Scalp Arterio-Venous Malformation: Case Report and Review Literature

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INTRODUCTION
An arterio-venous malformation (AVM) is an abnormal fistulous connection between the feeding arteries and draining veins, without an intervening capillary bed within the subcutaneous layer. AVM of scalp are relatively rare vascular lesions present as an innocuous looking subcutaneous scalp lump or a large pulsatile mass with a propensity to massive haemorrhage.¹² AVM are usually present at birth but commonly manifest in childhood or adolescence.⁸ Its management is difficult because of its complex vascular anatomy, high-shunt flow (in high-flow AVM), intracranial connection (when present) and possible cosmetic complications.

Various treatment options that have been described to treat these lesions, include: surgical excision,¹³¹⁴ ligation of feeding vessels, transarterial and transvenous embolization,¹⁶ injection of sclerosant into the nidus and electro thrombosis.¹⁴ Here, we have described the surgical management of scalp vascular malformations.

CASE REPORT
A 35 year old lady presented with the symptoms of pulsatile swelling over right side of scalp since 1 year with no history of trauma, headache, tinnitus, convulsions, fever. On examination she had a well defined pulsatile swelling of size 3x3 inches over right parieto-occipital region. Swelling was compressible, non tender with no underlying bony defect. Fluctuation test was positive. Transillumination test was negative. Engorged vein was seen.

On auscultation bruit was heard. Her MRA revealed serpiginous flow voids in right parieto-occipital region with feeding arteries arising from posterior auricular branch of right external carotid artery S/o arteriovenous malformation. She underwent surgery under general anaesthesia right external carotid artery ligated, clipping of feeding vessels of AV malformation and excision of vascular lesion from underneath the skin using monopolar and bipolar cautery. Skin protusions excised, wound closed leaving a vacuum drain. Post operative period was uneventful.
DISCUSSION

The AVM are abnormal fistulous communications between the feeding arteries and draining veins, without an intervening capillary bed situated within the subcutaneous layer of scalp. The main sources of blood supply to the scalp are located in the subcutaneous tissue and originate from the external carotid, occipital and supraorbital arteries.[7] The superficial temporal artery is frequently involved in traumatic cirrhotic aneurysm due to its long unprotected course.

The draining veins are grossly dilated and tortuous and may show variceal dilation. The dilation of vascular channels often results in deformity of the scalp that is usually not life threatening but can cause substantial cosmetic and social disturbances. In low-flow (i.e., cavernoma, cavernous hemangioma, venous malformation and sinus pericranii), usually, no arteriovenous
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shunt is present and they are seen as well demarcated lesions. The origin of AVM of the scalp is uncertain, but trauma is an important factor in most of the cases, though some are congenital (spontaneous) in origin.

Management of scalp arteriovenous malformation is difficult because of its high shunt flow, complex vascular anatomy and cosmetic problems. The treatment options include surgical excision,[1,2,3] ligation of feeding vessels, transarterial and transvenous embolization,[3,8] injection of sclerosant into the nidus and electro thrombosis.

Surgical excision is the most common and successful method of dealing with scalp AVM.[3] Various techniques have been used to control the haemorrhage during surgery including percutaneous sutures of feeding vessels, interlocking suture along the line of incision, and the use of tourniquet and intestinal clamp over the base of flap. As scalp AVM has a potential to evolve, the anomalous arteriovenous communication must be completely eliminated because recurrence or enlargement is reported after an incomplete treatment.[3] Incomplete treatment can also cause scalp necrosis & bleeding.

Endovascular treatment of scalp AVM can be used as definitive therapy or as adjuvant to surgical therapy in reducing blood loss during excision.

Embolisation of both feeders and nidus before surgery is safer than embolization of the feeders alone when considering preoperative embolization to reduce the risk of massive haemorrhage.[3]

Three different approaches have been used to access the fistula, namely femoral transarterial, femoral transvenous and direct percutaneous catheterization of the feeding vessels.[3,4,8] Direct percutaneous catheterization of fistula has been used whenever access through the artery or vein is not possible.[8] The percutaneous placement of thrombogenic coils is a simple and effective method to produce thrombosis of cirsoid aneurysm of scalp, especially after slowing down the blood flow through transvascular embolization.

CONCLUSION

AVM of scalp is relatively rare phenomenon. Angiogram is the gold standard investigation to delineate the lesion and to exclude an intracranial component and surgical excision is treatment of choice.

CONFLICT OF INTEREST:
None declared.

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REFERENCES: