



# What Is Your Neurologic Diagnosis?

A 1.5-year-old 9-kg (20-lb) spayed female Pug was evaluated because of a 6-month history of progressive tetraparesis. During physical examination, the dog was alert and had responsive mentation. Ambulatory tetraparesis with hypermetria of the thoracic limbs was evident. Conscious proprioception of the thoracic and

pelvic limbs was absent; there were skin abrasions on the dorsal surface of the feet of the thoracic limbs. No signs of pain were elicited on palpation of the cervical portion of the vertebral column. Thoracic and cardiac auscultation, abdominal palpation, lymph node palpation, and orthopedic examination revealed no abnormalities.

## Neurologic examination

### Observation

Mental	Alert	X	Depressed		Disoriented		Stupor		Coma	
Posture	Normal	X	Head tilt		Tremor		Falling			
Gait	Normal		Ataxia	X	Pelvic limbs		All 4	X	Circling	
Paresis	Pelvic limbs		Tetra	X	Hemi		Mono			
Other										

Key: 4 = exaggerated, clonus; 3 = exaggerated; 2 = normal; 1 = diminished; 0 = none; NE = not evaluated

### Postural reactions

	LF	RF	LR	RR
Wheelbarrow	1	1		
Hopping	1	1	1	1
Ext postural thrust			1	2
Proprioceptive pos	0	0	0	0
Hemistand/walk	NE	NE	NE	NE
Placing—tactile	1	1		
Placing—visual	2	2		

### Spinal reflexes

	LF	RF	LR	RR
Quadriceps			2	2
Extensor carpi	2	2		
Flexion	2	2	2	2
Crossed extensor	0	0	0	0
Perineal			2	2

### Cranial nerves

	L	R		L	R	Comments CN
II, VII—Vision menace	2	2	VIII—Nystagmus, resting	2	2	
II, III—Pupils resting	2	2	VIII—Nystagmus, change	2	2	
Stim L	2	2	V—Sensation	2	2	
Stim R	2	2	VII—Facial mm	2	2	
II—Fundus	2	2	V, VII—Palpebral flex	2	2	
III, IV, VI—Strabismus, resting	2	3	IX, X—Gag	2	2	
III, IV, VI, VIII—Strabismus, position	2	2	XII—Tongue	2	2	

### Sensation (Locate and describe abnormal)

Hyperesthesia	0	
Superficial pain	2	
Cutaneous reflex	2	
Deep pain	2	

**What is the problem? Where is the lesion? What are the most probable causes of this problem? What is your plan to establish a diagnosis? Please turn the page.**

## Assessment

### Anatomic diagnosis

Problem	Rule out location
Tetraparesis	Cranial cervical portion of the spinal cord or caudal fossa
Hypermetria	Cranial cervical portion of the spinal cord or caudal fossa

### Likely location of lesion

Cranial cervical portion of the spinal cord or caudal fossa

**Etiologic diagnosis**—Rule out disease processes included subarachnoid cyst, intracranial arachnoid cyst, intervertebral disk disease, Chiari-like malformation, inflammatory disease, infectious disease, and neoplasia.

The diagnostic plan included magnetic resonance imaging of the vertebral column (in particular the cervical portion) and brain (to detect any masses, lesions, or hemorrhagic process), CSF analysis (to identify an inflammatory, neoplastic, or infectious process; hemorrhage; and other biochemical or cellular abnormalities), clinicopathologic analyses (for purposes of screening prior to anesthesia and to detect biochemical abnormalities related to metabolic disease), and serologic testing (to rule out infection with *Neospora canis* and canine distemper virus).

**Diagnostic test findings**—Results of the CBC and serum biochemical analyses were within reference limits. Magnetic resonance imaging of the brain and cervical portion of the vertebral column was performed, and findings were consistent with a subarachnoid cyst located dorsally at the level of the C2-3 intervertebral space (Figure 1). A small syrinx was detected caudal to the cyst. No abnormalities of the cerebellum were identified via magnetic resonance imaging of the brain;

thus, lesions in this area were ruled out. A diagnosis of a subarachnoid cyst at the C2-3 intervertebral space with mild syringomyelia at the level of the C3 vertebra was made. Samples of CSF and serum were not submitted for further testing on the basis of the magnetic resonance imaging findings.

### Discussion

Spinal arachnoid cysts develop as a result of the accumulation of CSF, and are typically located on the dorsal aspect of the subarachnoid space.<sup>1</sup> The term cyst is somewhat misleading because these dilations often lack an epithelial lining; therefore, they are often referred to as leptomeningeal and meningeal cysts.<sup>1-3</sup> Neurologic deficits associated with subarachnoid cysts are attributable to spinal cord compression. The deficits can vary in severity but are usually slowly progressive and may or may not be associated with signs of pain.<sup>1,3</sup> Prognosis is dependent on the duration of spinal cord compression and severity of paresis and ataxia. Surgical resection of subarachnoid cysts carries a good prognosis for improvement of neurologic function.<sup>4</sup> A more favorable prognosis is likely with earlier intervention, although neurologic deficits can persist.<sup>4</sup>

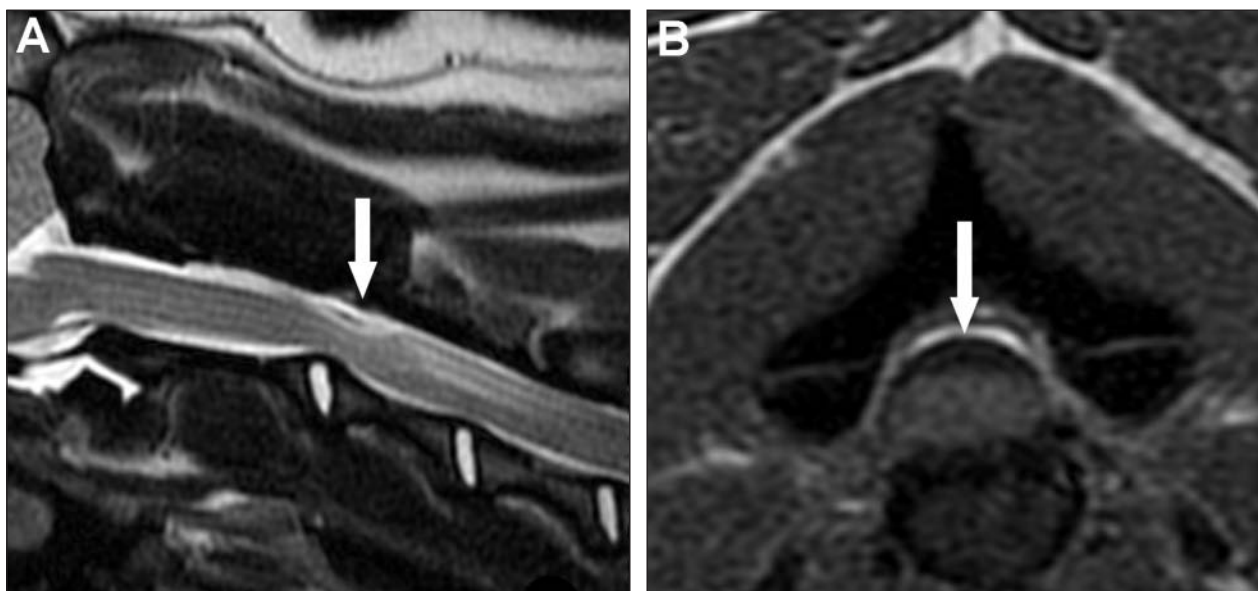


Figure 1—Magnetic resonance images of the cervical portion of the vertebral column and caudal portion of the brain of a 1.5-year-old Pug that was evaluated because of a 6-month history of progressive tetraparesis. A—A T2-weighted sagittal magnetic resonance image of the caudal portion of the brain and the C1 through C5 segments of the spinal cord. Notice the dorsal compression of the spinal cord by the cyst (arrow). There is also an area of hyperintense streaking just caudal to the cyst at the level of the C3-4 intervertebral space, which was identified as a mild syrinx. B—A T1-weighted axial magnetic resonance image of the cervical portion of the vertebral column at the level the C2-3 intervertebral space. The cyst (arrow) appears hypointense, compared with the spinal cord.

In the dog of this report, a C2-3 hemidorsal laminectomy with durectomy and cyst removal was performed. Histologic examination of the excised tissues revealed dense, fibrous connective tissue with scattered vessels, a cyst-like space, and loose, myxomatous to collagenous tissue with what appeared to be an epithelial lining. These findings were consistent with a spinal arachnoid or subarachnoid cyst.

Postoperative treatment consisted of IV administration of lactated Ringer's solution at a maintenance rate, analgesics (hydromorphone [0.5 mg, IV, q 4 h for 12 hours] and application of a transdermal fentanyl patch [25 µg/h] for up to 5 days after surgery), and cefazolin (200 mg, IV, q 8 h, which was discontinued after 24 hours). Treatment with omeprazole (5 mg, PO, q 24 h) was initiated the day after surgery.

The day after surgery, the dog was ambulatory with mild hypermetria in the right thoracic limb; conscious proprioception was absent in all 4 limbs. The dog was discharged from the hospital 3 days after surgery. At that time, the dog was ambulatory, and the hyperme-

tria had resolved. The fentanyl patch was removed 5 days after application, and administration of tramadol (12.5 mg, PO, q 8 to 12 h) was commenced. Follow-up examinations were performed at 3 and 6 weeks after surgery, and findings indicated complete resolution of the neurologic deficits.

## References

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3. Hashizume CT. Cervical spinal arachnoid cyst in a dog. *Can Vet J* 2000;41:225-227.
4. Rylander H, Lipsitz D, Berry WL, et al. Retrospective analysis of spinal arachnoid cysts in 14 dogs. *J Vet Intern Med* 2002;16:690-696.

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