SciMedCentral

Annals of Vascular Medicine & Research

Case Report

Cerebellar Arteriovenous Malformation Bleeding in Pregnant: A Case Report

Helbert de O. Manduca Palmiero, Ricardo Chmelnitsky Wainberg, Ricardo Lourenço Caramanti, Yair Ugalde Hernández, and Feres Eduardo Aparecido Chaddad*

Department of Neurosurgery, Federal University of São Paulo, Brazil

***Corresponding author**

Feres Eduardo Aparecido Chaddad, Department of Neurosurgery, Federal University of São Paulo, Unifesp, 715, Napoleão de Barros Street, 6th floor, São Paulo, SP, 04024-002, Brazil, Email: fereschaddad@hotmail.com

Submitted: 14 April 2017

Accepted: 27 June 2017

Published: 30 June 2017

ISSN: 2378-9344

Keywords

- Cerebelar arteriovenous malformation
- Pregnancy
- Intracerebral bleeding
- Hydrocephalus

Abstract

Infratentorial arteriovenous malformations are less common than supratentorial AVMs. However, there is major reported bleeding and greater morbidity and mortality in the latter. Cases of AVM during the pregnancy are uncommon.

Case presentation: This is a case about a pregnant woman, in the third trimester, which presented seizure and decreased consciousness level. The team verified posterior fossa bleeding with obstructive hydrocephalus. We implanted external ventricular drainage, after we performed the childbirth by caesarean and then indicated microsurgery for exeresis the cerebellar AVM.

Discussion: The relation between pregnancy and AVMs bleeding is known but uncommon. In the case presented, we treated the hydrocephalus, performed the delivery and then performed the exeresis of AVM. Microsurgery is the most indicated treatment for infratentorial AVMs. The patient presented good clinical evolution.

ABBREVIATIONS

AVM: Arteriovenous Malformation; SCA: Superior Cerebellar Artery

INTRODUCTION

Cases of arteriovenous malformations of the brain often present bleeding, seizures, progressive neurologic deficits and headache in patients in their 20s to 40s [1]. The annual bleeding rates are 3-4% [1]. Posterior fossa AVMs are less common and correspond to 7-15% of all cases, reported annual hemorrhage rates for this specific AVM are up to 11.6% [2]. There are authors who suggest that pregnancy would increase the risk of bleeding [1, 3-6]. The microsurgical treatment of posterior fossa AVMs is the gold standard, and the initial clinical manifestation influences the medical decision [7,14,15].

CASE PRESENTATION

A 32-year-old pregnant woman, at 36 weeks, was admitted in the emergency room. She presented systemic arterial hypertension that started in the third trimester without treatment and was admitted at dawn after having seizure followed by decreasing level of consciousness. The patient was placed on the mechanical ventilator; the team identified subaracnoid hemorrhage, and considered the hypothesis of eclampsia. She was sedated. This patient had a previous pregnancy without obstetric pathologies, but with patent foramen ovale. She did not present systemic arterial hypertension, or diabetes mellitus. It was not the case of smoking, alcohol intake or drug abuse either. She was then referred to another hospital under sedation, isochromatic and myopic pupils, to a vascular neurosurgeon on duty. We performed a computerized tomography scan and identified a hyper dense lesion in the left cerebellar hemisphere with obstructive hydrocephalus, approximate volume of 5 ml (3.4 X 2.1 X 1.4 cm). An external ventricular drainage was performed while the patient was under intensive care. The delivery by caesarean procedure followed. In MRI and arteriography, we then identified cerebellar arteriovenous malformation. The AVM of the patient originated from the left superior cerebellar artery. Because it was located in superior cerebellar peduncle, with deep venous drainage and nidus smaller than 3 cm, it was graded III by Spetzler-Martin classification [8]. After multidisciplinary discussion, we chose microsurgical treatment. The patient was operated in park bench position because she had patent foramen ovale. The surgeon choseretro sigmoid access and performed total resection of the AVM. The patient was discharged after 3 months with good clinical evolution presenting Glasgow 15 and cerebellar syndrome. Because of gait disturbances and dysmetria, she was advised to start a treatment with physical therapy. The control brain arteriography did not show residual AVM (Figures 1-5).

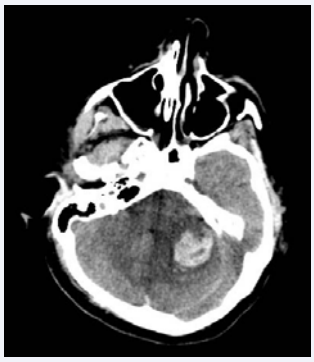

Figure 1 Initial CT scan showing bleeding in posterior fossa.

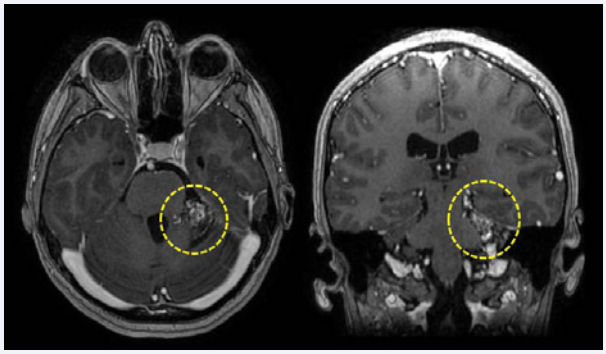

Figure 2 T1 MRI with contrast show a vascular lesion in upper left cerebellar peduncle (yellow circle).

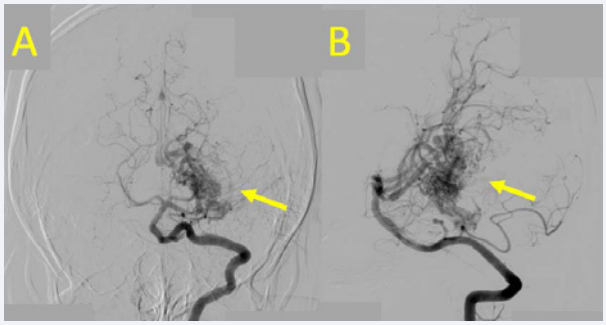

Figure 3 Preoperative angiography – Arteriovenous malformation irrigated by left superior cerebellar artery. A: anteroposterior view of posterior circulation and B: lateral view.

DISCUSSION

Infratentorial AVMs are less common than supratentorial AVMs, less than 15% of cases [1]. The initial clinical manifestation is mainly due to bleeding with annual rates three times greater compared with supratentorial lesions [1,2,5,7]. In the case presented, the patient had a grade III AVM in posterior fossa with nidus smaller than 3 cm. Infratentorial AVMs are most commonly located in the cerebellar hemispheres and are 3-5 cm in size with arterial nutrition by SCA [4]. The rates of mortality and morbidity are bigger when the AVMs are in posterior fossa and there is clinical presentation because of the proximity to critical structures, brainstem and cranial nerves such as the troclear and trigeminal nerve [2]. The risk factors associated with higher rates of bleeding are deep venous drainage and small nidus [1,9]. The relationship between pregnancy and higher bleeding risks is yet not clear and the end of pregnancy is the critical period for clinical manifestation [6]. In the case presented, the patient was in the third trimester with subarachnoid hemorrhage. It is know that systemic arterial hypertension is associated with higher risks of bleeding [6]. Studies suggest that the risk of AVM bleeding during pregnancy is greater because of hormonal changes, cardiac function alteration and coagulation [1,10]. This relationship should justify contraception in women with AVM [11]. The end of gestation, the delivery and the puerperium are moments of higher risk of bleeding and the cesarean delivery is indicated [11]. A recent study designed with a larger population sample did not find higher risks of rupture of AVMs among pregnant women and because of these findings the contraception was not indicated in such cases [13]. Combined or single treatment with radiosurgery, embolization and microsurgery is indicated for AVMs treatment [7,9], based on Spetzler-Martin classification [8]. The treatment based just in radiosurgery is not the best option forit has lower obliteration rates. Multimodal treatment with embolization and microsurgery is related to high rates of cure for AVMs grade III and IV mainly [13]. However, the microsurgery is the gold standard because the AVM is excluded from circulation immediately and the resection rates are above 90% with rates of morbidity and mortality between 15-20% [7,14,15]. Some researchers

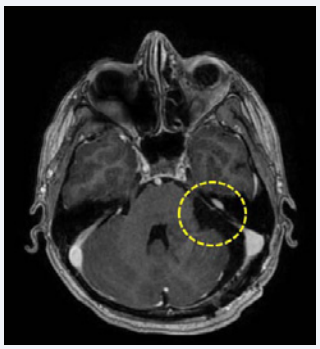

Figure 4 Postoperative T1 MRI without arteriovenous malformation (yellow circle).

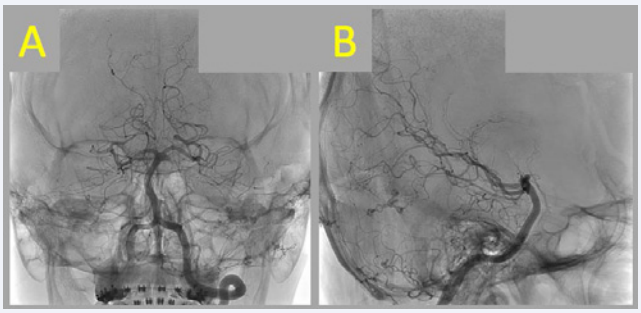

Figure 5 Postoperative angiography without arteriovenous malformation. A: anteroposterior view of posterior circulation and B: lateral view.

suggest maintaining the pregnancy if there is bleeding and the delay of the final microsurgical treatment [12]. Hemodynamic abnormalities during the surgery that can cause fetal hypoxia would justify the microsurgery after the childbirth. However, the surgical management of AVM can be done before delivery if there is bleeding [12]. In the case reported, the patient was in coma with hydrocephalus and intracranial hypertension, so we decided to resolve the hydrocephalus with ventricular shunt and lying-in. The patient underwent surgery after multidisciplinary clinical discussion. The microsurgical treatment of infratentorial AVMs is decided depending on the surgical expertise and AVM`s location [15]. Some neurosurgeons choose semi-sitting positioning for easy viewing and less bleeding [3,6]. The patient had patent foramen ovale and this condition requests park-bench position justified by lower thoracic pressure and lower intracranial pressure [3,6,15]. Previous bleeding can facilitate the surgery if performed after 4 to 6 weeks from initial presentation. Gliosis and haemosiderin halo form a pseudo-capsule functioning as a cleavage zone [4,15], and this condition was found during the surgery. Therefore, a complete exercise of AVM was performed. In this case reported, the patient had good evolution after the treatment of an uncommon presentation of AVM in an uncommon clinical condition, that is, AVM during the pregnancy. We emphasize the joint clinical decision among specialists. The AVM was totally removed by surgical procedure and we were able to discharge the patient in good clinical condition.

REFERENCES

1. Fleetwood IG, Steinberg GK. Arteriovenous malformations. Lancet. 2002; 359: 863-873.
2. Arnaout OM, Gross BA, Eddleman CS, Bendok BR, Getch CC, Batjer HH. Posterior fossa arteriovenous malformations. Neurosurg Focus. 2009; 26: E12.
3. Drake CG, Friedman AH, Peerless SJ. Posterior fossa arteriovenous malformations. J Neurosurg. 1986; 64: 1-10.
4. Betjer H, Samson D. Arteriovenous malformations of the posterior fossa. J Neurosurg. 1986; 64: 849-856.
5. Abla AA, Nelson J, Caleb RW, Young WL, Kim H, Lawton MT. The natural history of AVM hemorrhage in the posterior fossa: comparison of hematoma volumes and neurological outcomes in patients with ruptured infra- and supratentorial AVMs. Neurosurg Focus. 2014; 37: E6.
6. Abecassis IJ, Xu DS, Betjer HH, Bendok BR. Natural history of brain arteriovenous malformations: a systematic review. Neurosurg Focus. 2014; 37: E7.
7. Almeida JP, Medina R, Tamargo RJ. Management of posterior fossa arteriovenous malformations. Surg Neurol Int. 2015; 6: 31.
8. Spetzler RF, Martin NA. A proposed grading system for arteriovenous malformations. J Neurosurg. 1986; 65: 476-483.
9. Viñuela F, Dion JE, Duckwiler G, Martin NA, Lylyk P, Fox A, et al. Combined endovascular embolization and surgery in the management of cerebral arteriovenous malformations: experience with 101 cases. J Neurosurg. 1991; 75: 856-864.
10. Robinson JL, Hall CS, Sedzimir CB. Arteriovenous malformations, aneurysms and pregnancy. J Neurosurg. 1974; 41: 63-70.
11. Finnerty JJ, Chisholm CA, Chapple H, Login IS, Pinkerton JV. Cerebral arteriovenous malformation in pregnancy: presentation and neurologic, obstetric and ethical significance. Am J Obstet Gynecol. 1999; 181: 296-303.
12. Agarwal N, Guerra JC, Gala NB, Agarwal P, Zouzias A, Gandhi CD, et al. Current treatment options for cerebral arteriovenous malformations in pregnancy: a review of the literature. World Neurosurg. 2014; 81: 83-90.
13. Liu XJ, Wang S, Zhao YL, Teo M, Guo P, Zhang D, et al. Risk of cerebral arteriovenous malformation rupture during pregnancy and puerperium. Neurology. 2014; 82: 1798-1803.
14. Kelly ME, Guzman R, Sinclair J, Bell-Stephens TE, Bower R, Hamilton S, et al. Multimodality treatment of posterior fossa arteriovenous malformations. J Neurosurg. 2008; 108: 1152-1161.
15. O`Shaughnessy BA, Getch CC, Bendok BR, Batjer HH. Microsurgical resection of infratentorial arteriovenous malformations. Neurosurg Focus. 2005; 19: E5.

Cite this article

de O. Manduca Palmiero H, Wainberg RC, Caramanti RL, Hernández YU, Aparecido Chaddad FE (2017) Cerebellar Arteriovenous Malformation Bleeding in Pregnant: A Case Report. Ann Vasc Med Res 4(3): 1058.