



CLINICO- PATHOLOGICAL STUDY OF CIRSOID ANEURYSM: AN INSTITUTIONAL EXPERIENCE

<b>Dr Avdhesh Shukla</b>	Associate professor, Department of Neurosurgery, Gajra Raja Medical College, Gwalior, Madhya Pradesh
<b>Dr Arti Sharma*</b>	MD Pathology, Gajra Raja Medical College, Gwalior, Madhya Pradesh *Corresponding Author
<b>Dr Anand Sharma</b>	Assistant Professor, Department of Neurosurgery, Gajra Raja Medical College, Gwalior, Madhya Pradesh
<b>Dr S N Iyengar</b>	Head of Department, Department of Neurosurgery, Gajra Raja Medical College, Gwalior, Madhya Pradesh

**ABSTRACT**

Cirsoid aneurysm also known as scalp arterial-venous malformation is rare entity, characterised by abnormal fistulous connections between supplying arteries and draining veins without an intervening capillary network in the subcutaneous plane of the scalp. Mostly presented with pulsatile scalp mass, rarely with active haemorrhage from lesion. Angiography is gold standard investigation and management require selective embolization of feeding vessels followed by surgical excision in selected cases.

**KEYWORDS** : Cirsoid aneurysm, scalp, arterial-venous malformation

**Introduction**

Cirsoid aneurysm or arteriovenous malformation (AVM) of the scalp is a rare vascular lesion that is characterised by abnormal fistulous connections between supplying arteries and draining veins without an intervening capillary network in the subcutaneous plane of the scalp. The scalp AVM comprises of 8.1% of total AVM and more common in young adults.

Cirsoid aneurysm usually secondary to aberrant persistence of primitive arteriovenous interconnections due to defective differentiation of the primary vascular complex<sup>2</sup>. This state of high shunt flow between the two distinct vessel types and the complex vascular anatomy makes their treatment a challenging undertaking. We collect and review the retrospective data of scalp arterial-venous malformation with review of literature regarding clinical presentation, location and management strategy.

**Material and Method:**

The present study was retrospective study, based on data retrospectively collected from department of neurosurgery, GR Medical College and group of hospitals (GRMC) from 2010 to 2018. All patients with scalp AVM were included in study. Diagnosis was based mainly on the clinical picture of pulsatile swelling in the scalp with bruit and thrill (figure 1). The following investigations were done preoperatively: Plain and contrast-enhanced CT, MRI, MR angiogram, if needed to document the location, size, feeding arteries, and venous drainage of the lesions and if there are associated intracranial lesions. In CT skull, the lesion appeared as soft tissue scalp swelling while in MRI as numerous flow voids underlying the subcutaneous tissue. Although, angiography is the gold-standard investigation to delineate the lesion and to exclude an intracranial component, MRA was a good non-invasive alternative. No patient had undergone prior interventions for the lesion. Symptomatic patients under went excision of lesion. Surgery follow standard steps included biconoral incision (If anterior lesion) or posterior incision (Figure 2). Local anesthetic solution with adrenaline was injected at the site of skin incision, avoiding direct intravenous injection. The incision was carried down to the pericranium and all tissues superficial to that were reflected with the lesion. At the circumference, the large vessels entering the aneurysm were individually ligated and divided. Once the scalp flap was raised, the lesion could be seen and palpated through the galea. The galea around the lesion was incised and the lesion was separated from the underlying skin using a combination of bipolar diathermy and sharp dissection. After excision of lesion closure

done in standard fashion. Histopathology of these lesion revealed vascular structures composed of densely aggregated thick- and thin-walled vessels, separated by fibrous tissue which was consistent with the finding of arterio-venous malformation.

**Figure 1: showing Cirsoid aneurysm with multiple dilated vascular channels**



**Figure 2: Showing site of incision for posterior lesions**



**Results**

The study was conducted on 15 patients. There were 13(86.6%) male and 2(13.3%) females. The mean age of the patients were 28 years. All the patients were presented with pulsatile swelling over scalp with bruit. Two patients had ulceration over swelling but no active bleeding found. One patient had headache but no intracranial lesion on CT scan (Table 1).

**Table 1: Clinical presentations of Cirsoid aneurysm**

Symptoms	Number	Percentage
Pulsatile swelling	15	100
Ulceration	2	13.3

Headache	1	6.6
Active haemorrhage	0	0
Others, Neurological deficit	0	0

Most common location of Cirroid aneurysm was temporo-parietal region in 9(60%) cases, followed by frontal region in 4 (26.6%)cases, parietal and occipital scalp in single cases as mentioned in table 2.

**Table 2: Location wise distribution of Cirroid aneurysm**

Location	Number	Percentage
Temporo-parietal	9	60
Frontal	4	26.6
Parietal	1	6.6
Occipital	1	6.6
Multiple	0	

CT angiography were perform in 8 cases, most common artery involved were superior temporal artery 6 (75%), supraorbital and middle meningeal artery were involve in 3 cases (34%). Posterior auricular was involved in 2 cases while occipital artery was involved in 1 case.

**Table 3: CT angiography finding in 8 cases**

Artery	Number	Percentage
Superior temporal artery	6	75
Supra orbital artery	3	37.5
Middle Meningeal artery	3	37.5
Posterior auricular artery	2	25
Occipital artery	1	12.5

All cases under went surgical excision of lesion. Wound dehiscence was found in 3 cases, skin necrosis was developed in one case.

**Discussion**

AVM of the scalp is an uncommon entity. The vascular malformation of the scalp is an abnormal arteriovenous communication situated within the subcutaneous fatty layer of the scalp with the feeding arteries derived from the vessels supplying the scalp. Various names are used to describe the vascular malformations of the scalp, including aneurysm cirroides, aneurysm serpentinum, plexiform angioma, arteriovenous fistula, and AVM. The most frequent sites of involvement are frontal, temporal, and parietal regions <sup>3,4,5,6</sup>. The origin of the main feeder is in the subcutaneous tissue of the scalp. The origin of these main feeders, most frequently, arises from the external carotid, occipital, and supraorbital arteries. The superficial temporal artery is frequently involved in traumatic cirroid aneurysm due to its long unprotected course.<sup>7</sup>

The lesion usually begins as a small, subcutaneous lump in the head that over a period of time evolves into a large deforming mass. A bruit or a throbbing headache might be the chief complaint in some patients. Other presenting symptoms include pulsatile tinnitus or rarely, hemorrhage from the mass<sup>8</sup>. Occasionally, large lesions may be associated with scalp necrosis. Congestive heart failure has occurred with large fistulas. Also large lesions are rarely associated with cerebral steal phenomenon that resulted in neurological symptoms including seizure.

Angiography is the gold standard investigation to delineate the lesion and to exclude an intracranial component. Management of scalp arteriovenous malformation is difficult because of its high shunt flow, complex vascular anatomy and cosmetic problems. The indication of treatment includes cosmetic relief of the pulsatile mass, prevention of hemorrhage and other symptoms such as headache and tinnitus. The treatment options include surgical excision, <sup>9</sup>ligation of feeding vessels, transarterial and transvenous embolization, injection of sclerosant into the nidus (5 6) and electro thrombosis.

**REFERENCES**

- Hasturk AE, Erten F, Ayata T; Giant non- traumatic arteriovenous malformation of the scalp. *Asian Journal of Neurosurgery*. 2012; 7(1): 39-41.
- Poonam Gupta, Neha Gupta, Jai Chaudhary, Hemant K M ishra, A P Verma. cirroid

- aneurysm of the scalp. *MedPulse – International Medical Journal*. August 2016; 3(8): 729-731.
- Shenoy SN, Raja A. Scalp arteriovenous malformations. *Neurol India*. 2004;52:478–81.
- Massimi L, De Bonis P, Esposito G, Novegno F, Pettorini B, Tamburrini G, et al. Vertex scalp mass as presenting sign of a complex intracranial vascular malformation. *J Neurosurg Pediatr*. 2009;3:307–10.
- Heilman CB, Kwan ES, Klucznik RP, Cohen AR. Elimination of a cirroid aneurysm of the scalp by direct percutaneous embolization with thrombogenic coils. *Case report. J Neurosurg*. 1990;73:296–300.
- Burrus TM, Miller GM, Flynn LP, Fulgham JR, Lanzino G. NeuroImages. Symptomatic left temporal arteriovenous traumatic fistula. *Neurology*. 2009;73:570.
- Barnwell SL, Halbach VV, Dowd CF, Higashida RT, Hieshima GB. Endovascular treatment of scalp arteriovenous fistulas associated with a large varix. *Radiology* 1989;173:533-9.
- Heilman CB, Kwan ES, Klucznik RP, Cohen AR. Elimination of a cirroid aneurysm of the scalp by direct percutaneous embolization with thrombogenic coils. *J Neurosurg*. 1990;73:296–300.
- Domingo Z, Fisher-Jeffes ND, deVilliers JC. Surgical management of arterio- venous malformations of the scalp. In Schmidek HN, editor. *Operative neuro- surgical techniques: Indications, methods and results*. 4th Ed. Philadelphia: Saunders Company;2000. p. 1331-8.