

# SPINAL SUBARACHNOID HEMORRHAGE ATTRIBUTABLE TO SCHWANNOMA OF THE CAUDA EQUINA

Teoman Cordan, M.D.,\* Ahmet Bekar, M.D.,\* Osman Yaman, M.D.,\* and Şahsine Tolunay, M.D.†

Departments of \*Neurosurgery and †Pathology, Uludağ University, Görükle, Bursa, Turkey

Cordan T, Bekar A, Yaman O, Tolunay Ş. Spinal subarachnoid hemorrhage attributable to schwannoma of the cauda equina. *Surg Neurol* 1999;51:373-5.

## BACKGROUND

Cauda equina syndrome occurring as a result of spontaneous spinal subarachnoid hemorrhage (SAH) from a spinal tumor is reported to be rare.

## CASE DESCRIPTION

A 28-year-old woman presented at our clinic with a history of severe back pain for 10 days, progressive paraparesis, and urinary retention. Her physical examination revealed a mass located intradurally at the level of L1-L2 and a massive SAH. An L1-L2, laminectomy and a hemilaminectomy from D9 to D12 were performed and the SAH was evacuated and the cord was decompressed.

## CONCLUSION

At the first year follow-up, her restricted dorsal and plantar flexion continued. Post-gadolinium magnetic resonance imaging revealed no mass. © 1999 by Elsevier Science Inc.

## KEY WORDS

*Schwannoma, spinal tumor, subarachnoid hemorrhage.*

Spinal subarachnoid hemorrhage (SAH) is a rare event. Its occurrence is reported in the literature as 0.05–1.5% [2,3,7,8,14,17]. Spontaneous spinal SAH attributable to subarachnoid bleeding from a spinal tumor with acute compression of the adjoining nervous structures is exceptionally rare and only few cases have been reported [2,6,9]. In the reported cases there is a clear predominance of tumors located in the cauda equina [1,3,4,8]. From the histologic viewpoint, ependymomas are the most frequent type. Other neoplasms such as neurinomas, meningiomas, and gliomas are more uncommon [2–4,6,15,16].

Here we report a spinal tumor, which manifested

as acute cauda equina syndrome and was complicated by SAH. We discuss it in the light of the literature.

## CASE REPORT

A 28-year-old woman who had experienced severe lumbar back pain 10 days before admission complained of progressive weakness in her lower limbs. She had been unable to walk for the previous 2 days. Her physical examination was normal. Neurologic examination revealed paraparesis and severe distal pain; deep tendon reflexes were absent, with hypoesthesia up to D9. Deep sensorial examination was abnormal on the right. Urinary retention was present.

T1-weighted magnetic resonance (MR) images revealed dilatation of the spinal canal and a heterogeneous signal pattern between D7-L2. T2-weighted images revealed a mass at the levels of L1-L2 and an SAH at the upper levels (Figure 1). Post-gadolinium MRI revealed an enhancing mass at the levels of L1-L2. (Figure 1, A–D)

At operation L1–L2 laminectomy was performed. A 3 × 2-cm mass located at the cauda equina and adherent to a root was exposed. The mass was removed with CUSA. A dense hematoma was surrounding the mass. In addition, D9–D12 hemilaminectomy was performed to evacuate the hematoma and to decompress the cord. The dura was closed primarily.

Histopathological examination revealed a connective tissue tumor composed predominantly of compact spindle-shaped cells, arranged in short bundles or interlocking fascicles. This pattern was consistent with the Antoni A area of a typical schwannoma (Figure 2). Reticulin staining revealed an extensive network of reticulin at perivascular or

Address reprint requests to: Dr. Ahmet Bekar, Department of Neurosurgery, Uludağ University, School of Medicine, Görükle, Bursa, Turkey. Received December 4, 1996; accepted June 24, 1997.



**1** T2-weighted sagittal images revealed a mass at the levels of L1-2 and an SAH at the upper levels.



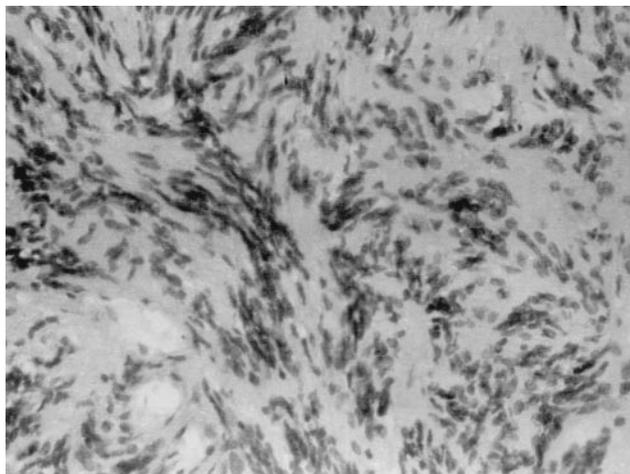
**3** Follow-up post gadolinium sagittal MRI revealed no mass 1 year later.

pericellular locations. The tumor stained diffusely positive for S-100, which is characteristic of schwannoma.

Postoperatively, she underwent rehabilitation. Fifteen days after the operation she was discharged with spontaneous voiding and mild paraparesis. One year later her restricted dorsal and plantar flexion on the right continued. She was also complaining of lumbar pain increasing with movement. Post-gadolinium MRI revealed no mass, except findings resembling arachnoiditis (Figure 3).

## DISCUSSION

The clinical syndrome of spinal subarachnoid hemorrhage was first described by Fincher in 1951. It is characterized by a sudden headache, acute sciatic



**2** Antoni A and B patterns characteristic of schwannoma are seen (H & E,  $\times 60$ ).

pain and xanthochromic cerebrospinal fluid, intermittent meningeal irritation, and sensorial deficit or paralysis of truncus or extremities [5]. Afterward, sphincter disturbance was added to these clinical findings [3,9,13].

The most frequent causes of spinal SAH include trauma (50% of cases), vascular malformations, and spinal tumors [2,4,8,9]. Less frequent causes include blood discrasias; systemic disorders such as lupus erythematosus, periarteritis nodosa, and leukemia; and spinal hamartomas, aneurysms, and toxic-infective states [2,12].

According to Kulali et al, massive spontaneous subarachnoid hemorrhage from a spinal tumor with acute compression of the adjoining nervous structures, followed by fecal and urinary incontinence was first described by Kraysenbühl. Both of the patients reported became paraplegic within minutes because of massive hemorrhage into the tumor and subarachnoid space, resulting in subarachnoid hematoma [9]. Our patient experienced severe back pain and progressive paraparesis 10 days before admission.

Subarachnoid bleeding with spinal tumors tends to occur at a relatively young age—mostly in the second, third, and fourth decades—as it did in our patient [2-4]. Also, subarachnoid hemorrhage tends to recur [2,7,8]. The clinical effect of the episodes is related to the amount of bleeding [15].

The subarachnoid hematoma that occurred in our patient caused acute cauda equina syndrome by compressing the cord. The most frequent symptoms in reported cases were intense pain in the lower back and radicular pain in the legs associated with meningeal symptoms, which suggested the spinal origin of the hemorrhage [2,3,8]. In our patient

the symptoms began with severe back pain, urinary retention and gait disturbance. Paresis developed rapidly [3,5,12]. Subarachnoid hemorrhage from a spinal tumor can be related to multiple factors. The most important one is the localization and the histologic characteristics of the tumor [2]. The high prevalence of tumors located in the region of the conus medullaris and cauda equina can be explained by mechanical and physical factors [2-4,7].

Indeed, tumors in this region are subjected to greater movements of traction along the spinal axis and their vascular attachments to the nerve roots can bleed into the subarachnoid space [3]. The tumor, especially in the case of schwannomas and neurofibromas, moves with flexion of the body and trunk [2,11]. Although we do not know exactly the situation in our case, in most of the reported cases the onset of symptoms occurred during effort or exercise [2,3].

From a histologic viewpoint, the high frequency of ependymomas of the filum terminale and conus medullaris is due to the fact that these tumors have a thin connective stroma containing numerous small blood vessels in a relatively superficial position [2,10].

Rapid growth of the tumor should also be considered as a possible cause of bleeding; changes occur in the vascularization of the tumor, which is more fragile and more susceptible to mechanical effects [2].

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## COMMENTARY

This is an interesting case report that highlights another source of subarachnoid hemorrhage, although rare. The clinician should keep in mind the presenting complaints and rapid progression for prompt diagnosis and immediate surgical intervention.

**Jose L. Salazar, M.D.**  
*Neurosurgeon*  
*Chicago, Illinois*