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Case Report

Surgical excision of frontal meningioma in pregnancy

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ABSTRACT

We report a case of a pregnant woman at 33+3 weeks period of gestation presenting with recurrent seizure episodes without a background of hypertension. Neuroimaging revealed a well-defined extra-axial meningioma along the anterior falx in right frontal paramedian location. The patient underwent right frontal craniotomy with Simpson grade II excision with Caesarean delivery in same setting. A multidisciplinary team approach involving obstetricians, neurosurgery, and anesthesiology was employed to optimize maternal and fetal outcomes. Gross total resection of the tumour was achieved without intraoperative or postoperative complications. The patient showed resolution of neurological improvement postoperatively. Timely intervention and coordinated multidisciplinary care are essential to achieving favourable maternal and fetal outcomes.

Keywords: Meningioma, Craniotomy, Recurrent seizures

INTRODUCTION

Meningiomas are common benign intracranial tumours arising from the arachanoid cap cells of meninges. They are slow-growing, benign tumours, symptomatic depending upon their location and size. The incidence among women is 3 in 1,00,000, but their occurrence during pregnancy is seen in around 0.1% to 0.5% of all pregnancies.[1,2]

Pregnancy-related hormonal and vascular changes may cause rapid tumour enlargement, leading to symptoms such as headache, seizures, visual disturbances and features of raised intracranial pressure, which can mimic obstetric conditions like pre-eclampsia. Management during pregnancy is challenging and requires a multidisciplinary approach balancing maternal neurological status and fetal well-being.

Although conservative management may be possible in stable patients, urgent neurosurgical intervention is required in cases of neurological deterioration or significant mass effect.

CASE REPORT

A second gravida in her 20s with one living child presented at 33+3 weeks of gestation with three seizure episodes (tonic clonic seziure) associated with vomiting. There was no history of loss of consciousness, trauma, or prior neurological illness. There was no history of raised blood pressure records or any other neurological symptom prior to this event. On examination, the patient was conscious and oriented, postictal phase had subsided. Neurological evaluation was unremarkable at this point. Obstetric examination was unremarkable, and fetal ultrasonography demonstrated normal fetal growth and cardiac activity. Magnetic resonance imaging was ordered to reach a diagnosis. Magnetic resonance imaging of the brain revealed a well-defined extra-axial lesion along the anterior falx in right frontal paramedian location with mild oedema in underlying white matter with mild mass effect suggestive of meningioma as shown in Figure 1. A multidisciplinary team involving neurosurgery, obstetrics, anaesthesiology, and neonatology was gathered. She was added on injection levetiracetam 500 mg twice a day. Injection dexamethasone was started for fetal lung

maturity. Decision was taken to proceed with surgical excision of tumour along with extraction of fetus considering patient had recurrent seizure episodes. Patient was taken up for caesarean delivery where she delivered a healthy male child weighing 1916 grams with APGAR of 8, 9. In the same sitting right frontal craniotomy with Simpson grade II excision was performed.

Histopathology showed cellular tumour arranged in large nests, cords and islands with large areas of whoring. These tumour cells were also arranged in syncytium showing mild nuclear pleomorphism, vesicular chromatin, inconspicuous nucleoli and moderate amount of cytoplasm. Scanty mitosis seen. Areas of psammomatous calcification seen. Features suggestive of meningiothelial meningioma-CNS WHO grade 1. Margins were clear of any tumour cell.

Postoperatively, the patient had no further episodes of seizure or any other neurological symptoms. Follow-up magnetic resonance imaging at six months showed no evidence of residual or recurrent tumour, and both mother and child remained in good health at the six-month follow-up.

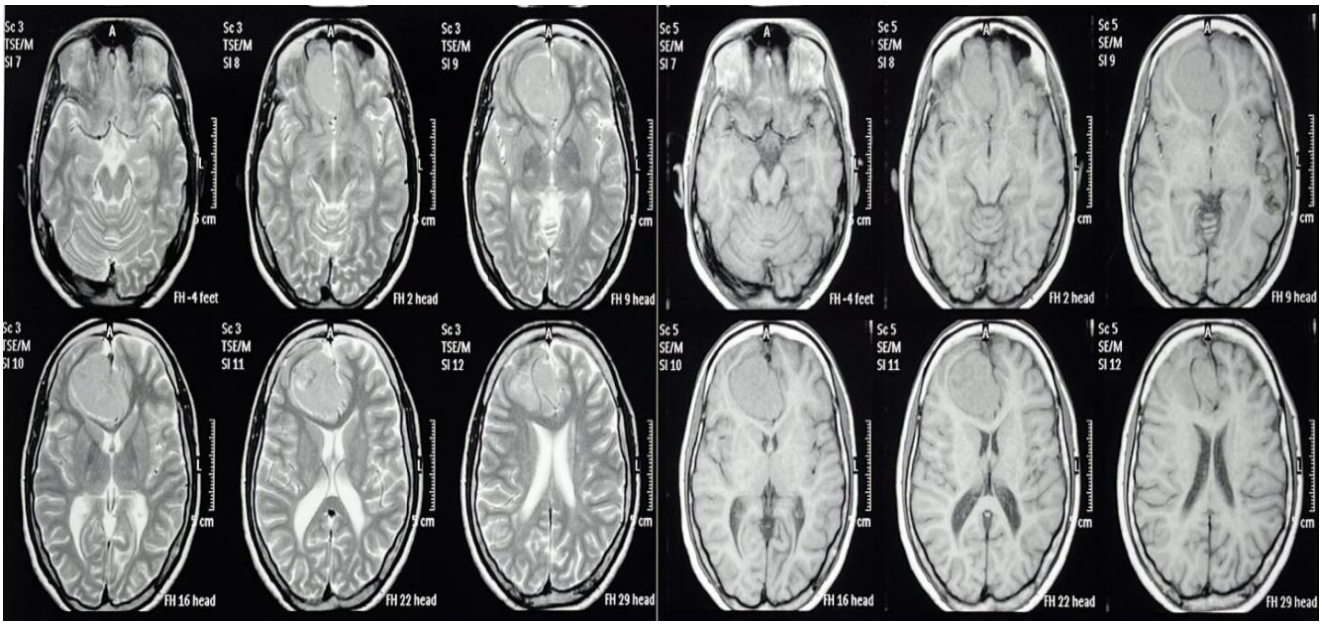

Figure 1: Magnetic resonance imaging of the brain revealed a well-defined extra-axial lesion along the anterior falx in right frontal paramedian location with mild edema in underlying white matter with mild mass effect suggestive of meningioma.

DISCUSSION

Meningioma are benign tumours that comprise about 37.6% of all CNS tumours, twice more commonly seen in females and higher incidence is seen with increasing age (median age of diagnosis being 66 years old).[2] Most cases are sporadic in nature. It has been studied that people with neurofibromatosis-2 gene and exposure to ionizing radiation are at a higher risk.[3]

The effect of pregnancy on meningiomas have debatable evidence with many studies suggesting tumour enlargement owing to pregnancy-related hormonal changes whereas some studies contradict this fact.[4-20] Pregnancy having positive influence on the clinical behaviour of meningiomas is attributed to elevated progesterone and oestrogen levels. Histologically tumour is shown to have 88% progesterone receptors and 40% estrogen receptors, which explains female predominance and increased growth of these tumours in pregnancy.[4] Study done by Roland et al shows no increased risk of meningiomas with use of estrogen or levonorgestrel, however use of desogestral does show increased meningioma risk.[6] Lucy et al described a positive role of anti-progesterone as therapeutic option in unresectable meningiomas.[1]

In addition to hormonal stimulation, other physiological changes in hemodynamics such as increased maternal blood volume, vascular engorgement, and fluid retention may contribute to tumour expansion and peri-tumoural oedema presenting with symptoms or worsening of existing symptoms.[20] Symptoms include with visual disturbances, neurological deficits, olfactory changes, nausea vomiting or cognitive changes.

Common pregnancy-related complaints such as headache, nausea, vomiting, and fatigue may overlap with early manifestations of brain tumours, leading to misattribution of symptoms to normal gestational changes. Our patient had a frontal meningioma but did not present with typical signs of visual disturbances, anosmia, motor weakness or any behavioural change. She presented with seizure episodes.

Brain tumours may be missed or diagnosed late during pregnancy or even diagnosed late in the post-partum period when seizures are the sole presenting symptom. New-onset seizures in pregnant women are frequently presumed to be due to eclampsia. This diagnostic bias can delay appropriate neuroimaging, especially due to concerns about fetal safety and reluctance to perform imaging studies during pregnancy.[21-25]

However, in setting of seizure a radiological imaging adds value to diagnosis for underlying space occupying lesion wherever feasible. Magnetic resonance imaging without gadolinium is the preferred diagnostic modality. Computed tomography is preferred imaging modalities in emergencies as it produces quicker results. However, when these investigations fail to reveal an etiology and clinical suspicion persists, advanced imaging such as magnetic resonance venography should be considered to exclude cerebral venous thrombosis, a potentially life-threatening but treatable condition with increased incidence during pregnancy and the puerperium.

Management should be individualized based on gestational age and neurological status, with conservative treatment favoured when possible, with close neurological and radiological monitoring, reserving surgical intervention for cases with significant neurological compromise or raised intracranial pressure.[23,27,28] In our case, patient had recurrent seizure episodes not managed with standard medical management, with radiology suggesting a space occupying lesion multidisciplinary team was assembled with planned for surgical excision for optimum maternal and fetal outcomes.

CONCLUSION

Seizures in pregnancy in the absence of hypertension should prompt thorough evaluation for alternative neurological causes, with a high index of suspicion for underlying intracranial pathology. Timely diagnosis and coordinated multidisciplinary management are essential to optimize maternal and fetal outcomes.

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