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## Brain Tumor Revealed by Nausea and Vomiting of Pregnancy- A Case Report



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### ABSTRACT

Pregnant women are susceptible to any of the medical and surgical disorders that can affect childbearing-aged women. Some of these, especially those that are chronic, more often precede pregnancy. A 26-year-old patient with no significant medical history to mention, primigravida, was admitted to our department for nausea and vomiting of pregnancy, accompanied by ketonuria at the 14<sup>th</sup> week of gestation. The diagnosis of a brain tumor during pregnancy is highly problematic and may be easily missed especially when a bewildering range of differential diagnoses exist. Therefore, such an entity should always be borne in mind. Recent advances in imaging modalities such as MRI, neurosurgical techniques and anesthesia seem to improve the odds of both diagnosing and treating the patients considerably. As a consequence, vaginal route of delivery may be more possible. This may also shed some light on the prenatal diagnosis of such tumors and the role of care providers.



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## INTRODUCTION

Pregnant women are susceptible to any of the medical and surgical disorders that can affect childbearing-aged women. Some of these, especially those that are chronic, more often precede pregnancy. But, they as well as others can acutely complicate an otherwise normal pregnancy. The management of these disorders during pregnancy may differ.

Some women will have new-onset neurological symptoms during pregnancy, and these frequently must be distinguished from other pregnancy complications.

The diagnosis of a cancer during pregnancy seems to be rarely encountered. Little research on this association has been conducted. The paucity of data in the literature regarding the brain tumors during pregnancy may make it difficult to report their incidence. Therein, lie multiple epidemiological, onco-biological, diagnostic and therapeutic dilemmas.

## OBSERVATION

A 26-year-old patient with no significant medical history to mention, primigravida, was admitted to our department for nausea and vomiting of pregnancy, accompanied by ketonuria at the 14<sup>th</sup> week of gestation. The physical and neurological examination were within normal limits and no laboratory abnormalities were diagnosed. Obstetrical ultrasound examination showed a twin pregnancy. The patient was treated according to the protocols (Vitamins and adjunctive therapies like acid-reducing agents) and discharged after six days, with making full recovery. The patient consulted again our emergency department for headaches and vomiting at the 22<sup>nd</sup> week of gestation. The physical examination showed a conscious and co-operating patient with a full Glasgow score of 15 with a normal neurological examination (meningeal signs were absent), a stable hemodynamic status, and the absence of dehydration signs except diminished skin turgor. Blood tests were run. Hypochromic microcytic anemia with high ferritin levels were noted. Other laboratory tests (electrolyte balance, liver enzymes, renal functions, vit-B1 levels, etc.) were within normal limits.

On the 2<sup>nd</sup> day of hospitalization, the patient was still complaining of severe headache with persistent vomiting, followed by progressive deterioration of neurological status with temporal spatial disorientation followed by anisocoria and rapidly after that by a coma with a Glasgow score of 6. The patient was promptly managed by the anesthesia/resuscitation team and intubated. Emergency cerebral magnetic resonance imaging (MRI) showed an extensive

temporo- parietal tumor of 8 cm with diffuse cerebral edema. The patient underwent an extensive tumor resection but it was incomplete. She received an antiepileptic treatment. The histopathological examination showed a grade-4 Glioblastoma. Because of the need for radio-adjuvant therapy, the termination of the pregnancy was discussed with the patient who refused this medical advice. During the subsequent follow-up visits, she did not present any particular complaint and the delivery was scheduled by caesarean section at the 34<sup>th</sup> week of gestation. Postpartum, the patient was referred to another center for adjuvant chemotherapy.

## DISCUSSION

The incidence of cancer during pregnancy is estimated at about 1/1000, with mainly gynecological cancers (cervix, breast and ovary), lymphomas, melanomas, brain tumors and leukemia. Although the occurrence of pregnancy in a patient with a brain tumor, or the newly-diagnosed brain tumor during pregnancy are two rare entities, the problems posed by these conditions appear to be multiple and difficult.

The study of the few cases reported in the literature may allow us to draw the conclusion that even if the incidence of this association is underestimated, it is still rare (1). A research in the Medline database allowed us to find two series and some clinical cases. In 1960, Tarnow collected 97 cases (2). Kempers and Miller reported 16 cases from 1950 to 1963 at Mayo Clinic (2). In 1965, Toakley found six brain tumors in 13,000 women who had given birth in the previous four years (2). In 1974, Carmel estimated that about 200 cases had been published in the literature (4). In 1978, Faguer et al reported 10 pregnant women with a brain tumor out of 10,710 who gave birth from 1970 to 1977, i.e. 0.9% (2). In 1984, Haas et al. reported 10 cases registered in the National Cancer Registry for 359 cancers diagnosed in pregnant women, out of more than 2 million births. The total number of brain tumors was 26 (2). In 1997, Isla et al. published seven cases of brain tumors out of 126,413 pregnancies between 1983 and 1995, which could be compared to the general prevalence of tumors of the nervous system from 5 to 8/100 000, of all histology types (2).

Given the low incidence of this clinical presentation, it would not be surprising to note the absence of established data on the time course of a pregnancy with an already existing tumor, whether quiescent or not (3). It seems that pregnancy itself has no role in the neogenesis of a primary brain tumor. Indeed, the relative risk of the different reported histological varieties of tumors, excluding the metastases of trophoblastic tumors, appears to remain the same as

among women of the same age group, whether or not there is an evolving pregnancy(2). On the other hand, all the authors agree on the role of the pregnancy on the brain tumor growth. It is recognized that sex hormones can enhance the growth of certain brain tumors (2, 3, 4). Some initially quiescent tumors may become symptomatic during pregnancy (5) mainly in the second and third trimesters. The regression, sometimes complete, of these symptoms, may occur shortly after delivery. In case of inoperable lesions, the reoccurrence of symptoms in subsequent pregnancies has also been reported (5). The mechanism of these symptomatic manifestations associated with pregnancy is not fully understood. The most accepted hypotheses are the acceleration of tumor growth, increased levels of growth factors and angiogenic factors during pregnancy, and the altered maternal immune tolerance. Our patient presented vague headaches which intensified and worsened at the beginning of the second trimester. All types of tumors can be encountered. However, Tarnow and many other authors have considered the existence of a malignant tumor or an infra-tentorial tumor as a poor prognostic factor because of the risk of accelerated development of intracranial hypertension, particularly the malignant Gliomas as is the case of our patient (5,6).

Brain tumor symptoms can be manifested clinically by three mechanisms: symptoms related to tumor volume-induced intracranial hypertension and peri-lesional edema, epileptic seizures because of focal neurological deficit, or by a general asthenia (2,5). Hence, the diagnostic problem that a pregnancy at its onset may have one or more of these symptoms (7) and therefore the diagnosis of an intracranial tumor may occasionally be delayed.

For the diagnosis, MRI is the imaging examination of choice in cerebral tumor pathology and is perfectly feasible during pregnancy (8). Cerebral computed tomography (CT) can also be performed in pregnant women, with abdomino-pelvic protection by lead apron.

The occurrence of cancer during a pregnancy is a difficult event for oncologists and obstetricians. Many diagnostic and therapeutic procedures usually proposed seem inapplicable. Some evidence-based therapies can be proposed only at the expense of the pregnancy or the risks of serious fetal complications. As a result, this can lead to delays in maternal care and it is unacceptable as far as the management concerns.

In theory, the therapeutic indications for brain tumors are the same as those posed outside pregnancy. Advances in neurosurgery and anesthesia make neurosurgical interventions more

feasible regardless of the age of pregnancy and without adverse effects on its progression or on the fetus (9, 10).

The indications of interventions will be provided by the location of the tumor and its histological type that is suggested by the MRI.

The trend is to defer neurosurgery to the postpartum period if possible, or at least to when the fetus is viable (24 weeks).

Malignant Gliomas and most subtemporal tumors must undergo surgery during pregnancy because of a high risk of cerebral herniation (5, 6, 11, 12).

Overall, indications of therapeutic termination of pregnancy appear to be rare. It could be proposed in case of malignant tumor discovered in the first trimester (especially if it is considered inoperable), new onset of intracranial hypertension in the first trimester, or in a state of prolonged or repetitive distress (2).

Although uterine contractions during labor do not affect CSF pressure, and therefore intracranial pressure, the latter is increased by contractions of skeletal muscles in response to pain and agitation. It is also increased by the expulsive efforts of the second stage of the labor. For all these reasons, whenever possible, spontaneous delivery will be by normal routes, and forceps applied on to engaged head to avoid expulsive efforts, with epidural regional anesthesia at level T 10 (10). The indications of caesarean section remains obstetrical. In the case we presented, we wanted to assess how the diagnosis brain tumors may be delayed. As far as our patient is concerned, earlier suggestive symptoms developed but were thought to be of more etiologies, and the final diagnosis was made when the patient suffered from a critically life-threatening condition. In addition, taking into account the preserved prognosis of the tumor, we advocated the termination of the pregnancy.

## **CONCLUSION**

The diagnosis of a brain tumor during pregnancy is highly problematic and may be easily missed especially when a bewildering range of differential diagnoses exist. Therefore, such an entity should always be borne in mind. Recent advances in imaging modalities such as MRI, neurosurgical techniques and anesthesia seem to improve the odds of both diagnosing and treating the patients considerably. As a consequence, vaginal route of delivery may be

more possible. This may also shed some light on the prenatal diagnosis of such tumors and the role of care providers.

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