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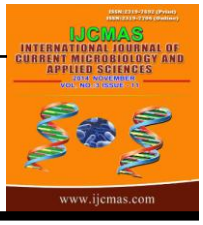

Original Research Article

Angiomatous meningioma in 49 years old male - A rare case report

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Keywords

Intracranial tumors, Angiomatous meningioma, Histo-pathological examination

A B S T R A C T

Meningiomas comprise 15–18% of intracranial tumors in adults and 33% of all incidental intracranial neoplasms. Angiomatous meningioma is a rare subgroup of meningiomas in which numerous vascular channels prevail and constitute 2.1% of all meningiomas. Here, we are presenting a case of 49 years old male patient presented with headache and diagnosed as angiomatous meningioma. Nowadays various modalities are available for the diagnosis e.g. newer radio-imaging methods, clinical findings, histopathological examination and immunohistochemistry (IHC). Though there is availability of excellent neuroimaging methods, histological examination and immune-histochemistry are the gold standard tools for the final diagnosis.

Introduction

In adults, 15–18% of all intracranial tumors and 33% of all incidental intracranial neoplasms are meningiomas (Perry *et al.*, 2007). They arise from meningothelial cells found in the arachnoid villi, the arachnoid membrane, tela choroidea and choroid plexus. The most common presenting symptom is headache which is seen in 80% of cases. Patients may present with other symptoms like visual disturbances, cognitive changes and seizures (in 27% of cases) (Liu *et al.*, 2007). There are many subgroup of meningioma out of them angiomatous meningioma is rather rare which constitute 2.1% of all meningiomas (Martin *et al.*, 2004). Histologically, angiomatous meningioma has numerous vascular channels and at least focal classic meningioma morphology. Angiomatous meningioma has distinctive radiological and histopathological features compared to other meningiomas. Here, we are presenting a case of 49 years old male patient where we were able to find and document the typical features of angiomatous meningioma.

Case report

49 years old male patient presented with complain of headache and disorientation since 1 year. His general and central nervous system (CNS) examination was normal. All haematological and serological tests were not showing any abnormality. Magnetic Resonance Imaging (MRI) of brain showed meningioma at left posterior parietal region. Patient underwent surgery of craniotomy with total excision of tumor. The tumor

tissue was sent to histopathology department. Tumor tissue was fixed in 10% formalin solution and routinely processed. Sections from the paraffin block were cut with thickness of 5 micron and stained by hematoxylin and eosin (H&E) stain.

Microscopic examination showed that tumor tissue was highly vascular with meningeal cells arranged in nests and pallisading pattern. Cells had delicate round to oval nuclei and eosinophilic cytoplasm. There was also presence of abundant small capillary like thin walled blood vessels. Hyalinization of vessels wall was also seen. There was no evidence of any atypia or malignancy seen. Final impression was given as angiomatous meningioma (WHO grade I) (Photo 1, Photo 2, Photo 3, Photo 4).

Discussion

Meningioma is regarded as a benign neoplasm, which commonly arises from the arachnoid cap cells of the cerebrum and the spinal cord (Kim *et al.,* 2009). Angiomatous meningioma is an uncommon variant of all meningiomas and having predilection for the cerebral convexity (Martin *et al.,* 2004). Angiomatous meningioma (AM) demonstrates some distinct features compared to other benign meningiomas. Meningioma in general shows female preponderance. In study by Martin *et al.* (2004) showed that the male to female ratio for angiomatous meningioma is much higher than that for meningioma in general.

Our patient presented with headache and disorientation, out of which headache is the most common presenting symptom of angiomatous meningioma. Metastasis is quite rare in meningioma which constitutes only 0.1% of cases. Hematogenous route of metastasis is more common and it is more frequent for those meningiomas that invade dural sinuses. Involvement of lungs by metastasis constitutes 60% of the cases (Figueroa *et al.,* 1999).

Nowadays, with availability of CT scan and MRI, the incidence of diagnosing various variant of meningioma has increased. Meningiomas show isointensity or hyper intensity to the cerebral cortex in magnetic resonance imaging (MRI). The most important diagnostic feature is short extension of contrast enhancing tissue along the dura which is also known as dura tail.

Radiographically, there is no other additional feature to help in subclassification of meningiomas, though angiomatous meningioma (in spite of belonging to WHO grade I) shows perilesional edema. Tamiya, *et al.* had noticed that the histologic subtypes meningothelial, anaplastic, microcystic and angiomatous exhibited higher edema indices than other variants (Tamiya *et al.,* 2001). As various imaging studies are not very useful for final diagnosis. So early stereotactic biopsy is needed to establish the diagnosis and is recommended (Rahul Goyal *et al.,* 2014).

On histopathology, angiomatous meningioma is chararcterised by abundance of well-formed vascular channels, sinusoids or capillaries. The study by Martin *et al.* (2004) showed two subtypes of angiomatous meningioma, viz., microvascular subtype (more than 50% contain vessels with diameter below 30 μ), and a macrovascular subtype. These tumors may also display microcystic change along with foamy cells (which are related to leakage of plasma lipids across thin vessel walls); in addition to solid areas with meningotheliomatous meningioma elements.

World health organization (WHO) has subclassified all central nervous system

(CNS) tumors including meningioma into various grades. Meningiomas have been categorized into grades I, II, and III based on increased cellularity, high nucleocytoplasmic ratio, large prominent nucleoli, patternless sheets, mitosis, and spontaneous or geographic necrosis. Hence, a workup would be incomplete without the assessment of grade. Counting the mitotic figures is quite subjective and an objective method of evaluating proliferative activity is by performing Ki-67/MIB-1 immuno-staining on tissue sections. In our case, the tumor was reported as angiomatous haemangioma WHO grade I.

The differential diagnosis of angiomatous meningioma includes vascular tumors like hemangiopericytoma and capillary hemangioblastoma (Rao *et al.*, 2008). But microscopically, haemangiopericytoma consisted of tightly packed spindle shaped cells surrounding ramified thin-walled endothelium-lined vascular channels with characteristic 'antler' or 'staghorn' configuration (Rathod *et al.*, 2014). Capillary hemangioblastoma microscopically is characterized by thin-walled blood vessels lined by plump endothelial cells and separate groups of polygonal stromal cells. Immunohistochemical stains play a crucial role in differentiating hemangiopericytoma from angiomatous meningioma and hemangioblastoma. Hemangiopericytoma are immunoreactive to vimentin and endothelial antigen CD34 but stain negatively with Epithelial Membrane Antigen (EMA). Stromal cells of hemangioblastomas are immunoreactive to vimentin, neuron-specific enolase, S100, Glial fibrillary acidic protein, and calponin but fail to stain with EMA and prognosis is generally excellent. Angiomatous meningioma is immunoreactive for EMA, vimentin and S-100 protein, which confirm a diagnosis of angiomatous meningioma. Further confirmation may be done by electron microscopic study. Ultrastructurally, neoplastic meningeal cells have prominent cytoplasmic processes and well-defined junctions. Precise diagnosis is must for angiomatous meningioma because it is associated with good prognosis as compared with other differential diagnosis. Gross total resection is the treatment of choice (Mehta *et al.*, 2014) and our patient also underwent the surgery of craniotomy with total resection of tumor.

Photo.1 Solid areas with meningotheliomatous meningioma elements (4 X, H & E Stain)

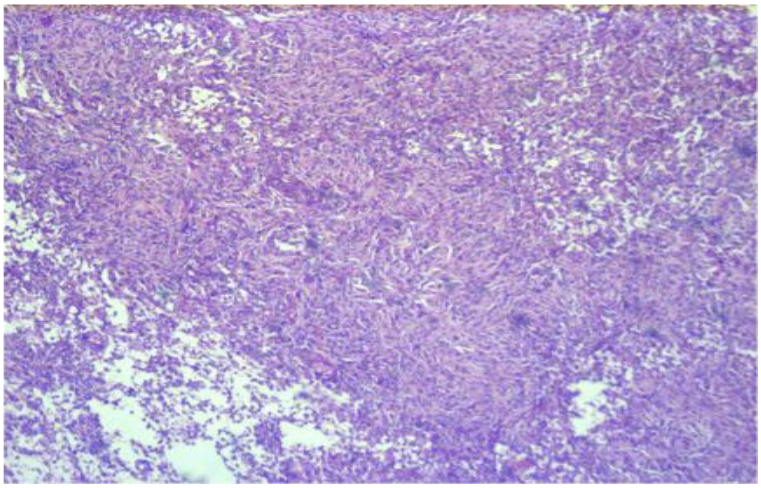


Photo.2 Neoplastic meningiothelial cells with angiomatous patterns.. (4X, H & E Stain)

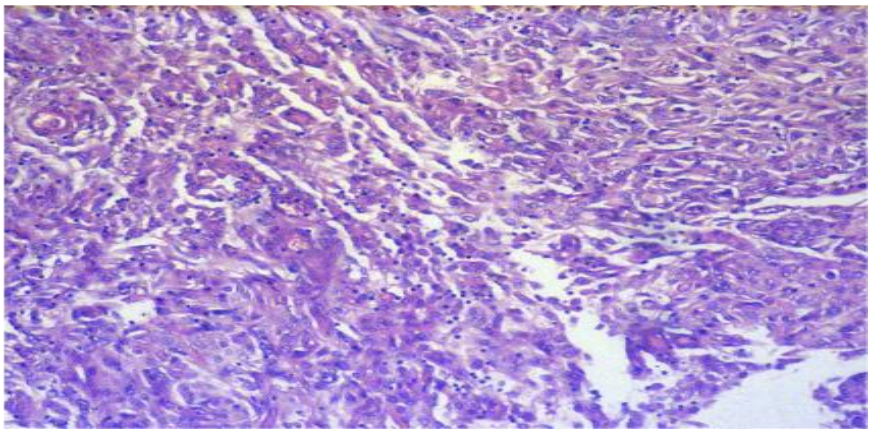


Photo.3 Angiomatous pattern and microcyst formation (40 X, H & E Stain)

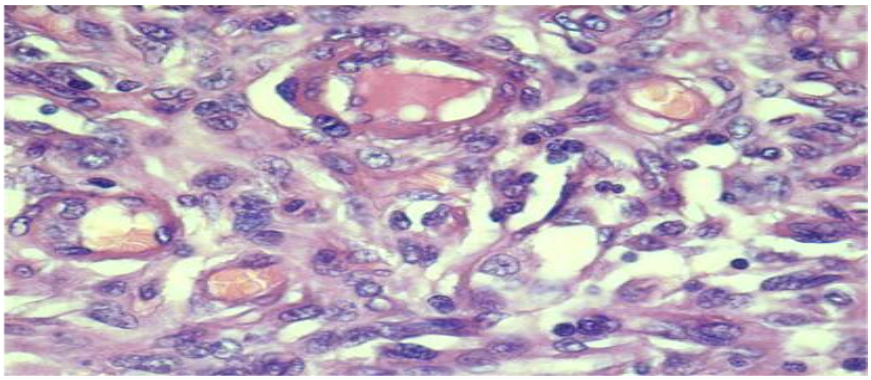
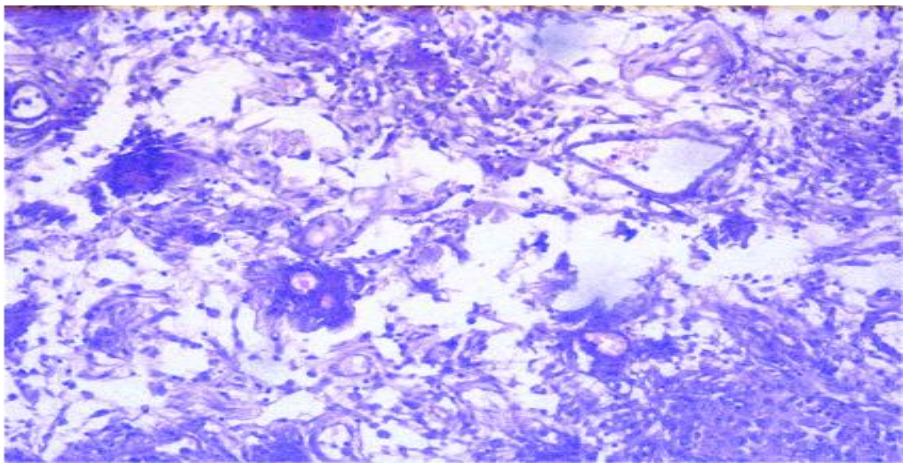


Photo.4 Abundant well-formed vascular channels (4 X, H & E Stain)



We can say that angiomatous meningioma is a rare variant of meningioma with few distinctive radiological and histo-pathological features. The differential diagnosis includes other vascular neoplasms like hemangioblastoma and hemangiopericytoma. Though there is availability of excellent neuroimaging methods, histological examination and immune-histochemistry are the gold standard tools for the final diagnosis.

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