

The Baby and The Brain

A Case Report on a Ruptured Arteriovenous Malformation (AVM) During Pregnancy

LAM Sophia Christy, SEE Ka Wing, YU Chi Hung, Cheung Fung Ching
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR

Background

There are increasing reports of ruptured AVM during pregnancy, with most associated with late pregnancy and postpartum. We report a case of a ruptured AVM in a 32-week pregnant lady.

Case Summary

A 32-year-old 32-week pregnant lady, G2P1, presented with acute onset right-sided weakness and an episode of a generalised tonic-clonic seizure. GCS E4V1M5, with right-side power 1.

CT brain showed a large left frontoparietal lobar haemorrhage, with bilateral intraventricular haemorrhage and hydrocephalus.

Emergency lower segment caesarean section was done immediately, followed by bilateral external ventricular drainage. Both mother and baby were well. Neurologically, the patient could obey commands with CSF drainage alone.

MRI confirmed a ruptured Spetzler-Martin grade 3 left frontal AVM, nidus 3.1 x 3.1 x 3.6cm.

DSA showed the AVM was arising from the left superior M2 branches, draining via superficial cortical veins into superior sagittal sinus.

A staged **AVM excision** was done on **Postpartum Day 9**. The operation was uneventful with no added neurological deficits.

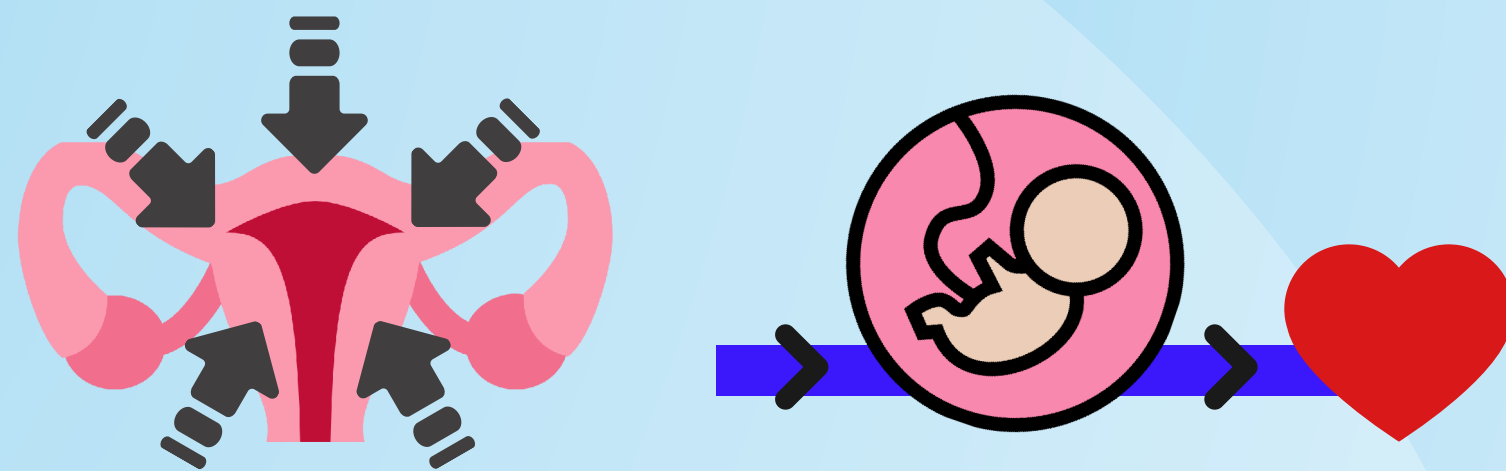
Neurological recovery was fair with residual mild expressive dysphasia and right hemiplegia. Her GCS was full. She was transferred to a rehabilitation centre for further care.

Discussion

Cardiac output

- **Increase** by **30-50%** during pregnancy and plateaus in the 3rd trimester
- A surge immediately after delivery due to uterine contraction & release of IVC compression

Hyperdynamic circulation can last up to **2 weeks** postpartum before gradually normalising¹



Autoregulation

- **↓ CBF** as pregnancy progresses
- **↓ CVR** to minimise the change in perfusion²
- **Vasodilatation ↑** blood flow in AVM and contributes to AVM rupture³

AVM resection during pregnancy - **Multidisciplinary Approach**

Obstetrics opinion : Continue with pregnancy / Delivery / Termination of pregnancy

Treatment modality according to **Spetzler-Martin Grading**

Early, NOT Urgent surgery

- Risk is considered lower as the above-mentioned changes gradually normalise by 2 weeks
- Unless there is significant mass effect

Other Considerations for the Baby

- **Avoid** hypothermia / induced hypotension / hyperventilation (same as the brain)
- **Positioning** in left lateral position can avoid IVC compression by the foetus
- **Risk of teratogenicity** is lowest in Carbamazepine

Conclusion

The best timing of surgery requires case-by-case discussion in a multidisciplinary team. Early and not urgent surgical intervention may be a reasonable approach to managing AVM in pregnancy if the mass effect is not of immediate concern.

Reference:

- 1 Soma-Pillay P, Nelson-Piercy C, Tolppanen H, Mebazaa A. Physiological changes in pregnancy. Cardiovasc J Afr. 2016;27(2):89-94.
2. Zeeman GG, Hatab M, Twickler DM. Maternal cerebral blood flow changes in pregnancy. Am J Obstet Gynecol. 2003;189(4):968-972.
3. Stieg PE, H. Hunt Batjer, Samson D. Intracranial Arteriovenous Malformations. CRC Press; 2006.