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Arteriovenous Malformation of the Face Involving the Right Temporal Region: a Case Report and Literature Review

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Abstract | **Case Report**

Arteriovenous malformation (AVM) of the face is an uncommon condition. Clinical manifestations typically include local pain, pulsatile mass, headache, and less frequently, necrosis and hemorrhage. This study discusses and illustrates an unusual case of progressively progressive AVM of the right temporal region of the face in a 33-year-old woman. The diagnosis of vascular malformation was evoked on angio-CT. The treatment was surgical and consisted of complete removal of the tumor after vascular ligation. Histology confirmed the diagnosis.

Keywords: arteriovenous malformation, temporal region, angiography, histology, resection.

INTRODUCTION

Arteriovenous malformations (AVMs) are the rarest but most serious vascular malformations due to their progressive and recurrent nature [1]. They are hemodynamically active lesions, with high flow rate, related to an abnormal communication between feeding arteries and draining veins, without intermediate capillary bed, creating a vascular pack called "nestus".

It represents only 1.5% of all vascular anomalies, with 50% of lesions located in the maxillofacial region. The majority in the center of the face, nearly 70% involve the neck, nose, ears and upper lip [2].

In this article, we discuss the case of an AVM of the right temporal region of the face, subcutaneous in connection with the frontal artery branch of the superficial temporal artery. We review the available literature regarding the clinical, radiological characteristics and different therapeutic possibilities of facial AVMs [3].

CASE REPORT

Patient information: A 33-year-old female patient with no specific pathological history presented to the maxillofacial consultation of the military hospital of Marrakech with a right temporal swelling that had been evolving for 2 years. Initially asymptomatic but the evolution was marked by the increase in volume, appearance of headaches of the right hemiface constant and spontaneous associated with vision disorders of the type occasional flashes of light, All evolving in a context of apyrexia and conservation of the general state.

Clinical results: The clinical examination showed a conscious patient with GCS 15/15, hemodynamically and respiratorily stable, apyrexic. The maxillofacial examination revealed a soft, round, mobile, regular and pulsatile tumor in front of the right temporal fossa (Figure 1), without any other associated anomalies.

Diagnostic approach: Cerebral angiography showed a small right frontal vascular lesion in the superficial temporal fossa measuring 5x13x13 mm, connected to the frontal branch of the temporal artery. It was subcutaneous and related to the aponeurosis of the temporal muscle without any sign of infiltration (Figure 2).

Therapeutic intervention: Given its subcutaneous nature and its size and surgical accessibility, the decision of a surgical treatment was taken after multidisciplinary consultation between maxillofacial surgeon, vascular surgeon. A ligation of the pedicles of the frontal artery was carried out, followed by resection

of the nidus while respecting the underlying aponeurosis (Figure 3).

Histology: Was not of interest, showed the same aspect: arteriovenous malformation without sign of malignancy.

Follow-up and results: The patient was declared discharged 06 days after admission. The evolution was marked by a clinical improvement without local complications with disappearance of the symptomatology. Surveillance is necessary to detect any recurrence over a period of 05 years.

Figure 1: Photo of the patient showing a swelling of the temporal region

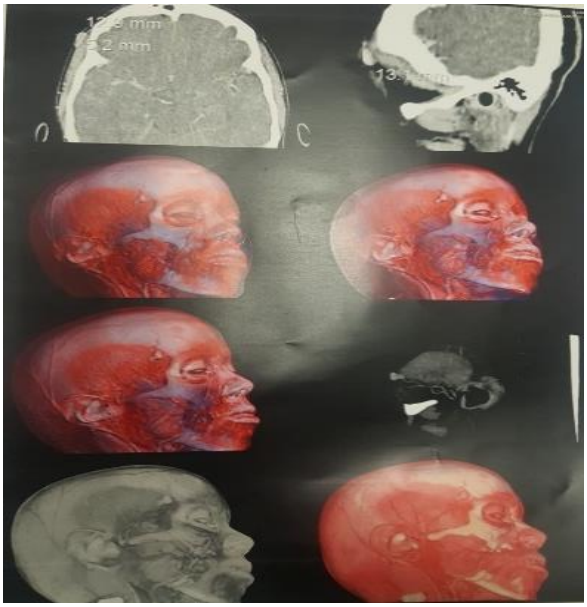

Figure 2: Cerebral CT angio axial section with volume reconstructions showing a right frontal vascular lesion

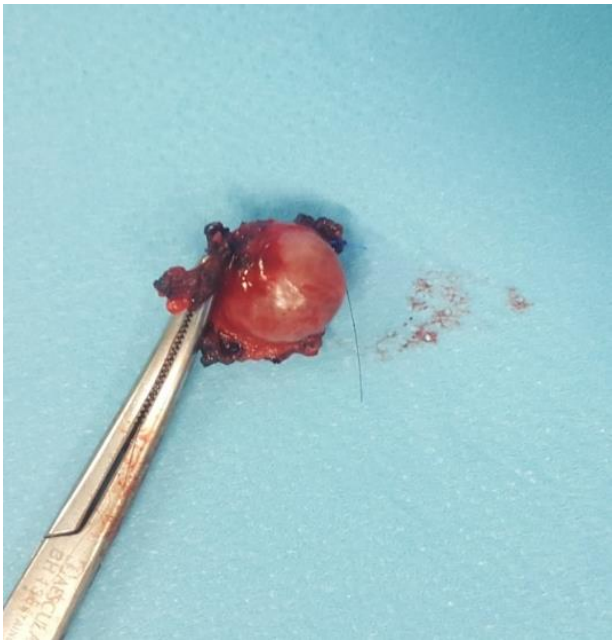

Figure 3: Photo of the nidus after excision

DISCUSSION

AVMs are rare lesions composed of multiple shunts consisting of arterioloveinular structures forming a nidus fed by several arteries and draining into several veins. There are 02 etiologies: congenital and traumatic.

They are often present at birth, but are not noticed until they cause aesthetic problems in adulthood. On the basis of endothelial characteristics, vascular lesions are classified into: hemangioma - vascular tumor and vascular malformations.

These two categories of vascular lesions have different etiologies and clinical characteristics. Hemangiomas are vascular tumors with endothelial hyperplasia that enlarge by rapid cell proliferation. They are normally absent at birth but proliferate during the first year of life and then involute.

Vascular malformations are congenital structural defects with normal endothelial cell turnover that are present at birth but usually become visible in later life.

The rapid enlargement of malformations is usually triggered by trauma or hormonal changes during puberty or pregnancy.

Furthermore, based on blood flow characteristics, vascular malformations can be divided into low-flow and high-flow lesions. Low-flow lesions include capillary, lymphatic, and venous malformations, whereas high-flow lesions include arterial malformations and AVMs [4].

The clinical presentation of facial AVMs varies from unsightly masses to devastating

hemorrhages. The diagnosis is most often suspected clinically in the face of a red cutaneous and/or subcutaneous swelling that shows signs of hemodynamic activity: increased local heat, thrill, auscultatory murmur. Other conditions, signs of a more advanced stage, should also lead to the diagnosis: significant or unusual pain, bleeding episodes, ulceration, localized muscle or bone hypertrophy.

The AVM worsens with time and can be classified according to the Schobinger staging system [5]. Dormant or quiescent stage, which may simulate a regressing planar angioma or hemangioma.

Expansion stage, the evolving flares are usually triggered by accidental or surgical trauma, or by hormonal changes such as puberty and pregnancy. This stage corresponds to a warm pulsating mass.

Destruction stage, during which necrosis, ulceration, lytic bone lesions are observed and correlated with the presence of pain.

Cardiac decompensation stage, which applies to the most severe cases, i.e. the most voluminous, and represents 2% of AVMs [1].

Current imaging techniques provide an accurate diagnosis of superficial AVMs as well as their angioarchitectures and extensions. Arteriography remains the most important examination, providing a true mapping of the vessels [6].

Echo-Doppler: is often performed as a first line of defence. It often confirms the diagnosis of AVM. It reveals an absence of tissue mass giving way to a vascular bundle with an increase in the size and number of vessels [7].

MRI and CT scan with injection of contrast medium: They allow visualization of the AVM and its extension; They offer an optimal overall view of the vascular structures of the malformation and its anatomical relationships with adjacent and deep organs.

Angio-MRI and arteriography: They will make it possible to establish the mapping of the lesion and therefore, by consequence, to plan the treatment by embolization or surgery.

Their evolution is the rule (growth, pain) and can cause skin ulcerations with a hemorrhagic risk that can put at stake the vital prognosis. Many cases of death have been reported in the literature. Heart failure is also a complication corresponding to Schöbinger stage IV.

The treatment of arteriovenous malformations is complex and requires a combined management by embolization and surgery.

The therapeutic attitude depends on the clinical stage at which the diagnosis is established: thus, a quiescent AVM (stage I), should not be operated, surgery remains indicated in the progressive or complicated forms (stages II to IV) as well as in front of an unaesthetic deformity, an annoying noise, intense headaches, or haemorrhage and necrosis [8].

There are different techniques and methods of treatment of these facial AVMs, including surgical excision, ligation of feeder vessels, intra-arterial and venous embolization, injection of sclerosing material into the nidus and eletrothrombosis [9].

The most selective embolization possible, followed by surgical excision removing the entire nidus, is the primary treatment.

Surgical excision is the most common method and must be complete in order to obtain a cure. Incomplete excision is almost always followed by recurrence, sometimes aggravation and sometimes life-threatening [10].

CONCLUSION

AVMs of the face are infrequent lesions, which can be dangerous and of unpredictable evolution. The prognosis is not necessarily bad; they can remain stable for years or, on the other hand, present an evolving relapse, a massive hemorrhage or an ischemia secondary to a badly conducted surgical procedure, which can engage the vital prognosis, hence the interest to choose the most adequate therapeutic method for each case.

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