

## TRUE ANEURYSM OF TEMPORAL SUPERFICIAL ARTERY ARISE SPONTANEOUSLY. CASE REPORT

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## SPONTANO NASTALA ANEURIZMA TEMPORALNE SUPERFICIJALNE ARTERIJE. PRIKAZ SLUČAJA

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### ABSTRACT

*Aneurysms of the temporal superficial artery (TSA) are very rare clinical entity. From 1861 to the present day, is described less than 200 cases. The most common cause of these aneurysms is so called blunt head trauma but there are described many cases of iatrogenic aneurysms, very rarely, aneurysms arise spontaneously. We report a case of 17-year-old patient with spontaneously forming aneurysm of TSA. Three months prior to admission, he noticed the existence of tumefaction localized frontotemporal on the right side. MSCT angiography of blood vessels of the scalp showed an aneurysm on the frontal branch of TSA diameter of 15 mm. The aneurysm was resected with uneventful postoperative course. PH findings pointed to a true aneurysm. Treatment protocol for the aneurysms of the TSA include clinical monitoring, compression of the aneurysm, the injection of thrombin, endovascular treatment and surgical resection. Surgical resection has proven to be a safe and effective treatment modality and still is the method of choice.*

**Keywords:** aneurysm, temporal superficial artery

### SAŽETAK

*Aneurizme temporalne superficialne arterije (TSA) su vrlo retke. Od 1861. godine do danas je opisano manje od 200 slučajeva. Najčešći uzrok nastanka ovih aneurizmi su tupe povrede glave, ali je opisan i veliki broj aneurizmi jatrogene etiologije, dok su spontano nastale aneurizme još ređe. Opisali smo slučaj pacijenta muškog pola, starog 17 godina, kod kojeg je dijagnostikovana sponatno nastala aneurizma TSA. Tri meseca pre hospitalizacije, pacijent je primetio postojanje tumefakcije u čeonoslepočnoj regiji sa desne strane. MSCT angiografija krvnih sudova poglavine je ukazala na aneurizmu čeone grane TSA dijametra 15mm. Aneurizma je hirurški eksicidirana, postoperativni tok je uredno protekao. Patohistološka analiza je pokazala da se radi o pravoj aneurizmi. Protokol za zbrinjavanje TSA aneurizmi podrazumeva kliničko praćenje, kompresiju aneurizme, injekciju trombina, endovaskularni tretman i hiruršku resekciju. Hirurška resekcija se pokazala kao siguran i efikasan modalitet lečenja i još uvek je metoda izbora.*

**Ključne reči:** aneurizma, temporalna superficialna arterija

### ABBREVIATIONS

MRI - Magnetic resonance imaging  
MSCT - Multislice computed tomography

PH - Patohistology  
TSA - Temporal superficial artery

### INTRODUCTION

Temporal superficial artery (TSA) is the terminal branch of the external carotid artery from that usually separates behind the angle of the mandible. It has two terminal branches, frontal and parietal. Aneurysms of the TSA are rare clinical entity. Thomas Bartholin has

published the case of a young patient who had blunt head trauma and who has aneurysms on the TSA in 1740 (1).

From 1861 to the present day is described less than 200 cases (2, 3). Indications for treatment of aneurysms of the



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TSA are headache, aesthetic reasons, and most importantly the prevention of aneurysm rupture or erosion of bone.

The most common cause of these aneurysms is so called blunt head trauma but there are described many cases of iatrogenic aneurysms, very rarely, aneurysms arise spontaneously.

We report a case of 17-year-old patient with spontaneous aneurysm of TSA.

## CASE REPORT

Male patient 17 years old noticed the existence of tumefaction localized on the right side of forehead three months prior to admission. He thought that the change is an atheroma and has not been to a medical examination. After two and a half months, the patient noticed that the change is increased in size and it became painfully sensitive to touch. Then he reported to our clinic.

By physical examination, we found pulsating palpatory painfully sensitive tumefaction measuring 1x2 cm. Flank mass was mobile in relation to the bone. MSCT angiography of blood vessels of the scalp showed an aneurysm on the frontal branch of TSA (Figure 1).

After preoperative evaluation, the patient was operated. The aneurysm was resected and the postoperative course was uneventful. The patient was discharged home the next day. Control MSCT angiography of blood vessels of the scalp showed absence of vascular anomalies. Sutures are removed 7 days after the surgery. PH findings pointed to a true aneurysm. In the period of fourth months of follow up, there were no signs of recurrence.

## DISCUSSION

Aneurysms of TSA is rarely seen. So far is described less than 200 cases of these aneurysms which are solitary in most cases, but sometimes can be multiple (4, 5). In 89% percent of reported cases were pseudo aneurysms, while the remaining 11% were true aneurysms of TSA (1). Pseudo aneurysms usually occur after blunt head trauma in 75% of cases (6, 7). The most commonly occur on the front branch of TSA because of its anatomical position. The frontal branch of TSA pass over upper temporal line where is the junction between frontal and temporal muscle and arteries passing through the hole between the two muscles and remains unprotected (8). Apart from blunt trauma to the head, there are also described cases of aneurysm formation after firearms injuries (9, 10).

Also, a certain percentage of pseudo aneurysms occurs iatrogenic after bypass surgery (11) after craniotomy (12), after a hair transplantation (13) and even as a complication of Botox injections (14). True aneurysms occur mainly spontaneously (15). Causes of it still is not completely understood. It is assumed that atherosclerotic changes may have important influence on the spontaneous occur-

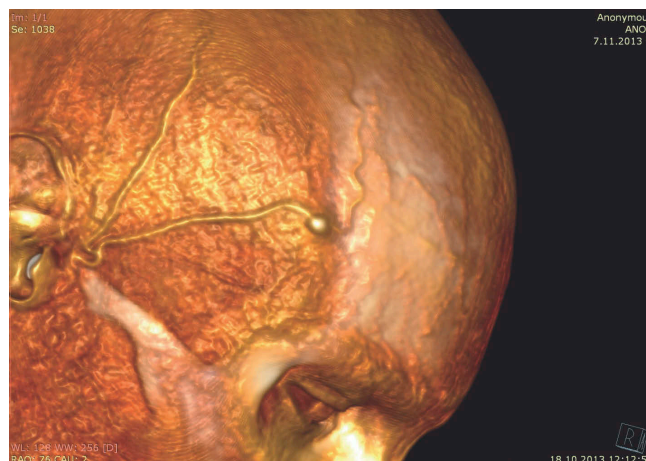


Figure 1. MSCT angiography of scalp blood vessels

rence of true aneurysms (16). In addition, given that the true aneurysms occur in younger patients, it must be assumed that there are other causes. According to some authors congenital defect of the vessel wall also has a role in the development of true aneurysms, as well as segmental arteriopathic amyloidosis (17) or non-specific temporal arteritis (5). Differentiation whether it is a true or pseudo aneurysms is only possible by histopathological analysis.

Aneurysms of TSA is usually first suspected after physical examination. It is usually presented as a subcutaneous non adhesive pulsating mass whose pulsations coincide with the pulsations of blood pressure. The use of duplex ultrasound can help in the diagnosis (18). Native CT scan and MRI exam can be used in differential diagnosis purposes to preclude the existence of fistula of medial meningeal artery (19). According to the review of the literature, some authors have used the DS angiography of blood vessels. By their opinion that accurate preoperative identification of afferent vessels accelerates and facilitates the identification of the aneurysm and its surgical excision (20). From our point of view, and according to other authors (1) the DSA is an invasive procedure and carries a minimum, but still existing, risk of stroke, dissection of intima of the vessels and bleeding, and as such is unusefull for this type of pathology. It is much safer and yet extremely illustrative 3D MSCT angiography (21) that we used in this case.

Unlike degenerative aneurysms of TSA, which are increased gradually over the time, traumatic aneurysms are usually increased rapidly over a period of 1 to 6 weeks after the trauma (22). The natural course of the disease is in most cases the rupture, rarely thrombosis.

In the treatment of aneurysms of TSA can apply conservative and radical methods. Treatment protocol for the aneurysms of the TSA include clinical monitoring, compression of the aneurysm, the injection of thrombin, endovascular treatment and surgical resection. Edwards M. R. published the first conservative treatment method for the aneurysm of TSA in 1861. The patient was student who was pressing the aneurysm and caused spontaneous thrombosis (4). Most of the patients, according to the

literature, underwent surgical resection of the aneurysm (23 - 25), which proved to be a safe and effective treatment. Still, there were described complications of surgery in the form of postoperative paresis n. VII (13, 26) and n. XII (most likely mobilization of the upper portion of the external carotid artery to be correlated to stretching of the nerve during the surgery) (23). Also, some authors for the treatment of aneurysms of the TSA suggest direct puncture and injection of thrombin with ultrasound navigation (27, 28). The disadvantage of this method is that it is difficult to control the dispersion of thrombin, which can lead to necrosis of the flap (29).

Standard endovascular intervention of coiling aneurysms (30, 31) may be an alternative to surgical resection in some cases and that in the case of aneurysms in the facial region. Still the potential embolic complications represent a significant limitation of this method. Some authors have used direct percutaneous coiling embolization of aneurysms guided by ultrasound (32).

## CONCLUSION

Aneurysms of the TSA are rare clinical entity. Indications for treatment of aneurysms of the TSA are headache, aesthetic reasons, and most importantly the prevention of aneurysm rupture or erosion of bone. Protocol treatment of aneurysms of TSA include clinical monitoring, compression of the aneurysm, the injection of thrombin, endovascular treatment and surgical resection. Surgical resection has proven to be a safe and effective treatment modality and it is the method of choice. In some cases, need to think about injections of thrombin or endovascular treatment.

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