Journal of Medicine and Medical Sciences Vol.1 (2) pp. 029-033 March 2009
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Case Report

Intracranial tumor manifesting in the 2nd week of pregnancy: case report in a 24year old female.

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Accepted 06 March, 2010

The presence of a brain tumor complicating pregnancy is a relatively rare phenomenon. Though several cases have been recorded, there is scanty data describing such an occurrence in Nigeria and particularly cerebellar glioma. Pregnancy often masks the presence of an intracranial neoplasm, and may increase the risk of mis-diagnosis. This is because symptoms such as headache, vomiting, visual disturbance which are signs of raised intracranial pressure, are often encountered in pregnancy with or without pre-eclampsia. A high index of suspicion on the part of the obstetrician is key to timely diagnosis. Although an enhanced brain CT is able to make the diagnosis readily and facilitate further management, MRI is superior in defining the exact relationships of intracranial S.O.L, but may not be readily available in developing countries as in the present circumstance. Diagnostic imaging such as CT scan performed timely, is extremely useful in demonstrating the size, location and relationship of a possible lesion. Furthermore, because it is more widely available than MRI, it is often an invaluable tool in the initial assessment of normo-tensive pregnant patients presenting with features of raised ICP. Once diagnosis is made, the management can be successfully tailored to suit individual patients' need. Despite the challenges posed by non-surgical management of glioma during pregnancy, normal delivery and healthy live birth is still possible.

Keywords: Intracranial tumor, glioma, pregnancy, manifestation, appearances

INTRODUCTION

The presence of a brain tumor complicating pregnancy is a relatively rare phenomenon (Krishna et al 2006; Ducray et al., 2000). Although several cases have been reported, there is scanty data describing such an occurrence world-wide and particularly cerebellar glioma. Gliomas are a heterogeneous group of neoplasms that comprise the majority of tumors originating in the central nervous system (CNS). In adults, the most frequently encountered of these are high-grade or malignant neoplasms of astrocytic and oligodendrocytic lineage, ie, anaplastic astrocytoma (AA), glioblastoma multi-forme (GBM), and anaplastic oligodendroglioma (AO), respectively. Tumors of mixed lineage are also seen,the most common of which is designated anaplastic oligoastrocytoma (AOA) (Burton and Prados, 2000). Low-grade gliomas are uncommon primary brain tumors classified as histologic grades I or II in the World Health Organization (WHO) classification. The most common variants are pilocytic and low-grade astrocytomas, oligodendrogliomas, and mixed oligo-astrocytomas located in the cerebral hemispheres.(Stieber, 2001)

Although there is no increased incidence of brain tumors in pregnancy, the initial manifestation of many of them, especially gliomas, has been found to occur during the first trimester (Kempers and Miller, 1963; Roelvink et al., 1987; Isla et al., 1997; Tewari et al., 2000). It has been noted that pregnancy often masks the presence of an intracranial neoplasm, and that the risk of mis-diagnosis is high (Chauhuri and Wallenburg, 1980). This is because symptoms such as headache, vomiting, visual disturbance are often encountered in pregnancy

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with or without pre-eclampsia. A high index of suspicion on the part of the obstetrician is key to timely diagnosis. We present a rare case of cerebellar glioma with CT appearances in a 24 year old female, with manifestations in the early on- set of pregnancy.

CASE PRESENTATION

Our patient is an unbooked 24 year G2 P1, with a history of 13 weeks amenorrhea. She was hospitalized with complaints of severe headache and vomiting of sudden onset. She had at least 2 episodes of generalized tonic clonic seizures in the two weeks preceding her visit. She was experiencing minor visual but no personality disturbances. She was apparently normal, without any form of complaints prior to pregnancy. Her first child is 18 months old, and the first pregnancy and parturition were uneventful.

On her first presentation in the hospital after four weeks of amenorrhea, she was slightly febrile; otherwise her general condition was good. Laboratory examination revealed blood leukocytes 15,000, blood glucose 142 mg, malaria parasites ++.Her pulse was regular and blood pressure was within normal limits with values 118/70mmHg. She was given intravenous fluids, antimalarials and Paracetamol. The headache and earlier described symptoms persisted despite treatment. A detailed neurological examination revealed minor balance and gait disturbances. There was no evidence of discordination or limb paresis. She was eventually referred for a Brain CT scan to exclude presence of an intracranial space occupying lesion. Following a CT diagnosis of possible cerebellar glioma, patient was consequently managed with external beam therapy, anticonvulsants and adjuvant chemotherapy. Reductive surgery was contemplated, but was not done, due to patient's refusal as well as poor availability of facilities. Moreover, patient also opted to continue with the pregnancy. There was remarkable improvement in patient's condition as well as normal progress of pregnancy. The woman was eventually delivered of a healthy female baby at 35 weeks, with no glioma-related complications or evidence of immediate congenital malformation due to cytotoxic chemotherapy. No biopsy, surgical resection and or histology have been performed till date.

EQUIPMENT AND METHODS

Our machine is a CT/e single slice helical scanner manufactured by GE (General Electric), USA.

An enhanced brain CT scan was performed with 3mm slices in the posterior fossa and 7mm contigous slices for the rest of the brain. Consent was sought from the Ethics and Research Committee of Image Diagnostics, for reproduction of CT images and access to patient's data and radiological report.

RESULTS

Contigous slices showed a relatively large mass in the left cerebellar hemisphere which measures about 5.2 x 6.5cm. Mass has both solid and cystic components. It also shows some tiny calcifications and mild peripheral enhancement. There is compression and displacement to the right of the 4^{th} ventricle; consequently there is dilatation of the rest of the ventricular system – obstructive hydrocephalus. There is a mild hazy hypodensity surrounding the lateral ventricular horns suggesting transependymal ecchymosis of ventricular fluid as a consequence of raised intraventricular pressure. No hypereostosis of adjacent bones and or evidence of bony erosion.

These are illustrated in the figures 1 and 2 below.

DISCUSSION

The incidence of gliomas is increasing worldwide, including India. Of the 18,820 new cases of primary central nervous system (CNS) tumors diagnosed annually in the United States, gliomas account for over 60% with 30-40% of them being glioblastoma multiforme (GBM), 10% being anaplastic astrocytoma (AA), and 10% being low grade gliomas (LGGs).

This is in contrast to one study from West Bengal, India, in which only 7.9% of the brain tumors were GBMs, while 46.8% were astrocytomas. Of all adult primary CNS tumors, GBM is the most common and the most malignant with about 7,000 to 8,000 new cases annually in the United States (Khan et al., 2009).

900 to 1000 new cases of primary brain tumour occur each year in Denmark, and half of them are gliomas (Poulsen, 2006).

Brain tumor and in particular glioma is a comparatively rare complication of pregnancy. (Krishna et al 2006; Krishnansu et al., 2000; Ducray et al., 2006)

Symptoms of intracranial lesions associated with pregnancy include intracranial hypertension, neurologic signs, haemorhagic lesion and focal seizures (Isla et al., 1997).

These would manifest with headaches, vomiting, convulsions, visual disturbance (Krishna et al., 2006) and could pose a diagnostic dilemma since normal patients could exhibit similar symptoms with or without pre-eclampsia (Chaudhuri and Wallenburg, 1980).

A high index of suspicion is a key to earlier diagnosis. In our case, the persistence of symptoms, the age of patient and her normo-tensive status, were key indices for suspicion, necessitating request for diagnostic imaging.

There are variations in the course of intracranial lesions during pregnancy, with reports ranging from indolence to severe neurological crises.

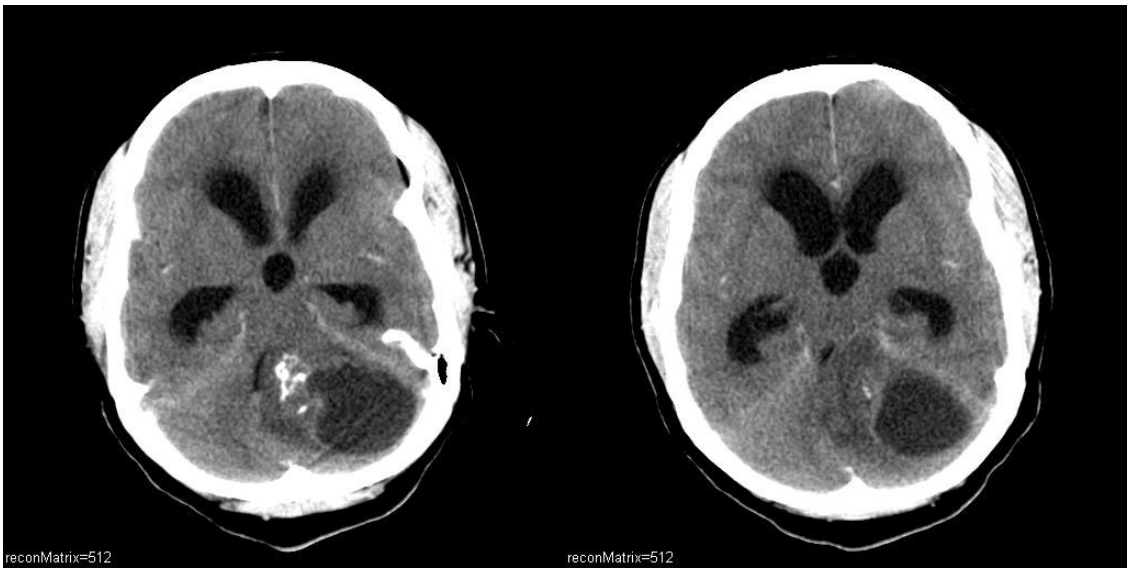

Figure 1. Left cerebellar mass with areas of mixed density and compromised 4th ventricle.

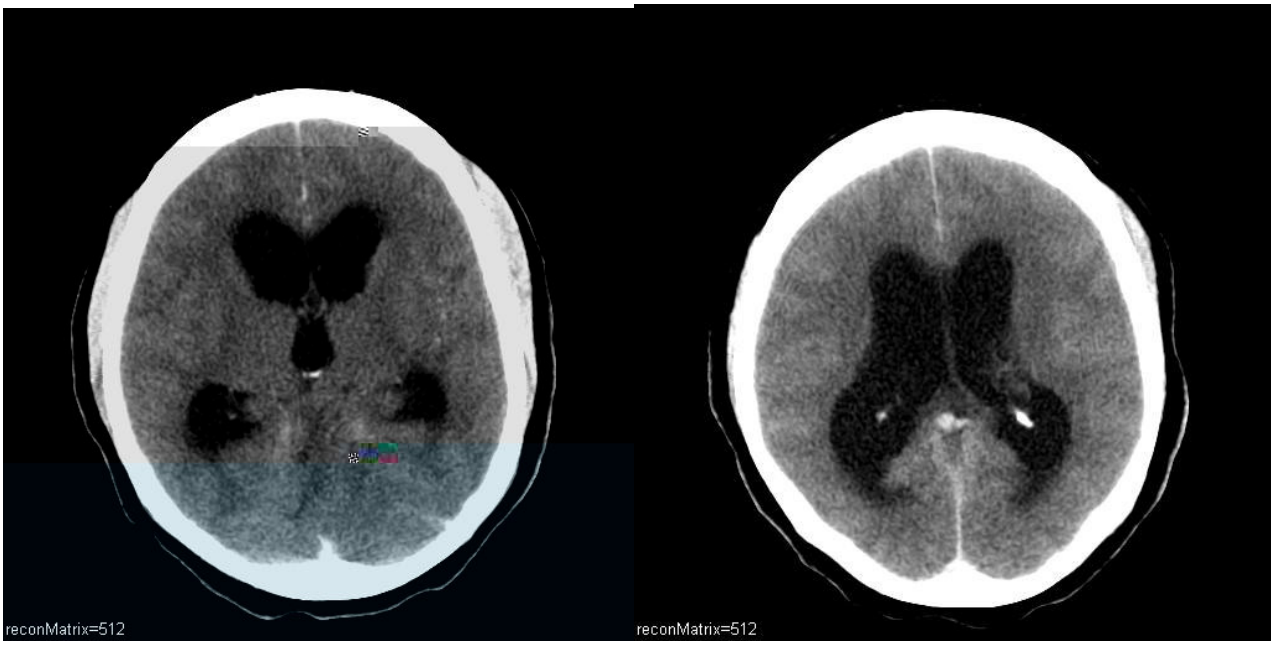

Figure 2. Evidence of obstructive hydrocephalus due to compression of 4th ventricle

The severity of symptoms appear to increase within the second and third trimesters (Krishna et al., 2006; Krishnansu et al., 2000).

In the foregoing case, severe symptoms not only manifested in the first trimester, but within the fifth week of pregnancy.

Literature has suggested that severity of symptoms may be related to the increased presence of brain edema as well as growth in the size of tumor. (Krishna et al 2006)

It has been shown that pregnancy alone predisposes the brain to edema formation by up-regulation of a type of channel forming trans-membrane protein called Aquaporin-4 (AQP4).This protein facilitates the movement of water, glycerol and other solutes across plasma membrane. The likelihood of blood-brain barrier disrupti-

on in the presence of neoplasm, further increases the likelihood of edema formation and could become worsened if eclampsia is present.(Allison and Cipolla, 2005; Ishiboshi et al., 2000; Agre et al., 1998; Verkman, 2002)

There was however, no obvious cerebral oedema as may be expected in this case. The early manifestation of symptoms in this patient is attributed mainly to rapid increase in the size of the mass. Once a diagnosis has been made, the specific method of intervention is tailored to suit individual patients. Edema and vasogenic effects are typically managed with corticosteroids. Dexamethasone is given at an initial dosage of 4mg given four times daily. Anticonvulsants are given prophylactically after resection and for patients who present with seizures (Stieber, 2001). Given poor outcomes, a number of treatment approaches have been investtigated. Common to these approaches is the use of adjuvant radiation therapy, even as surgery alone, with or without chemotherapy, may be the mainstay for some lower grade and low-risk gliomas. Today, treatment typically involves external beam radiation, with concurrent and adjuvant chemotherapy for more aggressive histologies (Khan et al., 2009).

Surgery is required for a definitive histopathologic diagnosis, which in turn will dictate subsequent therapy options. Moreover, aggressive tumor resection improves survival outcomes, and in many cases, the patient's neurologic function. Burton and Prados (2000), generally advocate the safest, maximal resection attainable for patients with these tumors as a way to improve prognosis. In almost all cases, surgery should be followed by radiation therapy. Postsurgical irradiation is the most effective treatment currently available for improving survival. There is also mounting evidence to suggest that additional radiation, given in the form of brachytherapy or radiosurgery, at initial diagnosis as a "boost" to standard radiation or at tumor recurrence, may provide added improvement in survival outcome. Radiosurgery and brachytherapy are therapies often used to treat eligible patients in some institutions (Burton and Prados, 2000).Adjuvant chemotherapy, conventionally given after radiation, may offer a modest survival benefit in some patients with GBM. Bischloro-ethylnitrosourea (BCNU) is the typical first-line agent used, but chemotherapy seems to be most beneficial in young patients, with little if any impact on survival for patients over 60 years old. At this institution, we often defer treatment with adjuvant chemotherapy for elderly patients with GBM due to lack of efficacy and the attendant risk with chemotherapy. For anaplastic astro-cytomas, oligodendrogliomas, and oligoastrocytomas, a commonly accepted standard is adjuvant chemotherapy following irradiation with the three-drug regimen-pro-carbazine, CCNU, and vincristine (PCV). This is due to an earlier clinical trial that showed a survival advantage in patients treated with adjuvant PCV compared with patients that received BCNU. However, recent data suggest that treatment with either PCV or BCNU may be appropriate. Both regimens now appear to have equal efficacy for anaplastic gliomas in light of a more recent analysis done with larger numbers of patients (Burton and Prados, 2000)

In general, most pregnancies would be allowed to continue under close monitoring until the baby is delivered. Neuro-surgical intervention is best deferred until after delivery. Interruption of pregnancy is indicated only if the mother's life or vision is compromised. If symptoms present during the 3rd trimester, elective caesarian section with patient under general anesthesia is carried out, to minimize temporal lobe or cerebellar herniation in unstable patients. (Krishna et al., 2006; Chaudhuri and Wallenburg, 1980; Krishnansu et al., 2000). Ducray et al., (2006) recommended that the management of gliomas diagnosed during pregnancy should not be different from the standard management of gliomas in young non-pregnant adults. Pregnant women because of their young age can have a long survival. Their pregnancy should not prevent them from receiving the best treatment for their glioma. Treatment will depend upon clinico-radiological presentation, histology, gestational age and the patient's desires. Generally speaking, surgical resection of high-grade gliomas should not be delayed during pregnancy.Progress in anesthesia and neurosurgery have greatly reduced the risks for the foetus. After delivery, if the delay between surgery and delivery is too long it is possible to begin cerebral radiotherapy during pregnancy. After the first trimester of gestation this treatment can be given without any important risks for the child. This recommendation was aptly followed in the management of our case with remarkable positive outcomes.

Conclusion

In conclusion, gliomas such as we diagnosed, make up 40% of all brain tumors, and have been found to make their initial manifestation during the first trimester presumably due to tumor enlargement resulting from acelerated growth and/or intracellular fluid retention (Isla et al 1997; Roevink et al 1987).

Hormonal factors have been implicated to play a causative role in this phenomenon (Kempers and Miller, 1963; Isla et al., 1997; Roevink et al., 1987).

A high index of suspicion is key to an early referral for diagnostic imaging. Early diagnosis and precise localization of the tumor are of utmost importance since management has to be individually tailored in each case (Kempers and Miller, 1963; Isla et al., 1997; Roevink et al., 1987; Tewari et al., 2000).

Diagnostic imaging such as CT scan performed at this time is extremely useful in demonstrating the size, location and relationship of a possible lesion. Furthermore, because it is more widely available than MRI in the developing countries, it is proved to be a valuable tool in the initial assessment of normo-tensive pregnant

patients presenting with features of raised ICP.

Finally, our case further confirms earlier assertions by Blumenthal et al. (2008) ,that though management of malignant glioma during pregnancy is challenging, normal delivery and healthy live birth is possible

ACKNOWLEDGEMENT

We are grateful to the Research and Human Ethics committee of Image Diagnostics for permission to reproduce the CT images and radiologic report.

REFERENCES

Agre P, BonHivers M, Borgnia MJ(1998). The aquaporins blueprints for cellular plumbing systems. J. Biol Chem. 273:14659-14662

Allison M Q,Cipolla JM(2005). Pregnancy-induced up-regulation of aquaporin-4 protein in brain and it's role in eclampsia.The FASEB J. 19:170-75

Blumenthal DT, Parreño MG, Batten J, Chamberlain MC(2008). Management of malignant gliomas during pregnancy: a case series.Cancer. 15;113(12):3349-54.

Burton EC, Prados MD(2000).Malignant gliomas. Curr. Treat. Options Oncol. 1(5):459-68

Chaudhuri P,Wallenburg HC(1980). Brain Tumors and pregnancy. Presentation of a case and a review of the literature. Eur. J. Obstet. Gynecol.Reprod.Biol. 11(2):109-114

Ducray F, Colin P, Cartalat-Carel S, Pelissou-Guyotat I, Mahla K, Audra P, Gaucherand P, Honnorat J, Trouillas P(2006). Management of malignant gliomas diagnosed during pregnancy Rev.Neurol. 162(3):322-9.

Ishiboshi K, Kuwahara M, Saraki S(2000). Molecular biology of aquaporins. Rev.Physiol.Biochem.Pharmacol.141:1-32

Isla A, Alvarez F, Gonzalez A, Garcia-Grande A, Perez-Alvarez M, Garcia-Blazque S(1997):.Brain tumor and pregnancy. Obstet Gynecol 89(1):19-23.

Kempers RD, Miller RH(1963). Management of pregnancy associated with brain tumors. Am. J. Obstet. Gynecol.87: 858-864.

Khan MK, Hunter GK, Vogelbaum M, Suh JH, Chao ST(2009).Evidence-based adjuvant therapy for gliomas: current concepts and newer developments.Indian J.Cancer. 46(2):96-107.

Krishna D, Rashmi S, Damyanti S, Daya S, Seema M(2006). Glioma in pregnancy. J. Gynecol.Surg. 21(4):177-80

Krishnansu S T, Fabio C, Tamerou A, Bruce LF, Sidney EC, Philip JD, Edward JQ(2000). Obstetric emergencies precipitated by malignant brain tumors. Am.J.Obstet.Gynecol.182(5):1215-21

Poulsen HS(2006). Gliomas in adults: primary non-surgical treatment' 20;168(47):4082-5.

Roelvink NCA, Kamphorst W, Van Alphen HAM, Rao BR(1987) Pregnancy-related primary brain and spinal tumors.Arch.Neurol.44: 209-215.

Stieber VW(2001).Low-grade gliomas. Curr. Treat .Options Oncol. 2(6):495-506.

Tewari KS, Cappuccini F, Asrat T (2000). Obstetric emergencies precipitated by malignant brain tumors. Am.J. Obstet. Gynecol. 182: 1215-21.

Verkman AS (2002). Aquaporin water channels, endothelial cell function. J. Anat. 200:617-627