

Dilemmas in Management of Brain Tumours in Pregnancy

Dear Editor,

Brain tumours in pregnancy are rare with an incidence of 15 per 100,000 and previous reports have shown variable outcomes. We present a case of glioblastoma multiforme (GBM) in pregnancy in which the patient underwent emergency craniotomy and adjuvant radiotherapy before delivering a healthy baby with good outcome.

Case Report

Madam W, a 26-year-old healthy Chinese primigravida, presented at 24 weeks' gestation with sudden onset of severe headache associated with left-sided weakness. Physical examination confirmed a Glasgow Coma Scale (GCS) score of 13 and altered level of consciousness, unequal pupils, partial cranial nerve III palsy and left hemiplegia.

Magnetic resonance imaging (MRI) showed a large 7.0-cm right occipitoparietal mixed necrotic and haemorrhagic tumour, likely to be GBM (Fig. 1), which caused significant midline shift and left lateral ventriculomegaly with extension into the corpus callosum.

She was transferred to a tertiary centre for neurosurgery where an obstetric ultrasound showed an appropriately grown fetus. Risks of pre-term labour and complications of extreme prematurity were discussed.

Mdm W's GCS score deteriorated to 3 and she underwent emergency craniotomy for evacuation of clot and debulking of the tumour. Postoperatively, the patient was disoriented with left hemiplegia. Histology confirmed GBM (WHO grade IV) and postoperative magnetic resonance imaging (MRI) showed a 5.5-cm residual tumour.

The diagnosis, treatment options and prognosis of GBM were discussed with multi-disciplinary inputs from the neurologist, neurosurgeon, obstetrician, medical oncologist and therapeutic radiologist. The patient and her family declined the option of premature delivery for chemotherapy and opted for daily radiotherapy for 6 weeks with a view to prolonging the pregnancy.

Upon discharge 2 months later, Mdm W was able to move all 4 limbs albeit with some residual left hemiplegia. She went on to deliver a healthy male baby at 36 weeks' gestation via elective lower segment caesarean section (LSCS) with a birthweight of 2390 g and good Apgar scores.

Mdm W was last seen 10 months post-craniectomy and remained well with good power in all 4 limbs and mild dysarthria. She had returned to work as a factory operator and was on regular follow-up.

Discussion

Brain tumours in pregnancy are relatively rare with an incidence of 15 per 100,000. In a population-based study,¹ the rates of intracranial neoplasia for women of child-bearing age (15 to 44 years) was less than expected compared to that in the general population with an observed to expected ratio of 0.38.

Approximately 75% of cases of intracranial tumours occurring in women of reproductive age presented during pregnancy. This may be explained by an enlargement of the tumour due to fluid retention and accumulation as a result of hormonal changes, vascular engorgement,² and hormone-related tumour growth, demonstrated by progression of neurologic symptoms during pregnancy and remission postpartum.²

Brain tumours in pregnancy can present with a myriad of symptoms and signs ranging from mild to severe. Common presenting symptoms include generalised symptoms such as headache, nausea and vomiting, seizures, syncope and cognitive dysfunction which mimic those of pre-eclampsia and eclampsia and hence may result in difficulty or delay in diagnosis. Common focal symptoms include visual, language, motor and sensory disturbances.

Factors that have to be considered when deciding the most appropriate management include the severity and rate of

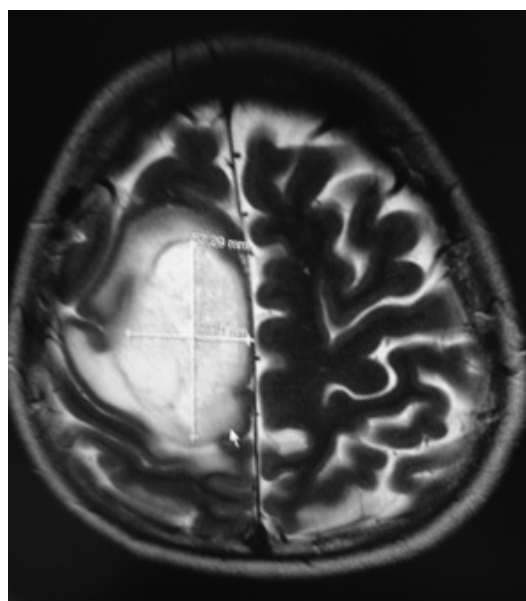


Fig. 1. MRI brain showing a large 7.0-cm right occipitoparietal mixed necrotic and haemorrhagic tumour, likely to be glioblastoma multiforme .

progression of symptoms, gestational age and location and size of the tumour. A multi-disciplinary approach is clearly indicated with comprehensive discussion of the risks with patients and their families. Pharmacological interventions³ include corticosteroids to reduce intracranial oedema and accelerate fetal lung maturity and anti-epileptics to control maternal seizures or for prophylaxis. Other forms of treatment include surgical resection, radiation therapy and chemotherapy.³

A patient who presents during the first or early second trimesters may be considered for neurosurgery as the fetus is remote from viability. Radiotherapy, radiosurgery and image-guided surgery may also be an option after the first trimester.⁴ Benefits of anti-epileptic medications to control maternal symptoms outweigh their risks of teratogenicity and should not be withheld.⁴

If a patient presents at or near term, delivery may be performed followed by tumour resection. Delivery should preferably be by LSCS under general anaesthesia to reduce the risks of cerebral herniation associated with the down-bearing effects in vaginal delivery and placement of an epidural catheter.

In most of the published literature,^{2,4} majority of women presenting in the late second or early third trimester were managed by tight pharmacological control and close fetal surveillance. LSCS was done, performed only when there was acute neurologic deterioration or after fetal lung maturity was achieved. Outcomes for these women and their babies were generally good.

In 2000, Tewari et al⁴ presented 8 cases, 6 of whom experienced herniation or acute neurologic decompensation and were delivered by emergency LSCS between 27 and 40 weeks gestation. Of these 6 mothers, 4 died and the remaining 2 have unresectable disease with significant neurological deficits.

An alternative treatment option includes neurosurgical interventions which may be carried out in emergency situations when there is acute neurological deterioration. This form of management reduces the risk of herniation later in pregnancy. However, there may be associated risks of spontaneous abortion or premature births and teratogenicity of radiation. In 1995, Sneed et al⁵ presented 2 cases where craniotomy was performed in women at 26 and 27 weeks' gestation, followed by terbutaline to suppress preterm labour. The patients then received radiotherapy and both delivered healthy babies via spontaneous vaginal delivery near term. One patient remained clinically stable at 31 months, while the other developed a new separate lesion and died 14 months after first presentation. These 2 cases, together with Madam W, showed that initial good outcomes of both mother and baby can be achieved.

Whether a pregnancy should be terminated in this difficult situation depends on several factors. Risks and benefits have to be weighed and treatment individualised. Generally, if a patient presents at a time in pregnancy when fetal lung maturity has not been achieved, but is clinically stable, she should be allowed to continue with the pregnancy under close supervision and pharmacological control of symptoms. All risks and benefits associated with continuation or termination of pregnancy, the different treatment modalities, the natural history of the disease and possible outcomes, must be discussed.

Conclusion

Brain tumours in pregnancy are medical dilemmas with no standard or routine treatment especially when fetal well-being is a consideration. Earlier literature²⁻⁵ has demonstrated contrasting ways of managing such patients with variable maternal and fetal outcomes. The aim of treatment is to minimise both maternal and fetal mortality and morbidity which can be achieved by prolonging pregnancy while alleviating complications from the brain tumour or treatment. The management plan has to be individualised with input from a multi-disciplinary team and the consideration of a multitude of factors, including nature and location of the tumour, associated signs and symptoms, fetal gestation and the patient's wishes.

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