

# Cystic Abnormalities of the Spinal Cord and Vertebral Column



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## KEYWORDS

• Synovial cyst • Arachnoid diverticulum • Cysts • Dilated subarachnoid space

## KEY POINTS

- Cystic lesions of the vertebral column and spinal cord are an important differential diagnosis in dogs with signs of spinal cord disease.
- Synovial cysts are commonly associated with degenerative joint disease and commonly affect the cervical and lumbosacral regions.
- Arachnoid diverticulum (previously known as cysts) is common in the cervical region of large breed dogs and thoracolumbar region of small breed dogs.
- This article reviews the causes, diagnosis, and treatment of these and other, less common, cystic lesions.

## INTRODUCTION

Cystic lesions of the vertebral column and spinal cord are being recognized more commonly in veterinary patients concomitant with more frequent access to improved imaging such as MRI and computed tomographic (CT) myelography. These lesions may cause clinical signs, including paresis, ataxia, radiculopathy, and pain, whereas others may occur as incidental findings. Clinical assessment of a patient suspected of having a cystic spinal lesion includes physical and neurologic examination to localize the presence of a neurologic lesion. Imaging findings may then help to confirm the presence of a cystic lesion and the most likely differential diagnoses. Some cystic lesions may occur in conjunction with other congenital or acquired disease processes. The clinician must determine which is the most significant abnormality in such cases. With increased recognition of these conditions in veterinary patients, medical or surgical interventions can be tailored to the patient. This article describes the main cystic

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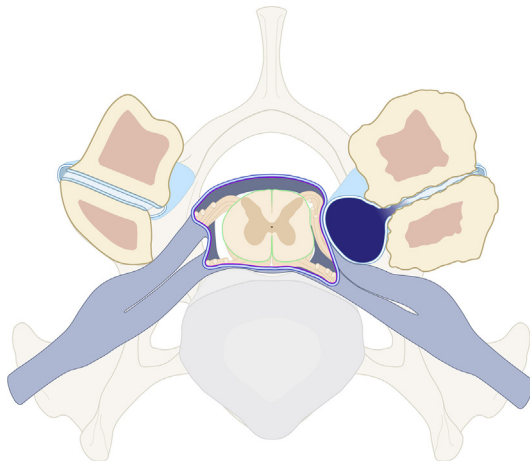
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lesions in the vertebral column and spinal cord in veterinary patients and reviews the current literature and controversies surrounding some of these diagnoses.

## EXTRADURAL SYNOVIAL CYSTS

### *Cause and Pathogenesis*

Extradural synovial and extradural intraspinal cysts arise from periarticular joint tissue. They can be divided into 2 cyst types: synovial and ganglion. Synovial cysts have a synovial lining containing fluid and ganglion cysts contain myxoid material with no specific lining. These are pathologic differences that may reflect different stages of the same disease.<sup>1</sup> Some investigators have suggested a synovial cyst may develop into a ganglion cyst or a ganglion cyst may develop a synovial lining over time.<sup>2</sup> Clinically, this distinction seems irrelevant, and, because both types of cysts occur in close proximity with the intervertebral joints, the term juxtafacet cysts has been coined to include both cysts.<sup>1-3</sup> The pathophysiology of development of these cysts is not well established. It is thought that degeneration of the zygapophyseal joint (osteoarthritic changes) and increased motion at the joint causes protrusion of the synovial membrane through defects of the joint capsule. Protrusion of the synovial membrane will cause the formation of a para-articular cavity filled with synovial fluid, which leads to extradural compression (**Fig. 1**).<sup>1,2</sup> Other proposed mechanisms are proliferation of pluripotent mesenchymal cells, myxoid degeneration with cyst formation in collagen tissue, and increased production of hyaluronic acid by fibroblasts.<sup>2</sup> Spinal instability or excessive mobility has been suggested as a cause, which is supported in that the 2 most common locations for synovial cyst formation are the lumbosacral region and the caudal cervical region, the latter of which is the area of greatest cervical mobility.<sup>1,4</sup> In humans, vertebral column instability is thought to play a factor in synovial cyst development because they occur with high frequency at the lumbar vertebra (L) 4 to L5 level, which is the most mobile region of the vertebral column, and because of their frequent association with osteoarthritis (40.5%), spondylolisthesis (43.3%), and disc degeneration (13.2%).<sup>5</sup> Synovial cysts in dogs are commonly associated with cervical spondylomyelopathy and the distribution of lesions mirrors the distribution of osseous compressions of the cervical spinal cord.<sup>1,2,6</sup> The precise



**Fig. 1.** A synovial cyst extending from degenerated articular facets (articular processes) in the cervical vertebral column. (Courtesy of The Ohio State University, Columbus, OH, 2016; with permission.)

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