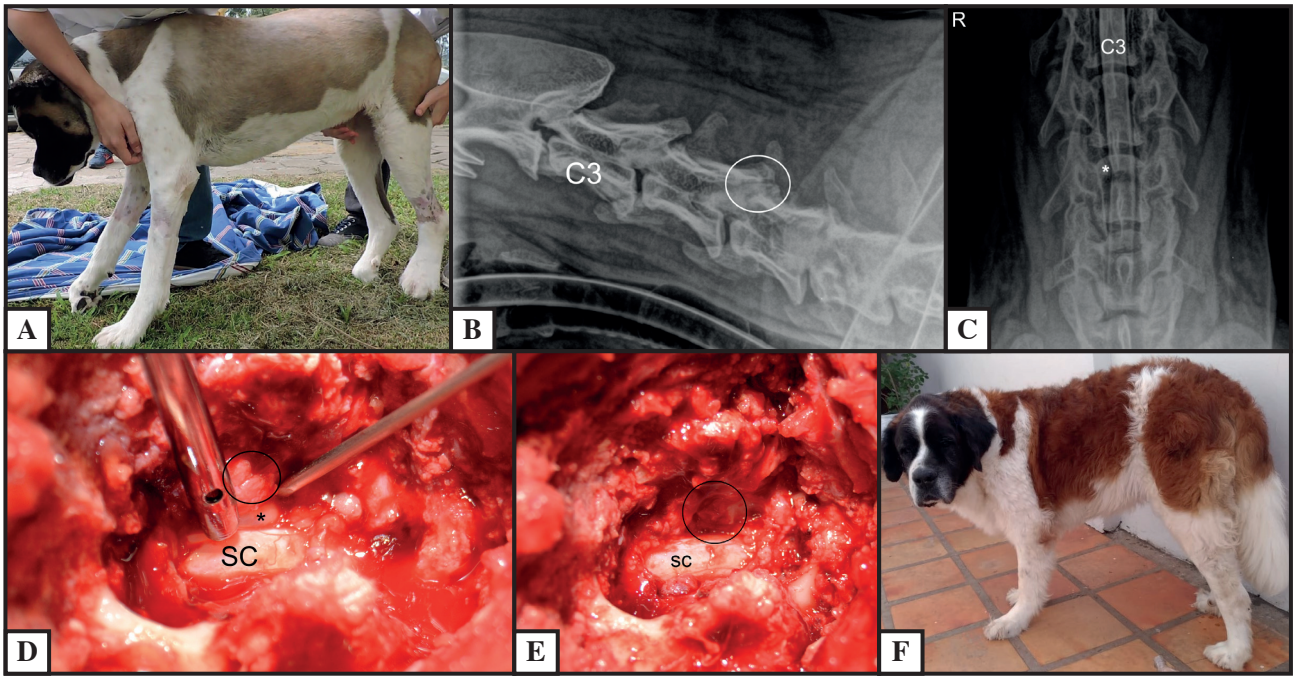

Figure 1. Extradural synovial cyst in a Saint Bernard dog. A- Non-ambulatory tetraparesis and proprioceptive deficits in the right thoracic and pelvic limbs. B- Plain radiograph view showing proliferation of the articular processes in C4-C5 (circle). C- Ventrodorsal myelography view, showing synovial cyst (white asterisk), causing extradural compression in C5, right side (R: Rigth). D- Dorsal view, during dorsal laminectomy, there is proliferation of articular processes (circle) and compression of the spinal cord (SC) by the synovial cyst (black asterisk). E- Spinal cord (SC) decompression after removal of articular processes and synovial cyst (circle). F- The dog shows no neurological deficits, 1,281 days after the surgical procedure.

protrusion, synovial fluid filling, and spinal cord extradural compression [8]. In human medicine, synovial cysts affecting the spine are rare, usually located in the lower back [12].

In dogs, ESC is often associated with CCSM. However, this association is poorly described. In this report, although the breed is predisposed to develop CCSM and the neurological signs are also compatible with this disease, there were no abnormalities in the myelography exam associated with intervertebral disc or bone compression [2]. Moreover, there was no recurrence of neurological signs since surgery, which would probably occur if the dog had CCSM [4].

In this report, the collected cystic material consisted of connective fibrous tissue with one or more layers of synovial cell lining, compatible with synovial cyst and not with ganglion cysts [3]. The drained fluid was analyzed and showed similar appearance to synovial fluid conventionally drained from other joints.

The presumptive diagnosis of extradural synovial cyst was initially made based on clinical history, neurological examination and myelographic findings. In this report, the dog presented extradural compression between C4-C5, similarly to dogs of other reports, which presented compressions in the cervical region [5]. The same authors mentioned degenerative changes and remodeling of articular facets at various points of the spine, a situation also found in this report, between C4-C5 (Figure 1B and 1D).

Magnetic resonance imaging is considered the best method for the diagnosis of synovial cysts. Findings on plain radiographs are not specific and only suggest joint degeneration between articular processes. The images observed on myelography are only suggestive of cystic disease, but are not a definitive diagnosis [3]. This exam was used in this dog due to the restriction of other diagnostic modalities, although allowing to reinforce the suspicion of the disease. The CSF analysis showed a mononuclear pleocytosis, which is a common finding [3].

The prevalence of extradural cervical synovial cysts in dogs is not yet well determined. The literature reports multiple occurrences in young giant breed dogs, associated or not with CCSM, but may have an isolated occurrence, when it affects middle-aged or elderly animals [3]. The patient in our report was young and of a large breed, and had an isolated extradural synovial cyst; different aspects from those presented in other reports. The low occurrence or diagnostic difficulty of synovial cysts in the spine, especially in the cervical region, may explain the lack of information regarding

the actual prevalence and epidemiological characteristics of this condition.

Cervical ESC treatment is surgical and its prognosis is favorable. If there is concomitant CCSM, decompression is usually performed in the same procedure [3]. Clinical treatments may be initially indicated. However, better results are found through surgery in both human and veterinary medicine [1,3,5,8].

Based on this information, the patient in our report underwent dorsal laminectomy, both for confirmation of presumptive diagnosis and for spinal decompression. Its recovery was considered satisfactory, as also reported by other authors [5,7,8,11]. After 1,281 days of the surgical procedure, the dog is clinically stable and presenting no neurological deficits (Figure 1F).

This report brings as clinical relevance to the cervical extradural synovial cyst as a differential diagnosis in dogs with cervical hyperesthesia and tetraparesis, being the myelographic exam an important but not definitive auxiliary tool in the diagnosis and therapeutic plan. Dorsal laminectomy is a technique indicated for spinal decompression caused by cervical extradural synovial cysts.

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