

## CASE REPORT

# Pregnant patients with severe headaches – don't forget brain tumours!

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Although sometimes innocuous, headaches in pregnancy may be associated with serious, even life-threatening conditions, with diagnosis delayed due to nonspecific findings associated with normal pregnancy. Meningiomas are the most common primary tumours, have a strong female predisposition and are mostly benign. There is a paucity of information on the diagnosis and management of meningiomas during and after pregnancy. In this article, we describe two cases of meningioma with differing management, seen within a period of 6 months. In case one, iatrogenic preterm delivery of the baby at 33 weeks' gestation was executed to facilitate vision-saving neurosurgery. In our second case, delivery was at early term, with time allowed for postpartum re-evaluation before definitive neurosurgery.

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Headaches are common in pregnancy, but often receive scant clinical attention. Although sometimes innocuous, headaches may be associated with serious, even life-threatening conditions, with diagnosis delayed due to nonspecific findings associated with normal pregnancy.<sup>[1]</sup> The incidence of brain tumours in pregnancy, although low, includes primary and metastatic tumours.<sup>[2]</sup> The physiological changes of pregnancy may affect tumour growth and neurological symptoms, with common complaints being headache, nausea, visual changes, seizures and sometimes focal cranial nerve deficits.<sup>[1-3]</sup>

Meningiomas are the most common primary tumours, have a strong female predisposition and are mostly benign.<sup>[1]</sup> The diagnosis is mainly via magnetic resonance imaging (MRI) neuroimaging, which is safe in pregnancy and indicated for tumours. Surgery is preferred, but can be delayed until after delivery, provided that the patient remains stable.

However, iatrogenic preterm delivery may be indicated, with caesarean section considered when intracranial pressure is raised. In this article, we describe two cases of meningioma with differing management, seen within a period of 6 months. Both women provided written consent for this article, and ethics approval was granted by Stellenbosch University (ref. no. HEA-2024-30430).

Case one was a 27-year-old, G2P0M1 (gravida two para zero miscarriage one) who presented at 28 weeks' gestation with headache and deteriorating vision in her right eye, leading her to resign from her employment. Her body mass index (BMI) was 36 kg/m<sup>2</sup>, with no associated comorbidities. For the 2 years preceding this pregnancy, she had had headaches and loss of vision in her left eye, and deteriorating vision in her right eye. Although she consulted her public primary clinic, the referral and diagnostic work-up failed owing to the COVID-19 pandemic. At the subspecialist clinic, she underwent multidisciplinary work-up, revealing total optic atrophy in the left eye and a visual field defect in the right eye. Neuroimaging showed a suprasellar mass encasing the left internal carotid artery, bilateral anterior cerebral arteries and left optic nerve. At 33 weeks'

gestation, neurosurgical intervention was deemed urgent to preserve vision in her right eye. A staged approach, with caesarean delivery first and debulking neurosurgery 3 days later, was performed. The neonatal outcome was good, with tumour histology confirmed as World Health Organization (WHO) grade 1 tuberculum sellae meningioma. The patient experienced both immediate and continued improvement of vision in her right eye following surgery.

The second case was a 35-year-old G3P1M1 (gravida three para one miscarriage one) with a normal BMI, who presented to the high-risk clinic at 19 weeks' gestation. She was known to have previous Graves' disease in remission, reporting a 1-year history of persistent, bilateral headaches (progressively worse in pregnancy), and a 2-month history of anosmia and photophobia with no visual loss or vomiting. The multidisciplinary work-up revealed normal visual fields and acuity, but bilateral papilloedema without optic nerve damage. Neuroimaging showed an olfactory groove meningioma (40 × 51 mm) with surrounding vasogenic oedema. Her pituitary hormone profile was normal for pregnancy. After counselling, the combined decision was for expectant management with symptomatic relief and close monitoring. She remained stable, and was delivered by caesarean section, owing to the presence of known raised intracranial pressure, at 38 weeks' gestation.

The postpartum course was complicated by mild-moderate hypertension and generalised tonic-clonic seizures on the second day postpartum. With a diagnosis of post partum eclampsia, MgSO<sub>4</sub> and carbamazepine were administered. No further seizures occurred, and the mother and baby were discharged on day five post partum. At 3 months post partum, the MRI showed a locally aggressive olfactory groove meningioma (48 × 52 × 42 mm) with mass effect on both frontal lobes. The tumour was fully resected via craniotomy, 5 months after delivery, with histology confirming a WHO grade 1 meningioma. She suffered no pituitary insufficiency nor transient diabetes insipidus, and was discharged 10 days later. The follow-up MRI confirmed complete resection. Subsequently, this thankful patient has normal vision and pituitary functions.

Growth, and thereby symptomatology, of meningiomas in pregnancy can be attributed to the endocrine environment and increased perfusion, with expression of progesterone and other hormone receptors.<sup>[1-3]</sup> Differentiating serious pathology from pregnancy-associated complaints can be challenging. While headaches are nonspecific, olfactory groove meningiomas can cause anosmia and visual loss. Management requires an individualised, multidisciplinary approach based on the symptoms, size and location of the tumour, and gestational age. In principle, elective surgery should be performed in the second trimester of pregnancy, or postponed until after delivery.<sup>[3]</sup> In case one, iatrogenic preterm delivery of the baby at 33 weeks' gestation was executed to facilitate vision-saving neurosurgery. In our second case, delivery was at early term, with time allowed for postpartum re-evaluation before definitive neurosurgery. In both cases the raised intracranial pressure informed the decision to deliver the baby by caesarean section.

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