4. Conclusion

Patients with moyamoya disease who present with aneurysmal intracerebral hemorrhage should be treated to prevent rebleeding complications. Endovascular embolization using Onyx can be an effective treatment for aneurysms associated with moyamoya disease that would otherwise be difficult to treat surgically.

Conflicts of Interest/Disclosures

The authors declare that they have no financial or other conflicts of interest in relation to this research and its publication.

References

[1] Amin-Hanjani S, Goodin S, Charbel FT, et al. Resolution of bilateral moyamoya associated collateral vessel aneurysms: rationale for endovascular versus surgical intervention. Surg Neurol Int 2014;5:S155–60.
[2] Arai Y, Matsuda K, Isozaki M, et al. Ruptured intracranial aneurysms associated with moyamoya disease: three case reports. Neurol Med Chir (Tokyo) 2011;51:774–6.
[3] Borota L, Marinkovic S, Bajic R, et al. Intracranial aneurysms associated with moyamoya disease. Neurol Med Chir (Tokyo) 1996;36:860–4.
[4] Chalouhi N, Tjoumakaris S, Gonzalez LF, et al. Onyx embolization of a ruptured lenticulostriate artery aneurysm in a patient with moyamoya disease. World Neurosurg 2013;80:436.
[5] Honda M, Tsutsumi K, Yokoyama H, et al. Aneurysms of the posterior cerebral artery: retrospective review of surgical treatment. Neurol Med Chir (Tokyo) 2004;44:164–8 [discussion 169].
[6] Ikezaki K, Fukui M, Inamura T, et al. The current status of the treatment for hemorrhagic type moyamoya disease based on a 1995 nationwide survey in Japan. Clin Neurol Neurosurg 1997;99:S183–6.
[7] Kawaguchi S, Sakaki T, Morimoto T, et al. Characteristics of intracranial aneurysms associated with moyamoya disease. A review of 111 cases. Acta Neurochir (Wien) 1996;138:1287–94.
[8] Kim SH, Kwon OK, Jung CK, et al. Endovascular treatment of ruptured aneurysms or pseudoaneurysms on the collateral vessels in patients with moyamoya disease. Neurosurgery 2009;65:1000–4 [discussion 1004].
[9] Nishio A, Hara M, Otsuka Y, et al. Endovascular treatment of posterior cerebral aneurysm associated with moyamoya disease. J Neuroradiol 2004;31:60–2.
[10] Seki Y, Fujita M, Mizutani N, et al. Spontaneous middle cerebral artery occlusion leading to moyamoya phenomenon and aneurysm formation on collateral arteries. Surg Neurol 2001;55:58–62 [discussion 62].
[11] Yoshida Y, Yoshimoto T, Shirane R, et al. Clinical course, surgical management, and long-term outcome of moyamoya patients with rebleeding after an episode of intracerebral hemorrhage: an extensive follow-Up study. Stroke 1999;30:2272–6.
[12] Yu JL, Wang HL, Xu K, et al. Endovascular treatment of intracranial aneurysms associated with moyamoya disease or moyamoya syndrome. Interv Neuroradiol 2010;16:240–8.

http://dx.doi.org/10.1016/j.jocn.2015.05.016

Malignant peripheral nerve sheath tumor arising in the setting of cervical nerve root schwannomas

Nolan Winslow [b], Kingsley Abode-Iyamah [a,*], Patricia Kirby [c], Mark Smith [d], Chandan Reddy [a]

[a] Department of Neurosurgery, University of Iowa Hospitals and Clinics, 1426 Ranier Drive, Iowa City, IA 52246, USA
[b] University of Iowa, Carver College of Medicine, Iowa City, IA, USA
[c] Department of Pathology, University of Iowa Hospitals and Clinics, Iowa City, IA, USA
[d] Department of Radiation Oncology, University of Iowa Hospitals and Clinics, Iowa City, IA, USA

ARTICLE INFO

Article history:
Received 12 May 2015
Accepted 22 May 2015

Keywords:
Malignant nerve sheath tumor
Nerve sheath tumor
Schwannoma

ABSTRACT

We present a 23-year-old woman who was diagnosed with a malignant peripheral nerve sheath tumor (MPNST), 17 months following the resection of a schwannoma. MPNST is rare and is usually associated with neurofibromatosis. The typical treatment of resection and radiation is difficult to achieve in the spine.

1. Introduction

Malignant peripheral nerve sheath tumors (MPNST) are commonly associated with neurofibromatosis 1 (NF-1), seen in up to 5% of patients [1,2]. MPNST is extremely rare in the general population with an incidence of 0.001% [1,2]. Almost exclusively, neurofibroma acts as the source of malignant transformation in NF-1. Transformation of schwannomas into MPNST is exceedingly rare [1,3]. We present a transformation of a schwannoma to a low grade MPNST.

2. Case report

A 23-year-old woman, with no significant past medical history, presented with 4–6 months of intermittent neck pain and numbness. She denied that she had weakness or bowel or bladder dysfunction. On examination, she had 4/5 strength on right and left dorsiflexion and plantarflexion, as well as decreased sensation below T1–T2 on the left and T5–T6 on the right. She had 4+ patellar reflexes bilaterally with positive clonus. The remainder of her neurologic examination was unremarkable. An MRI showed a spinal cord lesion at the level of C7–T1, suspicious for schwannoma (Fig. 1). She underwent a C7–T1 laminectomy and gross total resection, with care taken to preserve the right C8 nerve root. The histology at this time established the diagnosis of schwannoma (Fig. 2).

Due to financial constraints, the patient missed her planned follow-up and returned approximately 17 months later to the emergency department with acute upper back pain radiating to her right upper extremity and involving the posterior neck accompanied by decreased sensation of the right upper extremity. On examination, she had 4/5 strength in her bilateral upper extremities, 3+ patellar reflexes, and gait instability. An MRI of the cervical spine showed recurrence at the C7–T1 level with significant cord

* Corresponding author. Tel.: +1 7734109575.
E-mail address: kingsley-abode-iyamah@uiowa.edu (K. Abode-Iyamah).

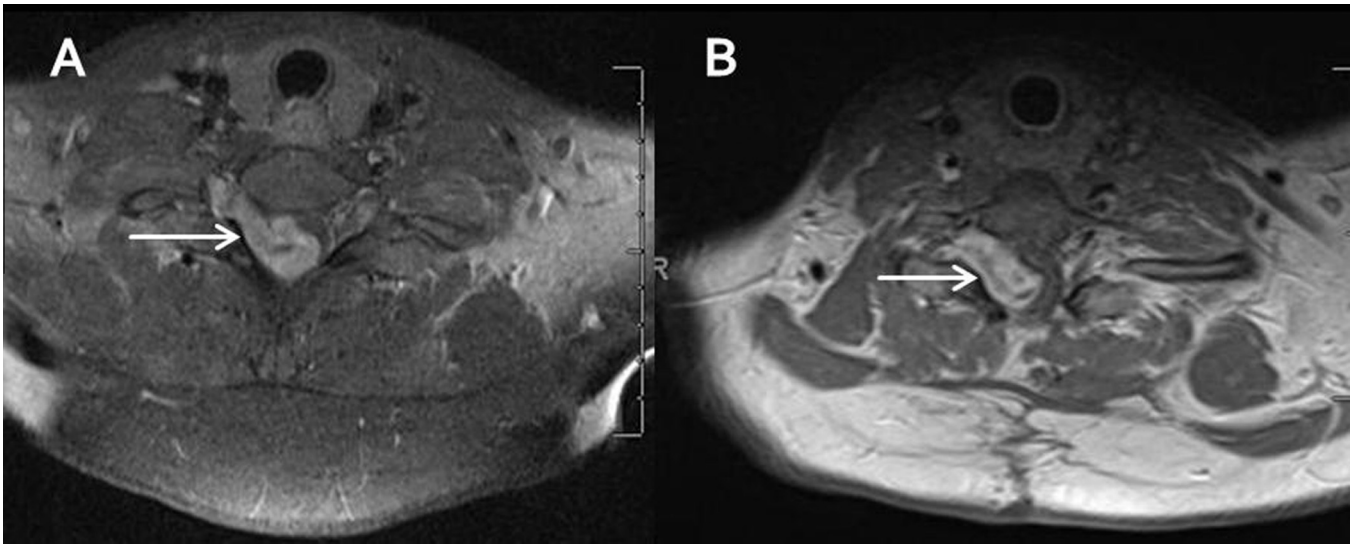

Fig. 1. (A) Axial T1-weighted postcontrast MRI (July 2012) showing an extramedullary intradural mass at C7–T1 (arrow) extending through the neural foramina. (B) Axial T1-weighted postcontrast MRI (February 2014) showing the recurrent heterogeneously enhancing extramedullary intradural lesion expanding through the C7–T1 neural foramen.

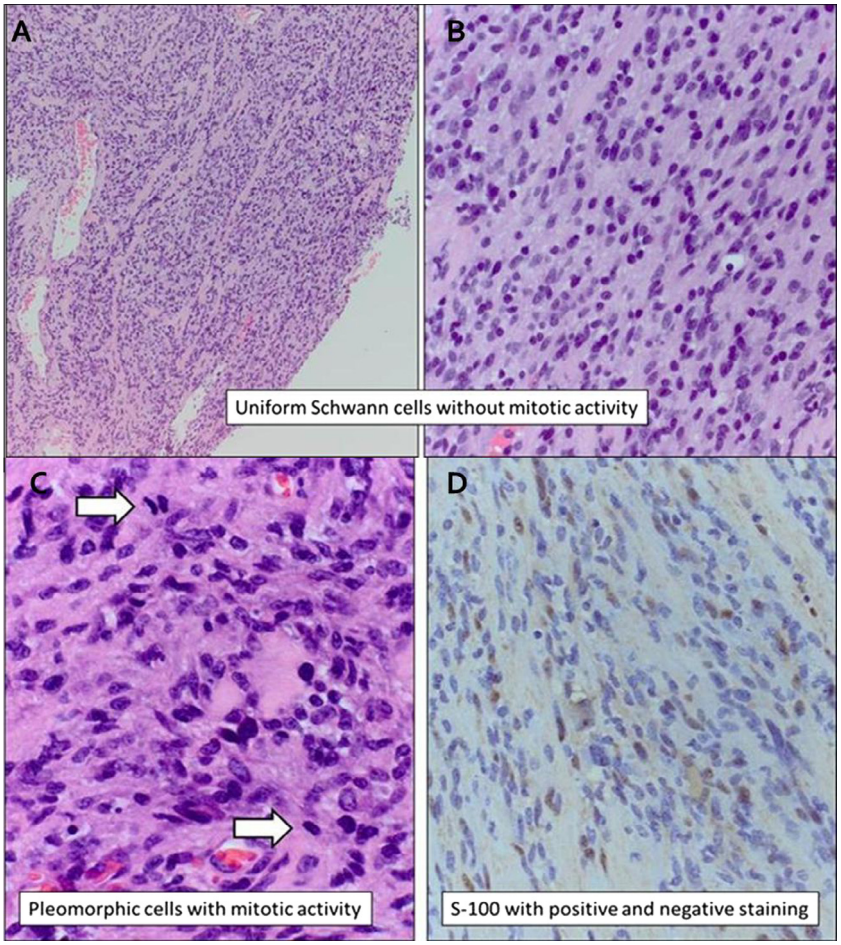

Fig. 2. First resection: (A) Schwann cell proliferation seen at low power magnification (hematoxylin and eosin [H&E]; 10 × magnification); (B) high power magnification (H&E; 20 × magnification). Second resection: (C) Low grade malignant peripheral nerve sheath tumor showing mitotic activity and pleomorphic cells (arrow; H&E; 40 × magnification); (D) S-100 positivity is variably lost (20 × magnification). This figure is available in colour at www.sciencedirect.com.