**A RARE CASE OF INTRA-PARENCHYMAL MENINGIOMA IN A FEMALE PATIENT WHO PRESENTED WITH SEIZURES: A CASE REPORT**

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**ABSTRACT:**

Meningiomas are slow growing neoplasms which arise from the meningothelial cells of the arachnoid cap cells. Unlike other meningiomas, intraparenchymal meningiomas do not originate from dura. Intraparenchymal meningiomas are more common in males and develop earlier than regular meningiomas. Because of the rare occurrence the intraparenchymal meningiomas, they are commonly misdiagnosed.

**Key Words:** Fibrous Meningioma, Seizures, Intraparenchymal, Granulomatous

**INTRODUCTION:**

Meningioma is the most prevalent benign intracranial tumour. These tumours develop from cells known as arachnoid cap cells which is found in the thin membrane that covers the brain and spinal cord. Majority of the meningiomas are benign, but if they go unnoticed, can develop slowly until they are quite large and, in certain cases, can be fatally devastating [1].

When discussing a meningioma diagnosis with patients, medical practitioners frequently use the WHO classification system [2]. Meningiomas are divided into three main types according to the WHO classification of central nervous system (CNS) malignancies, which is reflected in the WHO grades I (benign), II (intermediate), and III (malignant) [3].

Even though meningiomas typically have a Dural connection, intra-parenchymal and sub-cortical meningiomas do not originate from dura. Intra-parenchymal meningiomas are more common in males and develop earlier in age than regular meningiomas [4]. There is still much to learn about the pathogenesis of intra-parenchymal meningiomas. It is believed that they can develop from ectopic meningothelial cells in the stroma of the choroid plexus or the pia mater, which as a result of changes in cell migration, can cause intra-ventricular meningioma. It has been discovered that fibrous variants of intra-parenchymal meningiomas are the most frequent, accounting for 44% of all cases [5].

Intra-parenchymal meningiomas are frequently mistaken for other intra-cranial space occupying lesions (ICSOLs) such as metastatic tumours, gliomas etc.  It is quite challenging to appropriately diagnose these lesions, especially when they have rare meningioma traits, like cystic components. It is essential to understand the characteristics of intra-parenchymal meningioma and make an accurate pre-operative diagnosis because meningiomas require a different treatment plan and surgical techniques than gliomas or metastatic tumours [4]. Here, we have reported an illustrative case of primary intra-parenchymal meningioma in a 43-year-old female with history of complex partial seizures.

**CASE REPORT:**

A 43-year-old female presented to the emergency department (ED) with a history of complex partial seizures. She was evaluated at a nearby hospital and CT (Computed Tomography) scan of the brain was suggestive of two frontal granulomatous lesions and she was started on empirical anti-tuberculous treatment (ATT). She again developed an episode of seizure in April 2011. Magnetic resonance imaging (MRI) brain showed two frontal space occupying lesions. CT scan of the Chest and Abdomen was also done to look for tuberculous primary which was negative. She was again started on ATT and anti-epileptics.

She was asymptomatic till November 2014, then developed another episode of seizure. A repeat MRI Brain showed an increase in size of the lesion with mass effect. She was advised surgical excision. But the patient was not willing for surgery.

She was asymptomatic till March 2017. Later developed inability to use the right upper limb and lower limb on and off. She also had blocking sensation of the right ear. There were no further seizure episodes since the last episode in 2014. She did not have headache, vomiting, visual disturbance and seizures.

MRI scan was repeated which showed an increase in size of the lesion when compared to the last scan and significant mass effect over the left lateral ventricle and midline shift of 5 mm to the right and displacement of cortical branches of the right middle cerebral artery (MCA) medially by the lesion. The mass was hypointense on T1-weighted images and hyperintense on T2-weighted images. A CT perfusion study showed a well marginated hyperdense extra axial lesion in the posterior aspect of left Sylvian fissure (Figure 1 A and B). The lesion showed very high perfusion with increased cerebral blood volume, flow and reduced mean transit time.

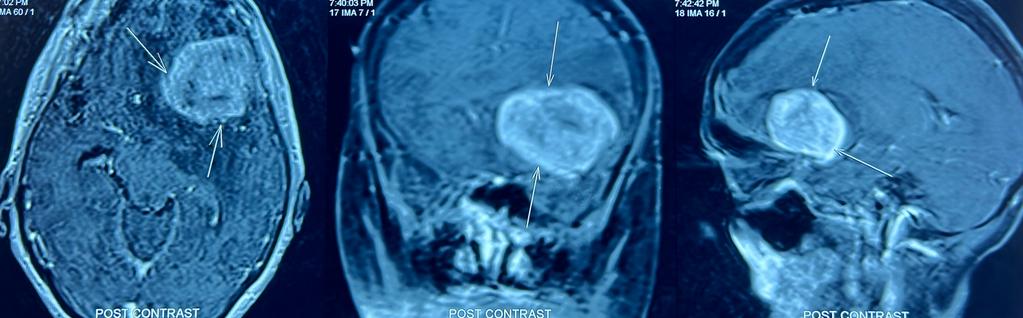


Figure 1. A and B: CT scan showing a well marginated hyperdense extra axial lesion in the posterior aspect of left Sylvian fissure

On examination, she was conscious, oriented, afebrile, pupils were equal and reacting, extra-ocular movements were full and no other deficits. Her motor power was normal in all limbs. She did not have any sensory deficits. A full cognitive assessment shows poor attention and concentration, delayed recall and visual retention.

All the baseline investigations were done and she was prepared for awake craniotomy. She underwent a left fronto-temporal craniotomy and gross total excision of the tumour. At surgery, the tumour was intra-axial, firm, and highly vascular. There was no attachment to the dura. It was mainly in the posterior part of the sylvian fissure and had a good plane with the surrounding brain. There were many feeders from the MCA which were coagulated and cut. In the post-operative period, there were no neurological deficits. Post operative CT scan of the brain showed total excision of the lesion.

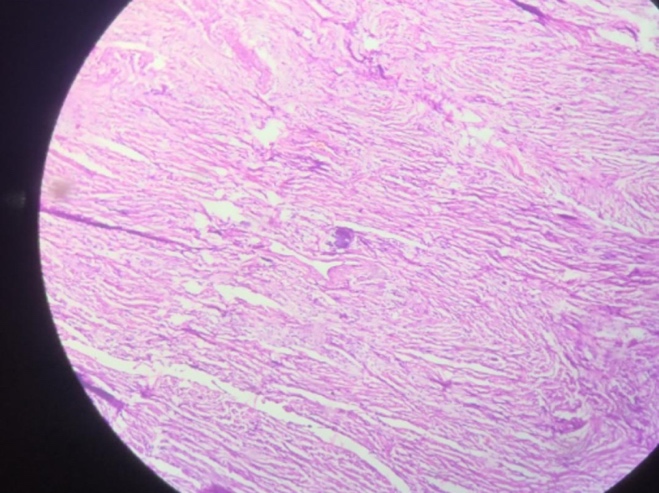
The biopsy was reported as WHO grade I Fibrous meningioma (Figure. 2). Immunohistochemistry showed S100 focal nuclear expression, EMA, CD34 and p53 negative with a Ki-67 of 5%. She was discharged on anticonvulsants. At 6 months follow up there has been no recurrence.

Figure 2: Histopathological image shows a tumour composed of neoplasticism meningothelial cells arranged as fascicles. Occasional psammoma bodies can be seen (10x)

**DISCUSSION:**

Meningiomas are slow growing neoplasms which arise from the meningothelial cells of the arachnoid cap cells. These cells are concentrated in the walls of the major venous sinuses hence the Dural origin of most of these tumours. Meningiomas without Dural attachment are rare. They are known to occur in the intraventricular region, pineal region and also intraparenchymal. They have been classified by Cushing and Eisenhardt[6] into 4 types: 1) plexus choroidal tutors, 2) telae choroidal tumours, 3) deep sylvian psammameningiomas, 4) extracerebellar psammomeningiomas.

Because of the rare occurrence the intra-parenchymal meningiomas are commonly misdiagnosed as in our case as granulomatous lesions, gliomas, cavernous angiomas, lymphomas or metastatic tumours. Since the treatment strategy and operative techniques differ from meningiomas and other lesions it is essential to identify these tumours pre-operatively. A total of 32 cases of Sylvian meningiomas and 39 cases of intra-parenchymal meningiomas have been reported in the world literature till 2016 [7].

These tumours probably arise from the arachnoid cap cells in the arachnoid and pia of the sylvian fissure and enter the surface of the brain or along the Virchow–Robin spaces along the branches of the middle cerebral artery. It has also been speculated that the arachnoid cells rest during the migration process leading to development of meningiomas [8,9].Intraparenchymal meningiomas more commonly occur in the paediatric age group whereas the Sylvian meningiomas more commonly occur in adults [7]. Adult meningiomas most commonly occur in females but intraparenchymal / Sylvian meningiomas most commonly have been described in males [7].The most common presentation is seizures and other interesting feature is that they rarely present with neurologic deficits [10].

Meningiomas are usually supra-tentorial and the frequency of intraparenchymal meningiomas was also similar to that of the ordinary meningiomas [11,12]. The imaging characteristics of meningiomas are usually hyper-density on CT, iso-intensity on T1W images and iso to high on T2W images with intense contrast enhancement on CT and MRI [13]. Mori et al. have described enhancement along the middle cerebral artery branch, similar to the dura tail seen in meningiomas with attachment to the dura matter [14]. In our case the cortical branches of the middle cerebral arteries were displaced medially and there was no enhancement along the middle cerebral arteries.

Gross total resection of the intraparenchymal / Sylvian meningiomas is the standard treatment [15]. When sub-total resection only has been performed adjuvant radiation can be given [16,17]. Most of these tumours are WHO grade I, the reported cases are of fibroblastic, transitional, meningothelial, or psammomatous types. Rarely anaplastic variants have also been reported [7].

Zhang et al have classified the supratentorial meningiomas into 5 types such as:

(1) Intraventricular meningiomas (2) Pineal region meningiomas (3) Deep sylvian meningiomas (4) Intraparenchymal or Subcortical meningiomas (5) Others [18]. There has been a controversy as to whether Sylvian and intraparenchymal meningiomas are the same category or different. Patients with Sylvian fissure meningiomas were older than intraparenchymal meningiomas but the rest of the features were same [7]. Gross total resection could not be achieved in approximately 30% of the Sylvian meningiomas whereas 90% of the intraparenchymal meningiomas have underwent gross total excision. In our case we were able to achieve a gross total excision. While comparing the histopathology the intraparenchymal meningiomas are approximately 75% WHO Grade I whereas Sylvian meningiomas are 85% WHO Grade I.

Considering these differences, it is better to classify and differentiate intraparenchymal meningiomas from Sylvian meningiomas. Preoperative work-up and clinical suspicion helps in achieving an optimal outcome in these patients.

**CONCLUSION:**

In conclusion, this case report highlights a rare presentation of intra-parenchymal meningioma, which is a benign tumour that can affect the brain tissue. The patient's symptoms and imaging findings indicated the presence of a mass, and a biopsy confirmed the diagnosis of meningioma. The patient underwent successful surgical removal of the tumour, and postoperative imaging showed complete resection of the mass. This case serves as a reminder of the importance of a high index of suspicion for intracranial tumours, even in the presence of unusual symptoms and imaging findings.

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**CONFLICTS OF INTEREST:**

None declared.

**AUTHOR CONTRIBUTION:**

All the authors contributed equally in drafting, editing, revising and finalizing the case report.

**ETHICAL APPROVAL:**

The ethical approval was not required for the case report as per the country’s guidelines.

**CONSENT:**

Written informed consent was obtained from the patient to publish this report.

**DATA AVAILABILITY STATEMENT:**

The data that support the findings of this article are available from the corresponding author upon reasonable request.

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