

Hypertensive Disorder of Pregnancy with Vertebral Artery Aneurysm and Vasospasm Led to Vertebral Artery Dissection – A Case Report

Habib SMA¹, Sultana A², Rahim R³, Alam MA⁴, Mohammad T⁵

ABSTRACT

Hypertensive disorder of pregnancy (HDP) can lead to various complications affecting maternal and fetal health. In this case report, we present the rare occurrence of vertebral artery aneurysm leading to vasospasm with vertebral artery dissection (VAD) in a woman having pregnancy-induced hypertensive disorder. Her clinical presentation, diagnostic evaluation, and management are discussed, highlighting the importance of early recognition and appropriate intervention. This case highlights the potential link between pregnancy-induced hypertensive disorders and a rare vascular complication like vertebral artery aneurysm which may lead to vertebral artery dissection. Current literature consists of a few incidences documenting adverse outcomes and management. The incidence of recurrence of such events (arterial aneurysm and dissection) in subsequent pregnancies is unknown. Timely recognition, appropriate diagnostic evaluation, and multidisciplinary collaboration are essential for optimal management and patient outcomes.

Keywords: Hypertensive disorder of pregnancy, vertebral artery aneurysm, vertebral artery dissection

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INTRODUCTION

Hypertensive disorder of pregnancy (HPD), including preeclampsia and eclampsia, are well-known complications during pregnancy that can result in significant maternal and fetal morbidity.¹ However, existing texts and literature hardly covers the links between pregnancy-induced hypertensive disorders

and vascular complications like aneurysm of arteries which sometimes needs immediate arterial dissection. Current evidence is limited to case reports and case series.² Moreover, some reports have shown that pregnancy-related strokes may result from vasculopathy and hypercoagulability; the exact mechanisms remain unclear though.^{3,4} Arterial dissection is a rare complication of pregnancy and puerperium. There have been reports of aortic, coronary and cervical artery dissection in association with pre-eclampsia; however, vertebral artery dissection (VAD) in course of hypertensive disorder of pregnancy and related vertebral artery aneurysm is very rare. Here, we present a rare occurrence of vertebral artery aneurysms leading to vasospasm that led to vertebral artery dissection in a woman with eclampsia in an antenatal setting.

CASE SUMMARY

A 45-year-old lady working as a religious teacher in a school presented herself to the Emergency Department of Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital, Bandar Seri Begawan, Brunei

1. Dr. SM Ahsanul Habib, Medical Officer, Department of Critical Care Medicine, Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital, Bandar Seri Begawan, Brunei Darussalam.
2. Dr. Arifa Sultana, Medical Officer, Maternal & Child Health, Ministry of Health, Bandar Seri Begawan, Brunei Darussalam.
3. Dr. Riffat Rahim, Assistant Professor, Department of Obstetrics & Gynaecology, Mugda Medical College & Hospital, Dhaka-1214, Bangladesh.
4. Dr. Mohammad Ashraf Alam, Assistant Professor, Department of Cardiology, National Institute of Cardiovascular Diseases (NICVD), Dhaka-1207, Bangladesh.
5. Dr. Taneem Mohammad, Assistant Professor, Department of Anaesthesia, Analgesia, Palliative and Intensive Care Medicine, Dhaka Medical College Hospital, Dhaka-1000, Bangladesh.

Address of Correspondence: Dr. SM Ahsanul Habib, Medical Officer, Department of Critical Care Medicine, Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital, Bandar Seri Begawan, Brunei Darussalam. Email: smahabib@yahoo.com

Darussalam, with pregnancy (third trimester), complaining of headache and drowsiness along with altered sensorium off and on. She had a history of gestational hypertension that she developed around the 24th week of pregnancy. She was taking routine tab. labetalol 100 mg thrice daily. Her obstetric history was G10 P7+2. She was found hypertensive at AE, and her BP was 165/115 mm of mercury. Her GCS was GCS E3V4M5, and with brisk pupils. No focal neurological deficit was noted. Her protein creatinine ratio was 23.2 (WNL), while her haemoglobin was 9.7 g/dL, WBC was 22.8, and platelet count 322. Serum Electrolyte, LFT, PT/APTT and INR were in acceptable range. Her Serum creatinine 57.9 mmol/L was and urea 3.8 mmol/L. She was diagnosed with eclampsia based on ACOG Diagnostic Criteria.

The Patient was closely monitored, and her blood pressure was managed with i.v. infusion of labetalol. She was scheduled for an emergency Cesarean section operation due to the severity of her preeclampsia. Postoperatively, the patient was transferred to HDU for monitoring. In the postoperative period, her GCS fluctuated, and she developed bilateral lateral rectus palsy (affecting the 6th cranial nerve). The neurosurgical team and intensive care unit were involved. Urgent CT scan of brain done that revealed supra and infratentorial acute subarachnoid haemorrhage with intraventricular extension, resulting in moderate communicating hydrocephalus. Cerebral angiogram showed bilateral ACA, while MCA and PCA are normal. Bilateral ICA and Basilar artery were also normal. No stenosis or aneurysm was seen.

The neurosurgical team inserted an EVD promptly, and the patient was kept in the ICU. She remained intubated. The neurosurgical team decided to do a DSA scan, which showed severe vasospasm in the

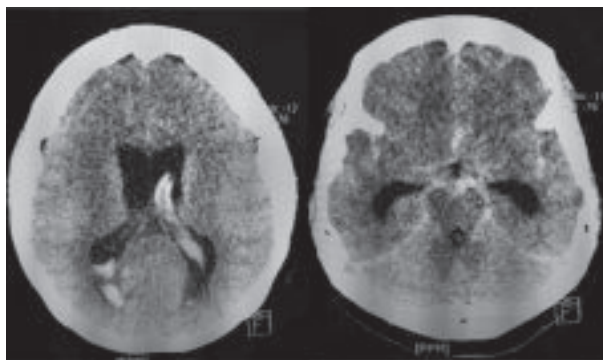


Fig. 1: CT scan of brain shows bilateral ACA.

vertebrobasilar arterial system, with possible dissection of the left vertebral artery. A suspected aneurysm was also identified. The patient was managed conservatively. Aspirin and heparin were given immediately. Nimodipine with anticonvulsants was also continued as per suggestion of neurosurgical consultants. Besides, i.v. infusion of labetalol was used for controlling hypertension.

She was gradually weaned from the 4th ICU day and extubated on the 6th ICU day. Her EVD was also removed on the 7th ICU day. Her GCS improved to E4V4M6, and she was found to be moving all four limbs, but muscle power was weak UL 3/5 and LL 3/5. She was transferred to the neurosurgical ward and referred to the physiotherapy department. She was discharged after one month with neurosurgical and occupational therapy follow-up. Her DSA scan was repeated after 2 months and found a left vertebral artery V4 Segment wide neck aneurysm. She was planning for endovascular stenting later.

DISCUSSION

Pregnancy-induced hypertensive disorders can have systemic effects on blood vessels, leading to several vascular complications.¹ The actual mechanism of VAD in association with HDP is still unknown. There is a paucity of population-based data to establish the association between HDP and arterial aneurysms and the sequelae of events.⁵ Hypertensive surge is possibly a risk factor as the vertebral artery is prone to mechanical damage of hypertensive surge. Maternal endothelial dysfunction in HDP and the endothelial damaging effect of hypertensive surge potentially increases the risk of dissection.^{6,7} Incidence of recurrence of such event (arterial aneurism) in subsequent pregnancies is unknown.⁷ Evidence showed that the association between preeclampsia and vertebral artery aneurysm is rare but underscores the importance of vigilance in managing hypertensive disorders during pregnancy.⁸ Similar patient profiles, presentation and outcomes were reported by several researchers.^{6,9-11} Given the presence of collateral circulation, unilateral vertebral artery dissections may go unrecognized and may be more common than suspected. VAD is an important differential diagnosis, if women present with headache and neck pain, particularly in HDP.¹²

CONCLUSION

This case highlights the potential link between pregnancy-induced hypertensive disorders and a rare vascular complication like vertebral artery aneurysm which may lead to dissection of the vertebral artery. Current literature consists of a few incidences documenting adverse outcomes and management. Timely recognition, appropriate diagnostic evaluation, and multidisciplinary collaboration are essential for optimal management and patient outcomes. Healthcare providers should be aware of those potential complications when managing pregnant women with hypertensive disorders.

REFERENCES

1. Mammaro A, Carrara S, Cavaliere A, Ermito S, Dinatale A, Pappalardo EM, et al. Hypertensive disorders of pregnancy. *J Prenat Med.* 2009;3(1):1-5.
2. Salehi Omran S, Parikh NS, Poisson S, Armstrong J, Merkler AE, Prabhu M, et al. Association between pregnancy and cervical artery dissection. *Ann Neurol.* 2020;88(3):596-602.
3. Bushnell C, McCullough LD, Awad IA, Chireau MV, Fedder WN, Furie KL, et al. Guidelines for the prevention of stroke in women: a statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke.* 2014;45(5):1545-88.
4. Grear KE, Bushnell CD. Stroke and pregnancy: clinical presentation, evaluation, treatment, and epidemiology. *Clin Obstet Gynecol.* 2013;56(2):350-9.
5. Kamel H, Roman MJ, Pitcher A, Devereux RB. Pregnancy and the risk of aortic dissection or rupture: a cohort-crossover analysis. *Circulation.* 2016;134(7):527-33.
6. Shanmugalingam R, Reza Pour N, Chuah SC, Vo TM, Beran R, Hennessy A, et al. Vertebral artery dissection in hypertensive disorders of pregnancy: a case series and literature review. *BMC Pregnancy Childbirth.* 2016;16(1):164.
7. DeCarlo C, Boitano LT, Molina RL, Weinberg I, Conrad MF, Eagleton MJ, et al. Pregnancy and preeclampsia are associated with acute adverse peripheral arterial events. *Arterioscler Thromb Vasc Biol.* 2021;41(1):526-33.
8. Adel Diab R, Shaheen N, Mohamed A, Tarek Hefnawy M, Chofan Charo D, Meshref M. Clinical characteristics, course, and outcomes of vertebral artery dissections in the postpartum period; a pooled analysis of published case reports. *Arch Acad Emerg Med.* 2023;11(1):e26.
9. Manasewitsch NT, Hanfy AA, Beutler BD, Antwi-Amoabeng D, Taha M, Elnaggar M, et al. Postpartum vertebral artery dissection: case report and review of the literature. *Thromb J.* 2020;18(1):30.
10. Drazin D, Rosner J, Shirzadi A, Phuphanich S. Postpartum extracranial bilateral vertebral artery dissection mimicking subarachnoid hemorrhage. *Neurologist.* 2012;18(3):149-510.
11. Tuluc M, Brown D, Goldman B. Lethal vertebral artery dissection in pregnancy: a case report and review of the literature. *Arch Pathol Lab Med.* 2006;130(4):533-5.
12. Schoen JC, Campbell RL, Sadosty AT. Headache in pregnancy: an approach to emergency department evaluation and management. *West J Emerg Med.* 2015;16(2):291-301.