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Case Report

Third ventricular colloid cyst causing acute hydrocephalus during early pregnancy: Clinical lessons from a case

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ABSTRACT

Background: Colloid cysts of third ventricle are rare lesions which may present with symptoms of acute hydrocephalus. We report a case of acute obstructive hydrocephalus secondary to third ventricular colloid cyst and its management during 1st trimester pregnancy.

Case Description: A 31-years-old lady presented to the emergency department with reduced consciousness. Computed tomography head showed obstructive hydrocephalus and an obstructing lesion near foramen of Monro suggestive of third ventricle colloid cyst. She underwent endoscopic resection of colloid cyst. Her pregnancy was only confirmed after surgery and she delivered a healthy neonate at full term. She has remained clinically well and had resumed her work as a general practitioner.

Conclusion: This case illustrates that urinary pregnancy test may show false negative result but pregnancy should not preclude radiological investigation and neurosurgical intervention in patients with deteriorating neurological function.

Keywords: Colloid cysts, Neurosurgery, Pregnancy

INTRODUCTION

Colloid cysts are rare benign lesions which usually develop in the roof of third ventricle near the foramen of Monro. They account for approximately 1–2% of all intracranial tumors with incidence of 3.2 per million/year.[2] These lesions may be found incidentally in asymptomatic patients, but most of the symptomatic patients present with symptoms of hydrocephalus including headache, nausea, vomiting, or even sudden deterioration caused by acute obstructive hydrocephalus secondary to obstruction at foramen of Monro.

CASE HISTORY

A 31-year-old general practitioner (GP) presented with 3 days history of posterior headache without any associated symptoms. She developed fever, started vomiting, and became drowsy 2 days later. She was given a dose of ceftriaxone 1 g intramuscularly by out-of-hours general

practitioner, but her condition continued to deteriorate, so she was brought in to hospital by ambulance.

She did not have significant past medical history, no regular medications and not known to have family history of health conditions. She had minimal alcohol consumption, not smoking, and not taking recreational drugs. Her Mirena coil was removed 2 months prior to admission. Urinary pregnancy test on admission was negative.

On examination, she scored 11 (E3 V2 M6) on Glasgow Coma Scale (GCS) upon arrival at emergency department. She was photophobic and had bilateral feet clonus. Pupils were 3 mm, equal and reactive to light. She was not compliant to cranial nerve examination, but no facial asymmetry was observed.

An urgent computed tomography (CT) head was performed, which showed acute hydrocephalus affecting lateral ventricles with transependymal flow and sulcal effacement, crowding of foramen magnum, and partially effaced suprasellar cistern consistent with uncal herniation. A 14 × 14 × 12 mm obstructing lesion was seen at the foramen of Monro, extending more to the left ventricle [Figure 1]. She had emergency insertion of bilateral ventricular drains followed by endoscopic excision of third ventricular colloid cyst 4 days later. No intraoperative complications were encountered.

Her postoperative magnetic resonance imaging (MRI) with Gadolinium showed complete resection of the colloid cyst and resolution of hydrocephalus [Figure 2]. She had significant memory difficulties postoperatively, mainly affecting verbal memory recall. She was discharged home after 18 days of admission with community rehabilitation and phased return to work.

She discovered that she was pregnant following discharge from hospital with the conception happening before her surgery. She was estimated to be 4 weeks pregnant when she was admitted to hospital based on her booking ultrasound scan. She had an otherwise uncomplicated antenatal course. Her child was delivered through elective cesarean section at 39 weeks gestation due to breech presentation. He is developing normally with no medical concerns.

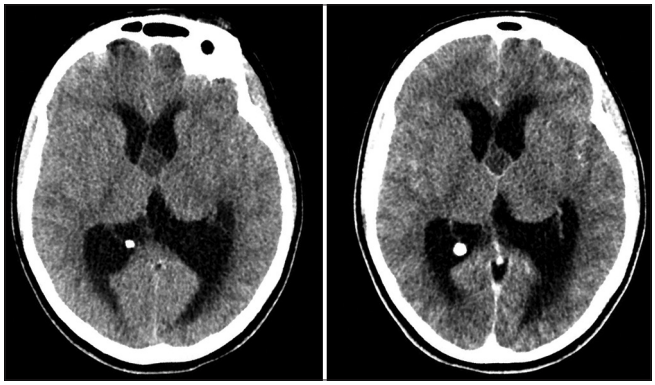

Figure 1: Preoperative computed tomography images showing acute hydrocephalus pre-contrast (left) and post-contrast (right) in axial view.

DISCUSSION

Colloid cysts of third ventricle are slow-growing benign tumors which usually become symptomatic between 20 and 50-year-old. It is a rare cause of sudden neurological deterioration and death. Beaumont *et al*. found that approximately 12% of symptomatic patients and 5% of all patients with colloid cyst are at risk of developing acute hydrocephalus, with a risk of death of 3.1% in symptomatic patients with colloid cyst.[2] Studies have shown that almost all patients who developed acute hydrocephalus had at least 24 h of preceding symptoms and clinical deterioration[2] except in cases of "cyst apoplexy" when acute hemorrhage in cyst causes rapid enlargement of the lesion.[4]

Clinically sensitive urinary pregnancy test can detect pregnancy up to 4 days before expected menstruation. However, false negative may occur when there is insufficient human chorionic gonadotropin (hCG) in the urine, which can happen if the urine is dilute. In contrary, high levels of beta-core fragment human chorionic gonadotropin (βcf-hCG) may also lead to false negative by "hook effect." This occurs when βcf-hCG saturates the antibodies in the testing essay which prevents the pairing of antibodies to form the antibody sandwich.[8] Time from ovulation to implantation may also be later than usual by up to 6 days,[7] which may delay the rise in hCG leading to false negative result.

CT is the most suitable imaging modality for rapid diagnosis of neurological conditions in pregnancy, while noncontrast MRI has not been shown to cause adverse effect on fetus or early childhood.[5] Gadolinium, a contrast agent used to enhance MRI, may cross the placenta and accumulate in amniotic fluid and fetal tissue. Exposure to it at any time during pregnancy is linked to slightly higher risk of stillbirth and death, but the association is not observed when the exposure only happened in 1st trimester. However, 1st trimester exposure to gadolinium-based contrast is shown to increase risk of developing rheumatological, inflammatory, or infiltrative skin conditions during childhood.[3]

Concerns may arise regarding anesthesia exposure in developing fetus as malformations are most likely to occur following exposure to teratogens between days 13 and 60 in embryos. Studies have not shown definite evidence of increased risk of congenital malformations following exposure to anesthetic medications during pregnancy, but many studies found an increased risk of preterm delivery and miscarriages. However, the increased risk of miscarriage is

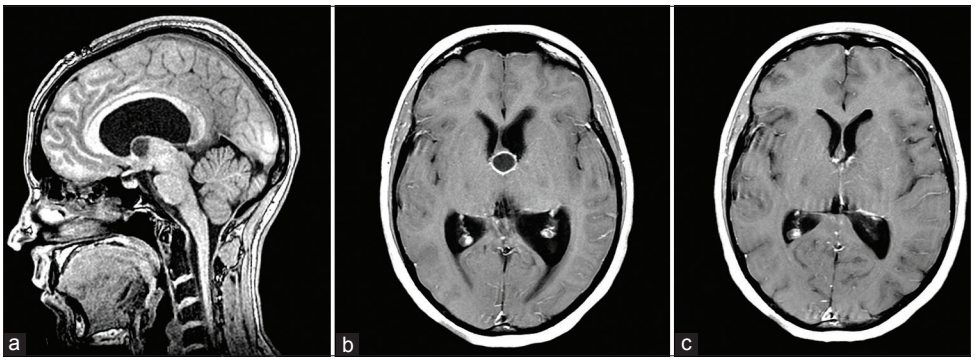

Figure 2: Preoperative T1-weighted magnetic resonance imaging (MRI) in sagittal view (a) and axial view post-Gadolinium (b) showing the third ventricular colloid cyst. Postoperative T1-weighted MRI in axial view post-Gadolinium (c) showing complete resection of the colloid cyst.

thought to be more likely a result of underlying condition, leading to surgery and the surgical manipulation instead of the anesthesia.[1]

While there is no strong evidence to guide management of intracranial tumor during pregnancy, authors of some studies have suggested that 2nd trimester is the ideal time for surgery if it is indicated due to lower risk of intraoperative hemorrhage compared to surgery during 3rd trimester, and the fetus is less vulnerable than 1st trimester. However, urgent surgical intervention is indicated regardless of gestation period when patient is unstable with signs of intracranial hypertension or changes in mental state.[6]

CONCLUSION

This case illustrates that urinary pregnancy test may produce false negative result in early first trimester pregnancy but decision to perform radiological investigation and neurosurgical intervention in patients with deteriorating neurological function should not be precluded by pregnancy status and gestation age. Neurosurgical treatment of colloid cyst is safe and effective and can be considered a primary treatment option in patients harboring colloid cysts with moderate to large size ventricles.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

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