



ANAESTHETIC MANAGEMENT OF RUPTURED INTRA-CRANIAL ANEURYSM DURING EARLY PREGNANCY – A CASE REPORT

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ABSTRACT Subarachnoid hemorrhage (SAH) in pregnancy is devastating for both mother and the baby. SAH due to aneurysm, arterio-venous malformation or any other vascular malformation is a grave complication in pregnancy. Headache is very challenging symptom in pregnancy with raised intracranial pressure. We present a case of 31 years old lady in early second trimester admitted in intensive care unit with subarachnoid hemorrhage due to aneurysm. She was exposed to anesthetic and neurosurgical challenges for clipping of the aneurysm, in a potentially fatal condition. The multidisciplinary team effort and timely medical intervention by clipping of intracranial aneurysm can be safe and effective for both the mother and the foetus.

KEYWORDS : Intracranial Aneurysm, Pregnancy, Aneurysm Clipping

INTRODUCTION

Though intracranial aneurysms are not very commonly seen during pregnancy, but the normal hemodynamic changes associated with pregnancy may increase vascular stress and risk of aneurysm formation, and its chances of progression and rupture.^{1,2,3} These cerebrovascular changes are thought to be secondary to increase in estrogen, progesterone and vascular endothelial growth factor hormones during pregnancy.⁴ The incidence rate of intracranial aneurysms has been estimated to be around 1.8% among women of child bearing age (16 to 44 years), but incidence of its rupture is not well established in the corresponding literature.^{4,5} Incidence rate of rupture of intracranial aneurysms is in the range of 0.001 to 0.01% of all the pregnancies⁶, but the associated case fatality from subarachnoid hemorrhage is reported to be as high as 83%.⁷ However the maternal and foetal outcomes can be improved with timely medical interventions. The case report documents the experience of therapeutic management of a young pregnant lady in early second trimester with intracranial aneurysm taken up for aneurysm clipping as sequelae of intracranial rupture leading to subarachnoid hemorrhage.

CASE REPORT

A 31yr old woman, second gravida, post caesarean section at 13 weeks of gestation, diagnosed as a case of early pregnancy with chronic hypertension on medication presented to a peripheral hospital. She presented with head ache, recurrent vomiting, and giddiness. Her past history revealed a single episode of seizure a year back for which she was not on any medication. She was transferred to neurosurgical unit on presentation. On examination, she was conscious, obeying commands but disoriented. MRI Brain revealed subarachnoid hemorrhage in anterior inter-hemispheric fissure with @ gyrus rectus bleed. MRA revealed 6.4x6.9 mm anterior communicating artery aneurysm. DSA revealed bilobed 12x7.4x6.1 mm A Com aneurysm directed superiorly and posteriorly, a small bleb at ICA bifurcation, on @ ICA injection. (Fig 1) Ultrasound abdomen revealed a 12-14 weeks single and viable foetus. Intraoperative anaesthetic goals were to prevent wide fluctuations in hemodynamics, maintenance of uteroplacental perfusion to ensure fetal and maternal wellbeing. The patient was pre medicated with 0.2 mg Glycopyrrolate, 100 mcg Fentanyl and induced with 100 mg Propofol. After ensuring adequate mask ventilation, Atracurium 25 mg was injected intravenously followed by lignocaine injection (preservative free) 60 mg to prevent intubation response. She was intubated with size 7.5mm endotracheal tube. Thereafter, balanced anesthesia was administered to the patient with oxygen and nitrous oxide in the ratio 1:1 and sevoflurane to attain a minimum alveolar concentration of 0.8 to 1.0. Invasive blood pressure monitoring was carried out through Rt radial artery cannulation and CVP was measured through Rt subclavian vein cannulation. Thereafter, the patient was handed over to the Neurosurgical team for clipping of aneurysm as planned surgical intervention. She underwent Right Pterional Craniotomy with clipping

of A Com artery aneurysm and bleb at Right Internal Carotid artery bifurcation. (Fig 2) Patient's mean arterial blood pressure was maintained between 90 to 110 mm of Hg throughout the procedure with infusion of Propofol and Nor-adrenaline. During the surgery, 2500 ml of Normal Saline was infused and the total urine output was 1600 ml along with total blood loss of 200 ml approx. Intra operative foetal cardiac status was assessed by the Anaesthesiologist through ultrasonography. Surgery was completed uneventfully. Postoperatively patient was shifted to neuro-intensive care unit for elective ventilation. Postoperative period was uneventful and she was extubated on second post op day. She was discharged on 14th post operative day with subtle left sided weakness without any cranial nerve deficit. Antiepileptics and nimodipine were continued. Ultrasonography showed a healthy and viable foetus. Regular ante natal follow-ups were advised till delivery. Patient was re-admitted at 32 weeks for elective caesarean section under neuraxial anaesthesia and delivered healthy male baby of 3010 gm with APGAR score 8/10, 9/10 at 1 and 5 min respectively. Postoperative period following LSCS was uneventful.



Fig 1: Digital Subtraction Angiography showing Anterior Communicating Artery (ACOM) aneurysm wide neck, bilobed ACOM aneurysm measuring 12 mm x 7.4mm x 6.1 mm

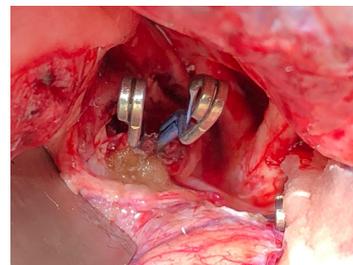


Fig 2: Aneurysmal Clip in situ

DISCUSSION

Diagnosis of Intracranial aneurysm in pregnancy is a rare but serious condition, may occur secondary to congenital defects in cerebral

vasculature.^{1,3} Other risk factors for the formation of aneurysms include family history of aneurysm, age greater than 50 years, female gender, smoking and cocaine use. Haemodynamic stress in pregnancy has been documented by numerous studies, which plays an important role in occurrence of intracerebral aneurysms.^{3,4} Unruptured intracerebral aneurysm in pregnancy can be managed conservatively with close monitoring with currently available non-invasive imaging techniques, prognosis of which remains generally poor.³

Rupture of these aneurysms leads to SAH, and it usually occurs in second and third trimester.^{4,8} Most intracranial aneurysms are asymptomatic and remain undetected until the time of rupture. SAH, although a medical emergency, remains the most common initial clinical presentation and is frequently misdiagnosed.^{3,5,6} The presenting features of SAH can be very similar to pre-eclampsia which is the most important differential diagnosis.^{3,5} After initial bleeding, there are high chances of recurrent bleeding with higher mortality.⁷ The investigations which aid the diagnosis include CT, lumbar puncture, MRI, MRA and DSA.^{7,9}

Surgical clipping or endovascular coiling is the intervention of choice for the intracerebral aneurysm.^{7,10} The neurosurgical procedure and caesarean section could be performed together to avoid repeated general anaesthesia.² The advantage of performing caesarean section before clipping of the aneurysm is that the fetus is not exposed to the deleterious effects of prolonged anaesthesia and induced hypotension. However, delaying clipping could be hazardous as induction of anaesthesia and intubation is known to increase intracerebral pressure and could precipitate rupture. There is no evidence to suggest that vaginal delivery should be avoided. However, instrumental methods to shorten the second stage and avoid Valsalva maneuvers is recommended. Some obstetricians prefer elective caesarean section.^{3,5}

CONCLUSION

Subarachnoid haemorrhage in pregnancy can be easily missed due to the rarity of the condition and similarity of symptoms with pre-eclampsia. A high index of suspicion with multidisciplinary team approach is important for early diagnosis and prevention of morbidity and mortality. This case report highlights anticipatory planning for timely medical intervention by clipping of intracranial aneurysm which can be safe and effective for both mother and the fetus.

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