Supratentorial extra parenchymal schwannoma mimicking meningioma: a case report

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Ade Ricky Harahap^{1*}, Devy Serevina²

ABSTRACT

Introduction: Schwannomas account for approximately 8% of primary intracranial tumors and constitute almost 90% of tumors in the cerebellopontine angle, which is always associated with the eighth cranial nerve. Intraparenchymal schwannomas are sporadic, and only 64 cases have been reported to date in the literature, among which the first case was described by Gibson *et al.* in 1966.

Case presentation: A 30-year-old female had been subject to headaches and intermittent seizures for two years. On clinical examination, no neurological deficit was found. A brain CT scan revealed an isodense lesion in the right frontal lobe with homogenous enhancement after contrast injection. During surgery, a well defined mildly vascular, grayish with measuring 7 x 5 cm was found. The tumor was completely intraaxial with a well-demarcated margin. The total removal of the tumor was done. Histopathological study indicates a tumor encapsulated in thin

connective tissue, composed entirely of neoplastic Schwann cells and forming two basic patterns. The hypocellular parts (Antoni B pattern) and hypercellular parts composed of an elongated cell with occasional nuclear palisading (Antoni A pattern) with slight nuclear polymorphism.

Conclusion: The clinical manifestation of intracerebral parenchymal schwannoma depends mainly on the locations and the sizes of the tumors. The histogenesis of intracranial schwannomas not arising from cranial nerves is still unclear as Schwann cells are generally not present in the cerebral parenchyma. Microscopically, analysis of the tissue has shown areas of nuclear palisading, characteristic of schwannoma, and dense, cellular tumor, alternating with the loosely textured myxoid tumor is present in equal portions, consistent with Antoni type A and Antoni type B tissue.

Keywords: extra parenchymal, histogenesis, meningioma, mimicking, schwannoma

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¹Department of Neurosurgery, Batam Authority Hospital, Indonesia.

²Department of Pathology, Batam Authority Hospital, Indonesia.

*Corresponding author:
Ade Ricky Harahap; Department
of Neurosurgery, Batam Authority
Hospital, Indonesia;
adericky84@gmail.com

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Introduction

Schwannomas account for approximately 8% of primary intracranial tumors and constitute almost 90% of tumors in the cerebellopontine angle, which is always associated with the eighth cranial nerve.¹ Intraparenchymal schwannomas are sporadic, and only 64 cases have been reported to date in the literature,² among which the first case was described by Gibson *et al.* in 1966.² Although most of the intraparenchymal schwannomas are benign, 7 cases of malignant intracerebral or intramedullary schwannomas have been reported previously.³

Case presentation

A 30 years old female had been subject to headache and intermittent seizures for two years, on clinical examination the neurological examination was GCS 15 with no neurological deficit was found, pupil equal with size 3 mm/ 3 mm, light reflex normal. The strenght of extremities were normal. Diplopia was not found. A brain CT scan revealed a hyperdense lesion in the right frontal lobe with

homogenous enhancement after contrast injection (**Figure 1**).

During surgery, the right frontotemporal incision scalp was opened, Craniotomy of the skull. Dura mater was tight with tumor identification, a well defined mildly vascular, grayish with measuring 7 x 5 cm was found. The tumor was completely intraaxial with a well-demarcated margin. The total removal of the tumor was done (**Figure 2**).

Histopathological study indicates a tumor encapsulated in thin connective tissue, composed entirely of neoplastic Schwann cells and forming two basic patterns. The hypocellular parts (Antoni B pattern) and hypercellular parts composed of an elongated cell with occasional nuclear palisading (Antoni A pattern) with slight nuclear polymorphism (**Figure 3**).

Discussion

Intracranial schwannomas not related to cranial nerves are very rare and represent less than 1%. As reported elsewhere, approximately 70 cases have been reported so far.⁴ Unlike vestibular schwannomas,

Figure 1. A: Axial; B: Coronal; and C: Sagittal head CT scan showed a hyperdense lesion on the right frontal lobe.

Figure 2. A: right frontotemporal incision; B: tumor identification, a well defined mildly vascular, grayish with measuring 7 x 5 cm was found; C: The tumor was completely intraaxial with a well-demarcated margin. Total removal of the tumor was done

Figure 3. The hypocellular parts (Antoni B pattern) and hypercellular parts composed of an elongated cell with occasional nuclear palisading (Antoni A pattern) with slight nuclear polymorphism

the intraparenchymal schwannomas are slightly more common in males, though some authors such as Sharma *et al.* have reported a significant male to female ratio (M:F = 3:1). Furthermore, the majority of cases have been reported in children and young adults, with the average age being less than 21 years. Vestibular schwannomas, however, are more common in the 5th decade unless associated with neurofibromatosis. Some commonly reported radiographic characteristics of intraparenchymal schwannoma are intratumoral calcification (25%), cyst formation (60%), mild to moderate peritumoral edema (50%), and varying degree of gadolinium enhancement of the solid tumor component.^{4,5}

The clinical manifestation of intracerebral parenchymal schwannoma depends mainly on the locations and the sizes of the tumors. In our case, radiologically, it was not possible to differentiate schwannoma from meningioma. Microscopically, tissue analysis reveals areas of nuclear palisading, characteristic of schwannoma, and dense, cellular tumor alternating with the loosely textured myxoid tumor is present in equal portions, consistent with Antoni type A and Antoni type B tissue.⁶ This appearance may be mimicked by meningioma.^{7,8} Also, schwannomas occasionally have a conspicuously whorled pattern resembling meningioma.⁶

The histogenesis of intracranial schwannomas not arising from cranial nerves is still unclear as Schwann cells are generally not present in the cerebral parenchyma. Many theories have been proposed to explain the possible mechanism underlying the histogenesis and origin of these rare tumors. There are two common theories. One suggests a developmental origin according to which aberrant Schwann cells in the brain parenchyma may occur due to the transformation of the pial mesenchymal cells or from displaced neural crest cells that form the foci of Schwann cells.⁸

Conclusion

In summary, based on clinical presentation and radiological appearances, schwannoma in unusual sites can easily be mistaken for meningiomas. Light microscopy may also reveal similar findings. Immunohistochemical techniques with a battery of antibodies offer a higher diagnostic specificity.

Author contribution

Authors' contributions include manuscript preparation, literature search, manuscript editing, and final manuscript.

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Conflict of interest

There is no conflict of interest.

References

1. Rubinstein LJ. Tumors of the nerve-roots and peripheral nerves. In: Russell DS, Rubinstein LJ (eds.) *Pathology of tumors of the nervous system*. 4th ed. London: Arnold; 1977. p. 372-379.
2. Gibson AA, Hendrick EB, Conen PE. Case reports. Intracerebral schwannoma: Report of a case. *J Neurosurg*. 1966; 24(2): 552 – 557. DOI: [10.3171/jns.1966.24.2.0552](https://doi.org/10.3171/jns.1966.24.2.0552).
3. Sharma S, Abbott RI, Zagzag D. Malignant intracerebral nerve sheath tumor: A case report and review of the

- literature. *Cancer*. 1998; 82(3): 545 – 552.
4. Zagardo MT, Castellani RJ, Rees JH, Rothman MI, Zoarski GH. Radiologic and pathologic findings of intracerebral schwannoma. *AJNR Am J Neuroradiol*. 1998; 19(7): 1290 – 3.
 5. Sharma MC, Karak AK, Gaikwad SB, Mahapatra AK, Mehta VS, Sudha K. Intracranial intraparenchymal schwannomas: A series of eight cases. *J Neurol Neurosurg Psychiatry*. 1996; 60(2): 200 – 3. DOI: [10.1136/jnnp.60.2.200](https://doi.org/10.1136/jnnp.60.2.200).
 6. Lee S, Park SH, Chung CK. Supratentorial intracerebral schwannoma: Its fate and proper management. *J Korean Neurosurg Soc*. 2013; 54(4): 340 – 3. DOI: [10.3340/jkns.2013.54.4.340](https://doi.org/10.3340/jkns.2013.54.4.340).
 7. Perentes E, Rubinstein LJ. Immunohistochemical recognition of human nerve sheath tumours by anti-Leu 7 (HNK-1) monoclonal antibody. *Acta Neuropathol*. 1985; 68(4): 319 – 24. DOI: [10.1007/bf00690835](https://doi.org/10.1007/bf00690835).
 8. Ma L, Yang SX, Wang YR. Intracerebral schwannoma mimicking parasagittal meningioma. *J Craniofac Surg*. 2013; 24: 541 – 3.

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