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Tentorium Schwannoma Mimicking Meningioma: An Unusual Location

Meningiomu Taklit Eden Tentoryum Schwannomu: Nadir Bir Yerleşim

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ABSTRACT

A 60-year-old female was admitted to our clinic complaining of a long-lasting headache. Cranial magnetic resonance imagining examination of the patient revealed a 22x24 mm extra-axial, well-demarcated, mass lesion based on the left tentorium. The patient underwent a craniotomy and the tumor was totally excised with the adjacent tentorium. The histopathological examination of the tumor complied with the diagnosis of schwannoma. The rest of the clinical course was uneventful and the patient was released from the hospital without any neurological deficit. Intracranial schwannomas can rarely originate from atypical dural locations and radiological techniques are not always helpful in distinguishing tentorial schwannoma from tentorial meningioma. We presented a patient with a tentorium schwannoma mimicking meningioma and discussed the current literature.

KEY WORDS: Meningioma, Schwannoma, Tentorium

ÖZ

60 yaşında bayan hasta kliniğimize uzun zamandır devam eden başağrısı şikayeti ile başvurdu. Kraniyal manyetik rezonans incelemesinde solda tentoryum üzerinde keskin sınırlı 22x24 mm boyutlarında ekstra-aksiyel kitle tespit edildi. Kraniyotomi ile kitle yapışık olduğu tentoryum ile birlikte total olarak çıkarıldı. Histopatolojik inceleme sonucu schwannom olarak bulundu. Schwannomlar nadiren atipik dural yerleşimli olarak izlenebilirler ve radyolojik tetkikler tentoryum schwannomlarını meningiomlardan ayırd etmede her zaman yardımcı olamamaktadır. Biz bu makalede, tentoryum meningiomunu taklid eden schwannom nedeniyle opere ettiğimiz bir hastamızı sunduk ve literatür bilgileri eşliğinde bu tanının histopatolojik ve radyolojik özelliklerini tartıştık.

ANAHTAR SÖZCÜKLER: Meningiom, Schwannom, Tentoryum

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INTRODUCTION

Schwannomas comprise approximately 8% of all intracranial tumors and mostly arise from the eighth cranial nerve (15). Other common sites that schwannomas can originate from are the trigeminal, vagus, glossopharyngeal and trochlear nerves. However, a schwannoma originating from the tentorium is an extremely rare situation (1-3,5,8,9). We report a case with an unusual location of an intracranial schwannoma.

CASE REPORT

A 60-year-old female was admitted to our clinic complaining of a long-lasting headache. Her neurological examination was normal and she had no history of any systemic disease or trauma. Her blood biochemistry was also within the normal limits. Her cranial magnetic resonance imaging (MRI) examination revealed a 22x24 mm extra-axial, well-demarcated, mass lesion based on left tentorium. The mass enhanced diffusely after intravenous Gadolinium injection and the dural tail sign was positive suggesting the diagnosis of tentorial meningioma (Figure 1A,B). There was no edema in the surrounding brain tissue.

The patient underwent a craniotomy that uncovered the left suboccipital area and posterior fossa. The well-encapsulated, firm and yellowish tumor mass was broadly based on the tentorium just anterior to the left transverse sinus. There was no clear dissection plane between the tumor and the tentorium and the tumor extended from the posterior fossa to the suboccipital area through the tentorium. The tumor was totally excised with the help of an ultrasonic surgical aspirator and the adjacent tentorium was also excised. No relationship with any cranial nerve was observed during surgery. The histopathological examination of the tumor revealed an encapsulated hypercellular tumor composed entirely of spindle cells with fusiform and tapered nuclei (Figure 2A,B). Hyaline thickening of vessel walls, histiocytes and nuclear degenerative changes were not observed in the histopathological examination of the specimens. Mitotic figures, intranuclear inclusions, cellular whorls and psammoma bodies were also absent. There was widespread S-100 protein reactivity in the tumor tissue with immunoperoxidase stain (Figure 2C), but the cells did not express epithelial membrane antigen (EMA) or CD34. Silver staining revealed dense intercellular reticulin fibers (Figure 2D). Ki-67 proliferation index was less than 1%. These findings were consistent with the diagnosis of schwannoma. The rest of the clinical course was uneventful and the patient was released from the hospital without any neurological deficit.

DISCUSSION

Intracranial schwannomas rarely originate from atypical locations such as tentorium, petroclival intradural region, intrasellar region, falx or tuberculum sellae (7,9,16). Several hypotheses have been stated for the possible origin of these

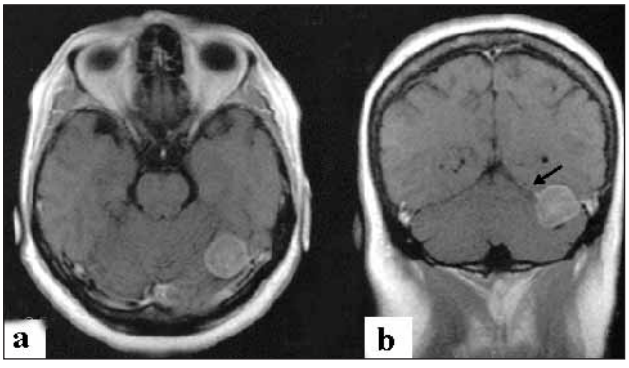

Figure 1: *Cranial axial (**A**) and coronal (**B**) MRI examination showing a 22x24 mm extra axial, well-demarcated, mass lesion based on the left tentorium. The mass enhanced diffusely after intravenous Gadolinium injection and the dural tail sign was positive (black arrow).*

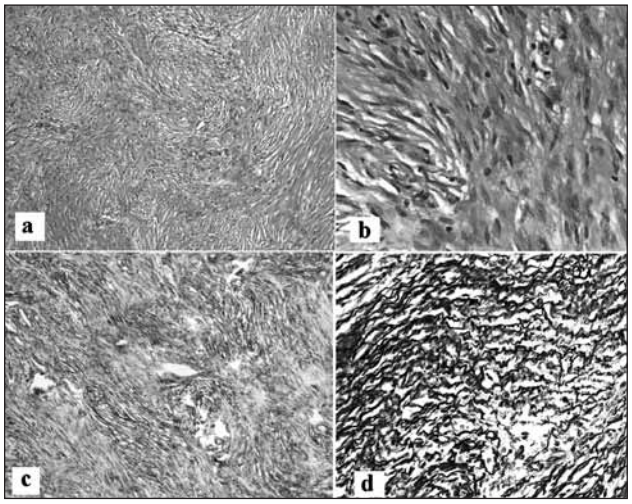

Figure 2: *Histopathological examination of the tumor showing an encapsulated hypercellular tumor composed entirely of spindle cells with fusiform and tapered nuclei (**A,B**) HEx10 and HEx40. There was widespread S-100 protein reactivity in the tumor tissue with immunoperoxidase stain (**C**) S-100 x40. Silver staining for reticulin highlighted a rich reticular network around individual cells (**D**) x40.*

abnormally located dural schwannomas such as misplaced myelinated nerve fibers, displaced neural crest cells, perivascular schwann cells or dural branches of the trigeminal nerve (12-15). In our case, the tentorium was invaded by the tumor and this finding might suggest that origin of the tentorial schwannoma could be the normally existing schwann cells surrounding the tentorial branches of the trigeminal nerve. To date, only six tentorial schwannomas have been reported in the literature and the age range was 9-41 years (1-3,5,8,9). The clinico-pathological and radiological features of these cases were summarized in (Table I). No association with tentorium schwannomas and neurofibromatosis was described in these reports and our patient did not present any sign of neurofibromatosis either. The common clinical presentation was headache but two patients had accompanying ataxia and sixth nerve palsy. Our patient is the eldest of them and presented only with headache.

Regarding the differential diagnosis, solitary fibrous tumor (SFT) and hemangiopericytoma may mimic schwannoma on histopathology, particularly when the more cellular Antoni-A pattern is dominant. Immunohistochemically, S-100 protein is diffusely positive in schwannomas, while SFT is negative for this antibody and has strong diffuse positive staining for CD34 (11). Another spindle cell tumor seen in central nervous system is the hemangiopericytoma and these tumors also lack the immunohistochemical features of schwannoma. Hemangiopericytomas express CD34 to some extent and usually do not stain with the antibody for S-100 protein (11). The most important differential diagnosis is meningioma, particularly the fibrous subtype. Histopathological features of a typical schwannoma, such as the presence of nuclear

Table I: Summary of previously reported tentorium based schwannoma cases.

Case No		Age/ Sex	CT	MRI	Histopathology	Immuno-histochemistry	Electron Microscopy
1	Flickinger et al. 1988	22/ M	Homogenously enhanced mass, Calcification (+)	T1-isointense, T2-isointense	Diffusely cellular tumor, Antony-A type	N/A	Schwann cells with basement membrane
2	Oikawa et al. 2002	41/ F	N/A	Heterogenously enhanced cystic&solid mass, Dural tail (+)	Spindle cells and palisade structures	S-100 (+) Vimentin (+) Reticulin (+) EMA (-) GFAB (-)	Schwann cells with basement membrane, Interdigitating cellular processes
3	Jabbour et al. 2002	9/ F	N/A	T1-hypointense, homogenous enhancement, Dural tail (+)	Variable cellularity, Fibrillary background, Spindle cells, Nuclear palisading	S-100 (+) Vimentin (+) NSE (+) EMA (-) GFAP (-) Synaptophysin (-)	N/A
4	Ozawa et al. 2003	29/ M	Partly cystic isodense mass, Calcification (-)	T1-isointense, T2-isointense, Homogenously enhanced, Dural tail (+)	Spindle cells in loose textured area, Antony-A and Antony-B areas, Nuclear palisading	N/A	N/A
5	Du et al. 2003	17/ F	Heterogeneously enhanced cystic mass, Calcification (-)	Heterogeneously enhanced cystic mass, Dural tail (-)	Schwannoma with foci of cystic degeneration	S-100 (+) EMA (-) Cytokeratin (-)	N/A
6	Anton et al. 2006	23/ M	Heterogeneously enhanced cystic mass, Edema (+)	T2-hyperintense, Homogeneous enhancement, Dural tail (-)	Spindle cells, Reticulin fibers, Antony-A type, Nuclear pseudopalisading	S-100 (+) Vimentin (±) GFAP (±) Pancytokeratin (±) EMA (-)	Intercellular junctions

EMA: epithelial membrane antigen; *GFAP*: glial fibrillary acidic protein; *NSE*: neuron specific enolase.

palissading and Antoni type A and Antoni type B histological patterns, usually enable the microscopic differentiation of schwannoma from meningioma. However, confirmatory immunohistochemical and/or electron microscopical studies can sometimes be necessary. Fibrous meningiomas are characterized by whorls of cells, nuclear pseudo-inclusions and psammoma bodies and are positive for EMA and vimentin on immunohistochemistry (11). Staining for S-100 protein, although typical of schwannomas, is not reliable since approximately 20% of meningiomas and 80% of fibrous variants are positive for this protein (11). Reticulin is helpful for distinguishing these neoplasms from each other, as schwannomas demonstrate extensive pericellular distribution of reticulin fibers that is not seen in meningiomas. Our case showed strong S-100 protein reactivity and dense intercellular reticulin staining but did not express epithelial membrane antigen (EMA) or CD34, supporting the diagnosis of schwannoma. Ultrastructurally, schwannomas are characterized by the presence of a basement membrane surrounding the tumor cells, long-spacing collagen among the interstitial cells in the form of Luse bodies, interdigitating cellular processes and by the absence of intercellular junctions (1,4,8,17). Although it has been reported that amorphous basement membrane-like material may be demonstrated between meningothelial cells, meningioma cells are not surrounded by a true basement membrane (6). We were not able to examine our case by electron microscopy.

For the preoperative diagnosis of dura-based schwannomas, MRI is more sensitive than computerized tomography. However, radiological findings of these tumors may overlap. Both tumors may have similar signal characteristics on T1- and T2- weighted images on MRI and both may have calcifications (3). Furthermore, both can markedly enhance after intravenous contrast media injection and the presence of a dural tail sign, which was previously thought to be specific for meningiomas, in schwannomas can cause confusion with the diagnosis of meningioma (8,10). One of the most important preoperative parameters in distinguishing schwannoma from meningioma is the location of the tumor. However, definitive diagnosis is always provided by the histopathological examination.

In conclusion, tentorium-based schwannoma is a rare clinical entity with an unknown origin and should be considered in the differential diagnosis of tentorial tumors. Radiological techniques are not always helpful in distinguishing tentorial schwannoma from meningioma, although both lesions are benign and can be completely removed by surgery.

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