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Non Traumatic Arteriovenous Fistula of the Superficial Temporal Artery

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Abstract: Spontaneous arteriovenous fistula (AVF) of superficial temporal artery (STA) is a very rare condition. The pathogenesis is poorly understood. The treatment may be surgical by excision or endovascular by embolization. A man was referred to our department for a tender pulsatile and painless mass in the left temporal region. On physical examination a thrill was palpated. Imaging revealed the presence of an AVF between STA and temporal vein. A complete surgical excision was successfully realised. The pathogenesis of spontaneous AVF of STA is poorly understood, the common treatment was surgical excision, and however endovascular embolization may be a safe, efficient option in the future.
Keywords: Arteriovenous fistula; superficial temporal artery; Spontaneous.

INTRODUCTION

AVF is an abnormal connection between artery and vein without an intervening capillary network. AVFs of the STA are surprisingly scarce given the superficial position of this vessel and the high incidence rate of both blunt and penetrating head trauma, indeed fewer than 40 cases have been reported in the literature mostly related to trauma or iatrogenic manipulation[1]. Spontaneous AVF of the STA are even morerare: solely reported by 4 authors [2-5]. In this article we present another case of nontraumatic AVF of the STA which was surgically treated, along with a review of the related literature.

CASE REPORT

A 43-years-old man was admitted to our vascular surgery department with a tender pulsatile mass in the left temporal area (Fig-1), complaining about a continuous audible buzzing sound, mainly in the left ear. The anamnesis reveal that this mass had gradually expanded over the previous 8 years, and had become not only a cosmetic problem but also a discomfort because of the murmuring in the ear of the patient, further questioning does not find a notion of head trauma during the few years past.

Physical examination found a round tender non mobile painless mass which measure 3x1,5cm, a strong thrill was palpated in the preauricular region, also murmurs could be heard over the draining vein, and it disappears with compression of the proximal superficial temporal artery. No scar was noted in the skin. A selective arteriography (

Fig-2) of left internal and external carotid through the right femoral approach with a 4Fr introducer objectified a full-canal inosculation between the feeding STA and draining dilated superficial temporal vein. The internal carotid circulation was normal. A duplex color doppler ultrasound examination

confirmed the diagnosis (

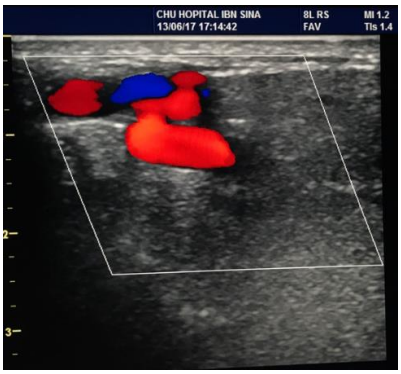

Fig-3), with a turbulent blood flow having a diastolic component, it also allowed to carry out precise cutaneous marking of the site of the fistula.

We preferred to treat the AVF by surgical ligation and excision. The patient underwent surgery under general anesthesia, in supine position, head turned to the right. After a longitudinal incision, the artery and the vein were carefully dissected and then ligated, the lesion was then completely resected. Pulsatile thrill and murmurs disappeared immediately after surgery. The post-operative course was uneventful, and the patient was discharged home the next day.

The histopathological examination showed that the vein and the artery were connected, and Morphological aspect was compatible with an arteriovenous fistula with fibro-elastic remodeling of the intima (

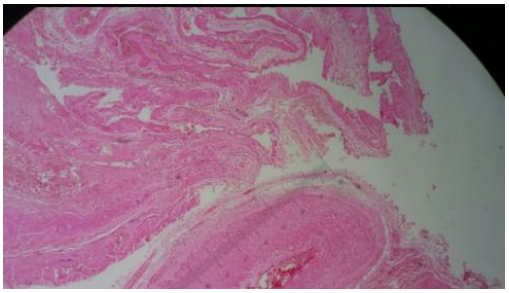

Fig-4).

Fig-1: Preoperative photograph of the left temporal pulsatile painless mass (COLOR in Print)

Fig-2: selective external carotid angiography confirmed AVF between the superficial temporal artery and temporal vein

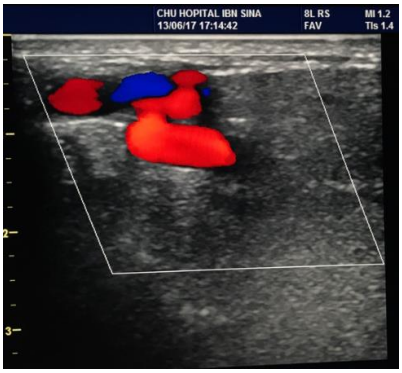

Fig-3: Duplex ultrasound color image of temporal superficial artery fistula (COLOR in Print)

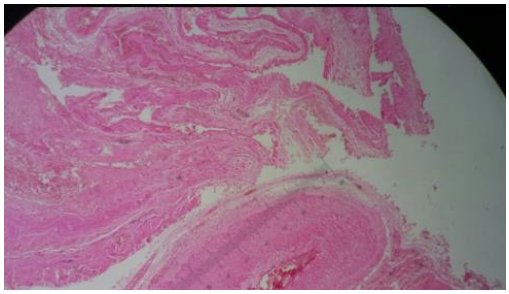

Fig-4: Microphotography showing the coexistence of vascular section, venous (upper) and arterial (bottom)

DISCUSSION

The superficial temporal artery emerges from the external carotid artery. It runs behind the mandible, and crosses the posterior root of the zygomatic process of the temporal bone. After travelling the zygomatic arch, it divides into two large terminal branches. The anterior branch is called the frontal. The posterior branch is called the parietal [6].

AVF of the STA is very rare, and the majority of cases are post-traumatic or of iatrogenic manipulation [7]. A spontaneous AVF of STA is exceptional, only very few authors report them5.

AVF could be a simple direct connection between a non-dilated feeding artery and draining vein, or may be complicated by a varicose aneurysm and tortuous dilated artery [2].

Etiology of spontaneous AVF of STA remains poorly known, some authors refer to the theory that congenital or atherosclerotic origin could be implicated [5]. In our case, we found a full-canal anastomosis at the arterio-venous shunt, with a dilated draining vein, Suggesting congenital arteriovenous malformation.

The clinical manifestations are mainly related to the size and topography of the fistula. In general, the lesions begin as a small mass on the temporal region, which will evolve towards a pulsatile mass gradually increasing in volume and creating a cosmetic discomfort. The reasons for consultation are primarily the bruit and flow-related sound and also headache, dizziness or haemorrhage. On physical examination, thrill and murmurs may be found, and it disappears with compression of proximal STA.

Selective angiography is the gold standard in the investigations; it confirms the clinical diagnosis, identifies the artery and helps to planning surgery or allows treating immediately through the same approach by embolization when endovascular treatment was decided. Non-invasive imaging may be useful for the diagnosis and flow-up (color Doppler ultrasonography, magnetic resonance angiography and computed tomography angiogram).

The surgical intervention is indicated to prevent the haemorrhagic risk, to relieve the symptoms: bruit and tinnitus, and for cosmetic purposes.

Open surgery is the most common treatment of AVF of STA, may consist of a complete excision of the lesion, or just a partial excision and ligation of the feeding vessels, but the risk of recurrence is high with this technique, because of the numerous anastomoses between branches of external carotid artery and the STA [8]. Endovascular embolization through a trans arterial, trans venous or percutaneous direct access, appears to have potential as a safe and effective therapeutic option for AVF of STA as the technologies and innovations in endovascular therapy continue to advance. It may be proposed as an exclusive treatment or as a first operative stage prior surgical excision, to reduce blood loss.

CONCLUSION

We report a unique case of AVF of STA, with no previous trauma history that we have treated

successfully by surgical excision. We do not have a great expertise in this extremely rare disease pathology however we think after review of the literature that endovascular surgery could have an important place in therapeutic indications of this condition.

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