Spinal cord ependymoma presenting with neurological deficits in the setting of trauma

Amin F. Saad, MD, Larry T. Nickell, MD, S. Sam Finn, MD, and Michael J. Opatowsky, MD, MBA

Ependymomas represent 4% of all primary central nervous system neoplasms in adults, with 30% occurring in the spinal cord. We describe a young man with neurological deficits following a motor vehicle accident who was found to have an intramedullary cervicothoracic ependymoma.

CASE REPORT

A previously healthy 18-year-old man presented to the emergency department following a motor vehicle accident. All four extremities were weak immediately following the accident, with right-sided weakness noted on initial physical examination. Head and cervical spine computed tomography (CT) revealed no abnormalities. Cervical spine magnetic resonance imaging (MRI) revealed an expansile intramedullary mass at the cervicothoracic junction (*Figures 1a, 1b*) and mild interspinous ligament sprain. The patient's neurologic deficit resolved within 24 hours. The patient underwent laminectomy and laminoplasty with complete resection of the mass (*Figure 1c*) and had an uncomplicated postoperative course. Neurological examination immediately following surgery revealed decreased right lower extremity proprioception, 2+/5 strength at the right L2 to L3 levels, and 4/5 strength at the right L4 to S1 levels.

DISCUSSION

Ependymomas are the most common intramedullary neoplasm in adults and represent 60% of all intramedullary tumors. They arise from ependymal cells lining the central canal of the spinal cord. These tumors have a mean age of presentation of 38.8 years and a slight male predominance (57.4%) (1, 2). The clinical presentation of ependymoma is similar to that of other intramedullary lesions, with a prolonged history of slowly worsening myelopathic symptoms prior to diagnosis.

MRI evaluation is the imaging modality of choice in the patient with suspected cord neoplasm. Ependymomas are typically iso- to hypointense relative to the spinal cord on unenhanced T1-weighted images, with the vast majority exhibiting at least some degree of enhancement following intravenous gadolinium administration (1, 3, 4). T2-weighted images usually reveal a

hyperintense intramedullary lesion. Ependymomas may cause hematomyelia as well as subarachnoid hemorrhage, with 20% to 33% of lesions displaying a "cap sign" of signal hypointensity at the lesion margins secondary to hemosiderin deposition from intralesional chronic microhemorrhages. Cysts are often associated with ependymomas, with the majority representing nontumoral (polar) cysts at the margins of the lesion. True tumoral cysts (surrounded by enhancement) arise less frequently (1, 3, 4).

The preferred treatment for spinal cord ependymomas is complete surgical resection. Current advances in microsurgical technique and intraoperative monitoring enable frequent complete resection without worsening postoperative neurologic function (5). In a series of 31 cases described by Chang et al (5), only 10% of cases were associated with worsening neurological function, while 26% showed improvement and the rest remained stable. The preoperative neurologic status of the patient is the greatest predictor of postoperative functional outcome (2, 5). Radiation therapy delays disease progression in patients treated with subtotal resection.

1. Koeller KK, Rosenblum RS, Morrison AL. Neoplasms of the spinal cord and filum terminale: radiologic-pathologic correlation. *Radiographics* 2000;20(6):1721-1749.
2. Hanbali F, Fournay DR, Marmor E, Suki D, Rhines LD, Weinberg JS, McCutcheon IE, Suk I, Gokaslan ZL. Spinal cord ependymoma: radical surgical resection and outcome. *Neurosurgery* 2002;51(5):1162-1172.
3. Fine MJ, Kricheff II, Freed D, Epstein FJ. Spinal cord ependymomas: MR imaging features. *Radiology* 1995;197(3):655-658.
4. Kahan H, Sklar EM, Post MJ, Bruce JH. MR characteristics of histopathologic subtypes of spinal ependymoma. *AJNR Am J Neuroradiol* 1996;17(1):143-150.
5. Chang UK, Choe WJ, Chung SK, Chung CK, Kim HJ. Surgical outcome and prognostic factors of spinal intramedullary ependymomas in adults. *J Neurooncol* 2002;57(2):133-139.

From the Departments of Diagnostic Radiology (Saad, Nickell, Opatowsky) and Neurosurgery (Finn), Baylor University Medical Center at Dallas. **Corresponding author:** Amin F. Saad, MD, Department of Diagnostic Radiology, Baylor University Medical Center at Dallas, 3500 Gaston Avenue, Dallas, TX 75246 (e-mail: amin.saad@baylorhealth.edu).

Figure 1. MR images before and after resection. (a) Sagittal T2-weighted image reveals an expansile intramedullary mass (arrow) extending from the C7–T1 to the T2–T3 levels with rostral tumoral cyst formation (arrowhead). (b) Sagittal T1-weighted postgadolinium enhanced fat-saturated image demonstrates avid slightly heterogeneous enhancement of the mass (arrow). (c) Sagittal T1-weighted postgadolinium enhanced fat-saturated image following surgical resection reveals no evidence of residual enhancing tumor (arrow). A small amount of hemosiderin remains within the operative bed (arrowhead).

Avocations

CABG

The nurse flaunted full privilege of her license
And tasered light into my face
While sun was still stretching under the covers
And my mind flirted
With the daughter of the poppy
Dancing in my veins.

“It’s time for a walk,” she declared.
It was less than 12 hours since the bypass.
“It’s too early,” I muttered, shaking the cobwebs.
“Doctor’s orders.” And she started gathering
Host of wires and the tubes,
Annexed to my limbs and organs.

Propped up, I briefly stood
And promptly slumped to the floor.
The room turned a hybrid maze:
A Ferris wheel and a merry-go-round.
Tests revealed: machine and sponges had
Siphoned off half my blood.

And my intolerance of the opiate
Had my brain on a trampoline, but I felt no pain.
For two days I watched the room from the ceiling.
People came to shower wishes,
I have vague recollection.
If this is, they call high, I prefer the low.

—AMANULLAH KHAN, MD, PhD

Dr. Khan (e-mail: aman1963@gmail.com) is an oncologist on the medical staff of Baylor Medical Center at McKinney. In addition to publishing over 100 research articles, he is an award-winning poet who has written poems in three languages.