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Case Report

Meningeal Solitary Fibrous Tumor

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We report a rare case of a patient with meningeal solitary fibrous tumor. A 60-year-old woman presented with right leg monoparesis. Brain magnetic resonance imaging demonstrates a well enhancing huge mass, located in left parietal lobe. Cerebral angiography demonstrating increased vascularity in area of the tumor, which had feeder vessels extending from the internal carotid artery and external carotid artery. A presumptive diagnosis of meningioma or hemangiopericytoma was considered. At surgery, the consistency was firm and had destroyed the dura and skull. A gross total resection was performed. Immunohistochemically, tumor was strongly, and widely, positive for CD34 and vimentin. There was no staining for epithelial membrane antigen(EMA), S-100 protein, cytokeratin, and glial fibrillary acidic protein (GFAP). Differential diagnosis of intracranial solitary fibrous tumor includes fibroblastic meningioma, meningeal hemangiopericytoma, neurofibroma, and schwannoma.

KEY WORDS : Solitary fibrous tumor · CD34 · Meningeal tumor.

Introduction

Intracerebral solitary fibrous tumors(SFTs) are rare, benign mesenchymal neoplasm[2]. In 1931, Klemperer and Rabin first described solitary fibrous tumor, a rare tumor that occurs most often in the visceral pleura[5]. SFT can mimic other benign or malignant spindle cell tumors. We present a case of meningeal SFT. The meningeal involvement of solitary fibrous tumor is rare and there has been less than 100 cases reported previously in literature. The clinical, radiological, and pathological features of this tumor, including light microscopic and immunohistochemical features, are delineated and differential diagnosis is discussed.

Case Report

A 60-year woman presented with a 4-year history of right leg weakness. The neurological examination at admission revealed mild weakness on right lower extremity. Brain magnetic resonance imaging(MRI) demonstrated a huge well enhancing mass, located in left parietal lobe and attached the superior sagittal sinus (Fig. 1). Cerebral angiography demonstrating increased vascularity in area of the tumor, which had feeder vessels extending from the internal carotid artery and external carotid artery, and superior sagittal sinus was occluded by the tumor.

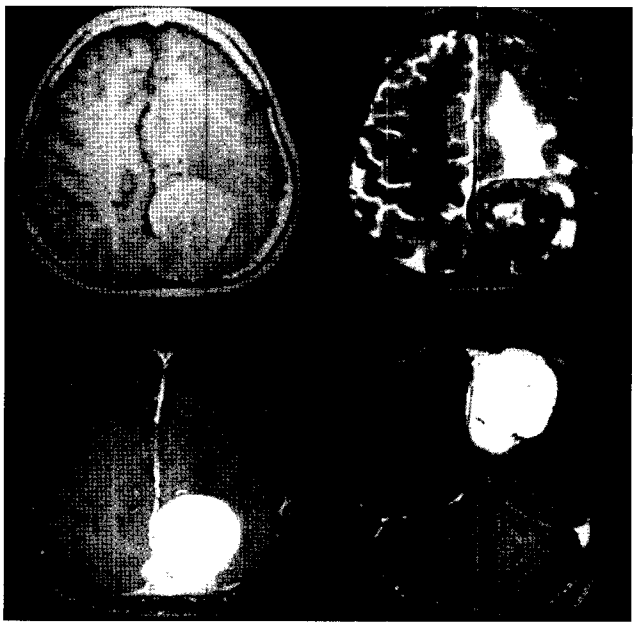

Fig. 1. Magnetic resonance imaging demonstrates a huge mass, which is marked enhanced in the left parietal lobe and involved the superior sagittal sinus.

Operation and Pathologic Finding

Gross total excision of the lesion was achieved by paramedian parietal craniotomy with neuronavigation guidence. The tumor was grayish in color, firm in consistency and attached to the dura, and had destroyed the dura mater. The tumor invaded the superior sagittal sinus, and superior

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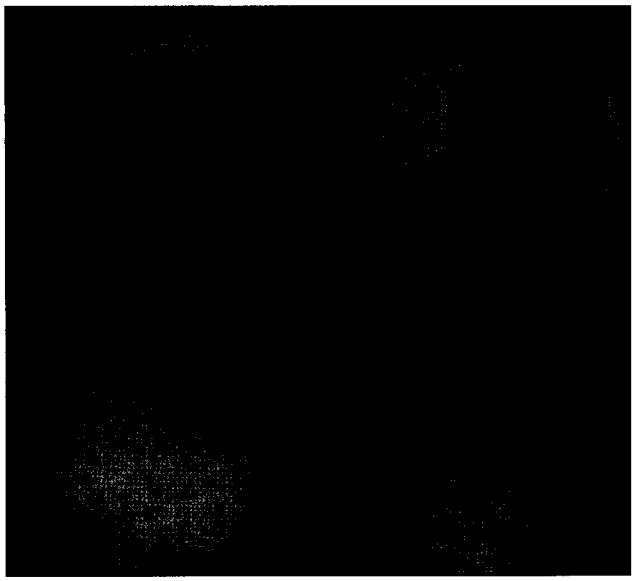

Fig. 2. Cerebral angiography demonstrating increased vascularity in area of the tumor, which had feeder vessels extending from the internal carotid artery and external carotid artery, and superior sagittal sinus was occluded by the tumor.

sagittal sinus was occluded by the tumor. The tumor was extraaxial mass and attached to meninges with bony hyperostosis. The tumor was debulked initially and dissected along the tumor plane. The superior sagittal sinus was ligated and gross total removal was achieved including a nubbin of tumor that had penetrated the superior sagittal sinus.

Tissues were fixed in 10% formaldehyde, embedded in paraffin, and stained hematoxylin stains. S-100 protein, glial fibrillary acidic protein(GFAP), cytokeratin, viemntin, CD34, epithelial membrane antigen(EMA), actin, p53, desmin, and

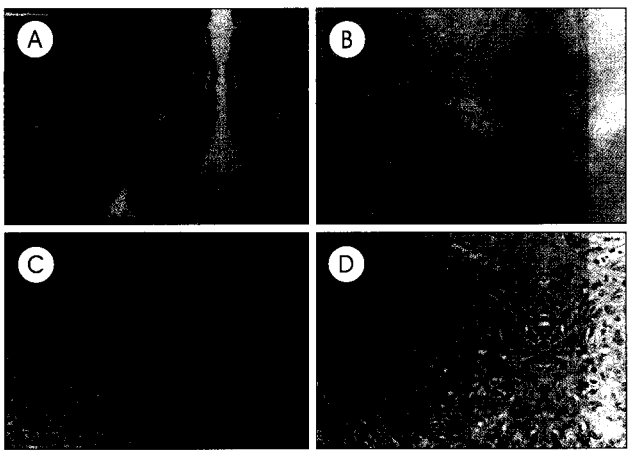

Fig. 3. The tumor shows highly cellular spindle cell tumors A : a collagen-rich background, and exhibiting regional variation B : Tumor cells have enlongated nuclei with a delicate chromatin pattern, and scant eosinophilic cytoplasm. Few mitotic figures are also noted D : But there is no intranuclear inclusions, cellular whorls, or psammoma bodies (A. H & E, ×40, B. ×40, C. ×100, D. ×200).

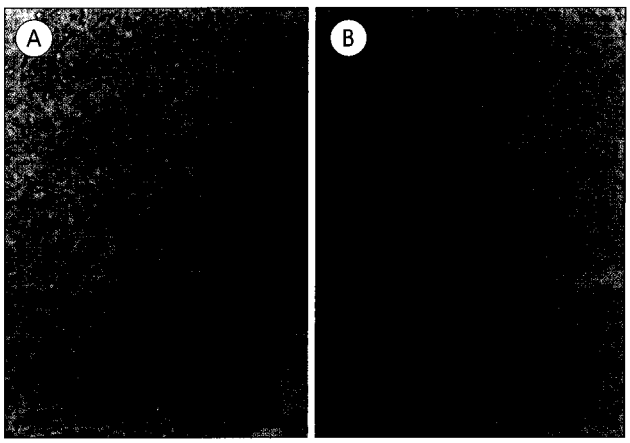

Fig. 4. Immunohistochemically, The tumor is strongly, and widely, positive for CD34. There is no staining for glial fibrillary acidic protein (GFAP) (A.×100, B.×100).

Ki-67 (MIB-1) proliferation-related labeling index were studied for immunohistochemical procedures. Microscopically, the tumor disclosed dura-attached solid tumor, which is composed of haphazardly arranged oval to spindle cells with numerous variable sized vascular structure. The tumor showed highly cellular spindle cell tumors in a collagen-rich background, and exhibited regional variation. Tumor cells had enlongated nuclei with a delicate chromatin pattern, and scant eosinophilic cytoplasm. Few mitotic figures were also noted. But there was no intranuclear inclusions, cellular whorls, or psammoma bodies (Fig. 3).

Immunohistochemically, the tumor was strongly, and widely, positive for CD34 and vimentin. There was no staining for EMA, S-100 protein, cytokeratin, and GFAP (Fig. 4). On the basis of these findings, the final diagnosis of these tumor was solitary fibrous tumor.

The patient made a rapid postoperative recovery. The preoperative symptom resolved completely. One year after surgery, neurological status remains stable, with no radiographic evidence of disease progression on MRI scans (Fig. 5).

Discussion

Intracerebral solitary fibrous tumor is a newly described clinical entity. The rarity of benign intracerebral SFT has currently been related to paucity of true connective elements within the central nervous system[7]. Their histogenesis is still unknown. The main differnetial diagnosis of intracranial SFT includes fibrous meningioma and hemangiopericytoma. Fibrous meningiomas can be identified by the immunohistochemical pattern, but preoperative differential diagnosis based on neuroimaging is difficult[3,11]. T2-weighted MR

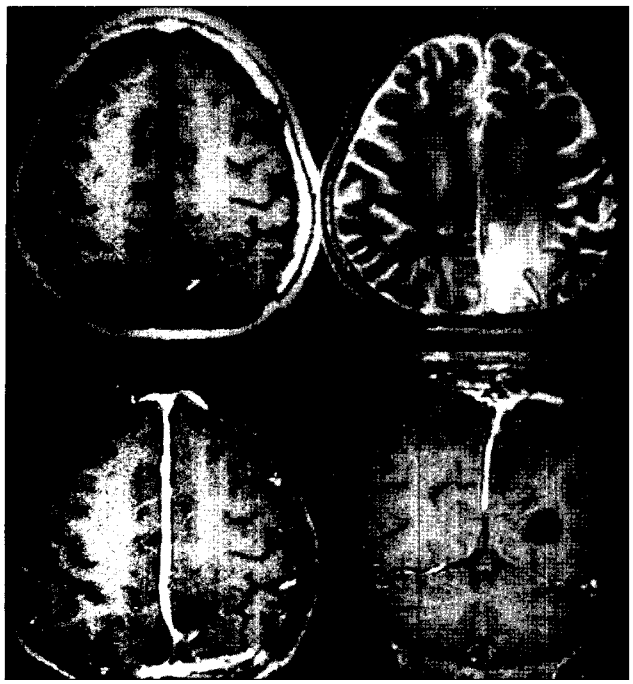

Fig. 5. Postoperative magnetic resonance images show total removal of the parasagittal mass and no radiographic evidence of recurrence.

imaging is useful for excluding hemangiopericytomas.

Hemangiopericytomas do not contain the areas of thick bands of collagen which appear as hypointense on the T2-weighted images[3,11]. Strong immunoreactivity for CD34, as in this cases, is helpful for making the diagnosis[3,4,11,12], but such findings are not specific for SFT[11].

On MRI, SFT are well defined, enhancing, homogeneous, or slightly heterogeneous, lesions with intermediate T1-, and low T2, signal. It has been suggested that relatively hypo- and hyperintense areas on T2-weighted images corespond, respectively, to collagenous and hypercellular regions of tumor[9]. Thickened dural tail, hyperostosis, skull erosion, and capping cysts may all be seen[3,10,12,13]. In general, radiological appearences of SFT are non-specific and would suggest the diagnosis of meningioma.

Despite some morphological similarities to other spindle-cell tumors such as fibrous meningioma, schwannoma, and meningeal fibrosarcoma or myofibroblastoma, the immunohistochemical pattern of SFT is distinctive[3,11]. SFT are strongly positive for CD34 and vimentin, with no staining in the tumor itself for the neural crest markers, S-100 protein, GFAP, EMA, cytokeratin or vascular antigens[4,11]. The histopathologic features of SFT may mimic fibrous meningiomas, but the fibrous meningiomas can be excluded by the presence of storiform pattern, calcification of collagen and psammoma bodies, and frequent positive staining for EMA and S-100 protein[12]. It should be noted, however, that CD34 is not specific for SFT as weak, usually patchy, staining may be seen in meningiomas, neurofibromas, and hemangiopericytomas[4,11]. As with all tumors, however, the overall histological appearances and immunohistochemical pattern must be considered together.

Conclusion

We have reported a case of meningeal SFT. SFT should be included in the differential diagnosis for extra-axial brain lesions. Experience with SFT would suggest that whatever the extent of surgical resection, and regardless of their histological appearance, meningeal SFT should be followed with great care in the long-term.

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