Atypically Large Arteriovenous Malformation: A Surgical Challenge

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Abstract

Arteriovenous malformation (AVM) is an abnormal connection between arteries and veins, bypassing the capillary system. The majority of AVMs involve the extremities, head and neck, and lungs. We report a case of a 20-year-old female with a large, high flow AVM at unusual location. The perforators of this malformation were originating directly from lumbar arteries, revealed by computed tomography angiography. In the absence of facilities of embolizing feeder vessels, such large AVM gave us a great surgical challenge in terms of dissection, raising the mass, ligating perforators, and avoiding skin loss.

Key Words: Arteriovenous fistula, arteriovenous malformation, venous malformation

Introduction

Arteriovenous malformation (AVM) is an abnormal connection between arteries and veins, bypassing the capillary system. The reported incidence rate of newly diagnosed AVMs has varied in different population-based studies from 0.89 to 1.34 cases per 100,000 people per year.¹ AVMs can be divided into following parts: Feeding arteries, nidus, and draining veins. The feeding arteries may be single or multiple in number but are deficient of muscularis layer and do not form capillaries.²,³

Case Report

A 20-year-old female patient presented to us with the chief complaints of large swelling over the lower back. When first noticed during childhood, swelling was of lemon size to the left of lower back. It gradually progressed to the present size. The patient remained asymptomatic over the years, but for the past 5 years, she started developing bluish discoloration over the swelling along with burning sensation and itching. During the period of the past 1 year, intermittent pain in swelling compelled her to seek medical advice. On examination, a swelling of size 30 cm length × 20 cm width × 10 cm height was present on the lower back across the spine having greater bulk on the left side. Surface was irregular with enormous bluish prominences. Swelling was warm, soft in consistency, pulsatile, nonmobile, partially compressible, fixed to the overlying skin. Bruit was present on auscultation. Systemic examination was unremarkable.

All routine blood investigations, chest X-ray, and electrocardiogram were in normal limits. Computed tomography scan [Figure 1] showed a large bunch of vessels mushrooming in subcutaneous plane with some intramuscular vessel lakes. More than twenty perforators directly from the lumbar arteries and left common iliac artery were feeding the malformation.

The patient was posted for surgery under general anesthesia. As a routine technique of removing AVMs, large elliptical incision (transverse direction) was given over the swelling and an attempt to raise the skin flap made. As vessels were densely adhered to the skin, every single stroke of knife led to high flow bleed. Intercepting the danger of uncontrolled bleeding, we took deep and big plicating sutures at the margin of lesion. Anonymously, it was decided to apply compression dressing and postpone the surgery for a week. Three days later, dressing was to be changed. As the dressing was peeled off, multiple jets of blood sprouted from the wound site. Forecasting the mishap, the patient was immediately taken to emergency room, anesthetized, and prepared for surgery. This time, strategy was made to raise the mass along with the skin from deep muscle layer. Large transverse “U”-shaped incision was given along the margin of the mass and keeping open end on right side of back [Figure 2a and b]. Meticulously, mass was raised from deep...
Management of AVMs by a multidisciplinary approach that integrates surgical therapy with embolization and sclerotherapy appears to improve the results and management with limited morbidity and no recurrence during early follow-up. Embolization/Sclerotherapy is a new therapeutic modality that is accepted as independent therapy, especially for surgically inaccessible lesions.

Large AVMs should be treated by hybrid procedure, i.e., perforators should be embolized first to reduce the size and then excision to be undertaken. Due to limited resources, this patient could not be embolized. However, the surgical approach of raising the mass from deeper tissue along with skin flap in this case came out to be more beneficial in terms of lesser blood loss, easy tackling of perforators, and no skin loss avoiding requirement of skin grafting.

**Conclusion**

Hybrid procedure of conjoining embolization of perforators and excision of mass is a promising technique to deal large AVMs with high flow or having perforators emerging from aorta and its major branches. In the absence of embolization facility, raising the vascular mass along with the skin from deeper tissue, ligating perforators, and then excising the vascular bulk underneath the flap is the better choice.

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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Laakso A, Dashti R, Juvela S, Niemelä M, Hernesniemi J. Natural history of arteriovenous malformations: Presentation, risk of hemorrhage and mortality. Acta Neurochir Suppl 2010;107:65-9.
2. Ajiboye N, Chalouhi N, Starke RM, Zanaty M, Bell R. Cerebral arteriovenous malformations: Evaluation and management. ScientificWorldJournal 2014;2014:649036.
3. Martin NA, Vinters HV. Arteriovenous malformations. In: Carter LP, Spetzler RF, Hamilton MG, editors. Neurovascular Surgery. New York, USA: McGraw-Hill; 1995. p. 875-903.
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4. Ledson MJ, Wahbi Z, Harris P, Walshaw MJ. A large pelvic arteriovenous malformation in an adult patient with cystic fibrosis. Postgrad Med J 1999;75:353-4.
5. Lee BB, Do YS, Yakes W, Kim DI, Mattassi R, Hyon WS. Management of arteriovenous malformations: A multidisciplinary approach. J Vasc Surg 2004;39:590-600.
6. Lee BB, Kim DI, Huh S, Kim HH, Choo IW, Byun HS, et al. New experiences with absolute ethanol sclerotherapy in the management of a complex form of congenital venous malformation. J Vasc Surg 2001;33:764-72.
7. Belov S. Anatomopathological classification of congenital vascular defects. Semin Vasc Surg 1993;6:219-24.
8. Mulliken JB. Cutaneous vascular anomalies. Semin Vasc Surg 1993;6:204-18.