Letter to the Editor

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Spontaneous Intraparenchymal and Intraventricular Hemorrhage due to Arteriovenous Malformation in Pregnancy

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To the Editor,

Arteriovenous malformation (AVM) hemorrhage during pregnancy is a rare condition associated with high maternal and fetal morbidity and mortality. Whether pregnancy increases the risk of AVM rupture remains controversial. Hemodynamic changes during pregnancy are predicted to increase the risk of bleeding (1,2). This report presents maternal and fetal outcomes following a spontaneous intracranial hemorrhage secondary to AVM rupture during pregnancy.

A 32-year-old patient at 18 weeks' gestation, with a history of AVM surgery four years earlier, was admitted to the adult emergency department after awakening with a severe headache, vomiting, and a seizure. The patient had no prior history of seizures or substance use. This was her fourth pregnancy; she had previously undergone three cesarean sections. Upon arrival, persistent seizures lasting two hours necessitated intubation and transfer to the neurology service. The patient had not undergone prenatal screening tests for this pregnancy. On examination, a viable pregnancy consistent with 18 weeks' gestation was confirmed, with no obstetric pathology detected. Brain computed tomography revealed a large hemorrhagic area in the left parieto-occipital region extending into the ventricles (Figure 1).

Digital subtraction angiography identified a residual AVM, measuring approximately 21×15×12 mm, in the left high frontoparietal region, supplied by feeding arteries from the anterior cerebral artery and draining into the superior sagittal sinus via a cortical vein (Figure 2).

The patient underwent a left frontotemporoparietal decompressive craniotomy (Figure 3).

She was transferred to the neurosurgery ward on postoperative day 27 and was discharged on postoperative

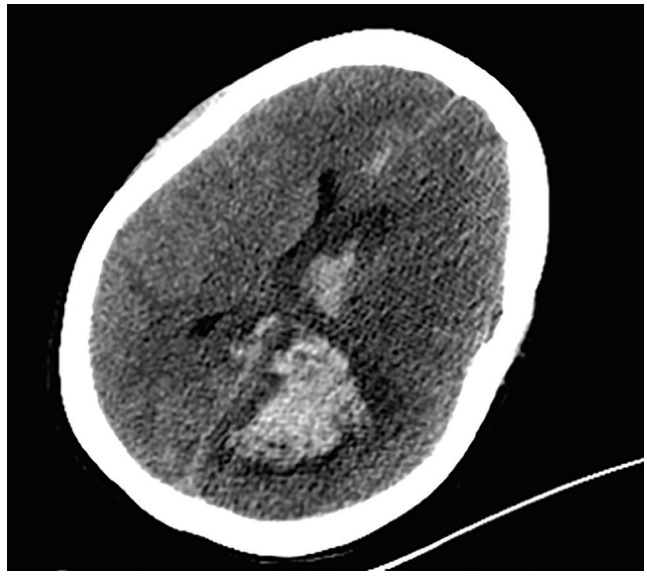

Figure 1. Preoperative cerebral CT scan showing a large hemorrhagic area in the left parieto-occipital region extending into the ventricles

CT: Computed tomography

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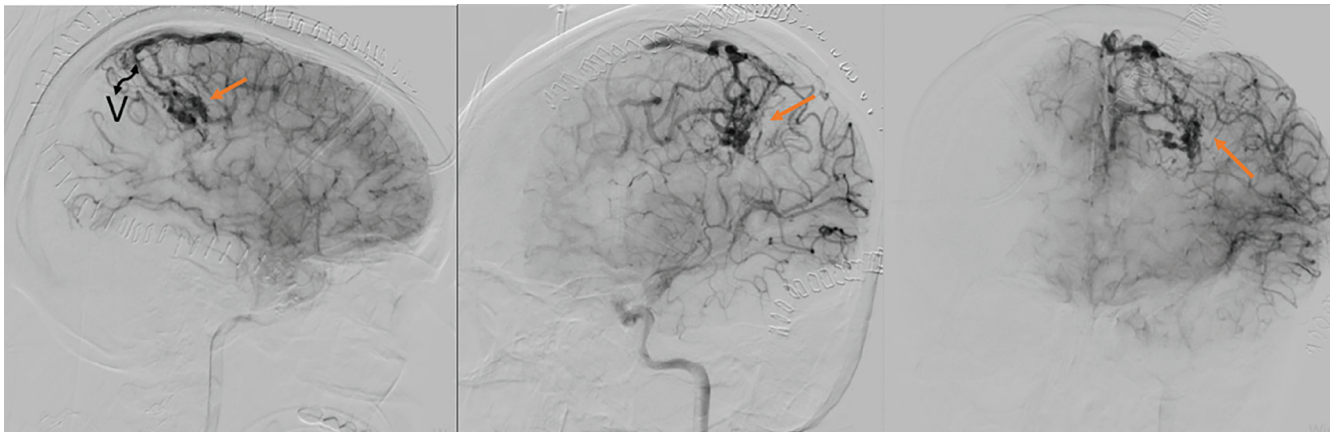

Figure 2. Digital cerebral angiography: arteriovenous malformation nidus (arrow) draining into the superior sagittal sinus via drainage veins

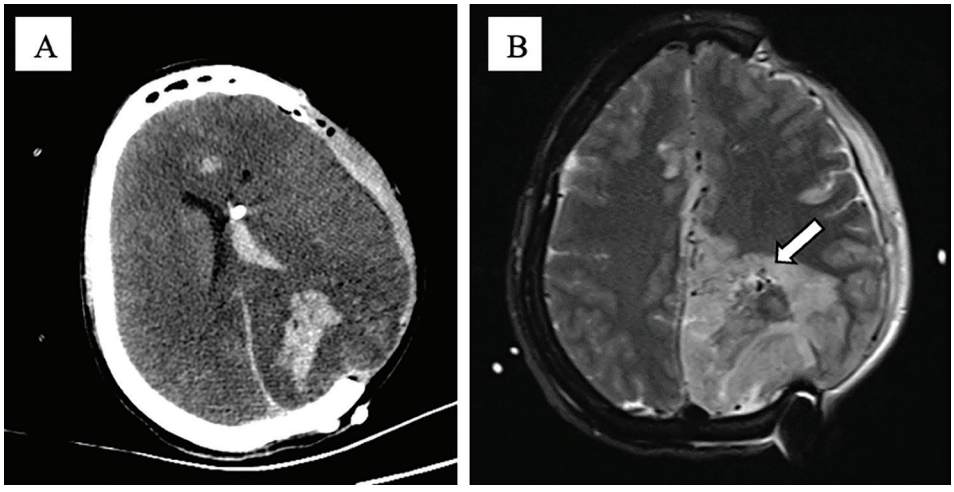

Figure 3. (A) Cerebral CT scan: postoperative left frontotemporoparietal decompressive craniotomy. (B) Postoperative MRI: hemorrhagic area in the left parieto-occipital region and arteriovenous malformation nidus (arrow)

CT: Computed tomography, MRI: Magnetic resonance imaging

day 29 with preserved consciousness, limited verbal responsiveness, and right-sided hemiplegia. During hospitalization, the quadruple screening test indicated a low risk. A second-trimester fetal anomaly scan revealed no abnormalities. At 35 weeks and 5 days of gestation, the patient presented to the obstetrics emergency department with labor pain. A cesarean section was performed, resulting in the delivery of a male infant weighing 2,200 g, with 1- and 5-minute Apgar scores of 7 and 8, respectively. The neonate was admitted for transient tachypnea and discharged on the second day without complications. The patient was discharged in stable condition on postoperative day five.

A recent study reported that pregnancy increases the risk of AVM rupture, with higher rupture rates observed during the second and third trimesters (3). A Finnish nationwide study by Pohjola et al. (4), analyzing data from more than 1.7 million births, demonstrated that approximately 43% of AVM ruptures occurred during the second trimester and nearly 24% during the third trimester. The authors also reported that, when appropriately managed, the majority of patients experienced relatively favorable outcomes. Another study reported a pooled AVM hemorrhage rate of 0.16 per pregnancy and emphasized the importance of individualized management strategies (1).

This case highlights several important clinical considerations: residual AVM following prior surgical intervention may rupture during pregnancy; aggressive neurosurgical management can be compatible with continuation of pregnancy; and close fetal surveillance throughout gestation enables timely identification of potential complications. Despite significant maternal morbidity, both the mother and the infant achieved favorable outcomes. This case further suggests that

pregnancy termination may not be mandatory, even following major neurosurgical procedures performed during the second trimester.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.C., F.S.K., M.D., Concept: M.C., F.S.K., Design: M.C., Data Collection or Processing: M.C., F.S.K., Analysis or Interpretation: M.C., F.S.K., M.D., Literature Search: M.C., F.S.K., Writing: M.C., F.S.K., M.D.

Conflict of Interest: No conflicts of interest were declared by the authors.

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