



## CASE REPORT

### ANEURYSM OF EXTRACRANIAL INTERNAL CAROTID ARTERY: A CASE REPORT

Koray Ak<sup>1</sup>, Selim İsbir<sup>1</sup>, Mehmet Bayramiçli<sup>2</sup>, Atike Tekeli<sup>1</sup>, Süheyla Bozkurt<sup>3</sup>, Sinan Arsan<sup>1</sup>

<sup>1</sup>Marmara University, Cardiovascular Surgery, İstanbul, Türkiye <sup>2</sup>Marmara University, Plastic and Reconstructive Surgery, İstanbul, Türkiye <sup>3</sup>Marmara University, Pathology, İstanbul, Türkiye

#### ABSTRACT

A 42 year old man was referred to our hospital with a pulsatile left neck mass which had been diagnosed and treated as a reactive cervical lymphadenopathy for 3 months before referral. Diagnosis of an extracranial aneurysm of the left proximal internal carotid artery was made by magnetic resonance imaging angiography and digital subtraction angiography. Open surgical repair was performed by resection of the aneurysm and interposition of a reversed segment saphenous vein graft. Extracranial carotid artery aneurysms are uncommon pathologies and still challenging to diagnosis and treatment strategy. Awareness of this rare pathology in the differential diagnosis of head and neck masses would facilitate the diagnosis and prevent complications like cerebral thromboembolism. Surgical treatment is still regarded as a gold standard in the treatment of these cases. In this report, we presented a patient with an incidentally diagnosed aneurysm of extracranial internal carotid artery.

**Keywords:** Extracranial internal carotid artery, Aneurysm, Surgical treatment

### EKSTRAKRANİYAL INTERNAL KAROTİS ARTER ANEVİZMASI: OLGU SUNUMU

#### ÖZET

42 yaşında erkek hasta hastanemize sol boyun bölgesinde yerleşim gösteren pulsatil bir kitle ile gönderildi. Hasta kliniğimize gönderilmeden önceki dönemde başka bir merkezde reaktif servikal lenfadenopati nedeniyle 3 ay süreyle takip ve tedavi edilmiş. Ekstrakraniyal internal karotis arter anevrizması tanısı manyetik rezonans anjiyografi ve dijital substraksiyon anjiyografi ile konuldu. Anevrizma rezeksiyonu ve ters çevrilmiş safen ven interpozisyonu uygulanarak açık cerrahi onarım yapıldı. Ekstrakraniyal internal karotis arter anevrizmaları nadir görülen patolojiler olup halen tanı ve tedavilerinde bir takım zorluklar yaşanmaktadır. Nadir olarak rastlanan bu patolojilerin ayırıcı tanıda akılda tutulması hem tanının kolaylaşmasına hem de anevrizmaya bağlı gelişebilecek serebral tromboembolizm gibi birtakım komplikasyonların engellenmesine sebep olacaktır. Cerrahi onarım bu hastaların tedavilerinde hala altın standart olarak yerini korumaktadır. Bu olgu sunumunda, tesadüfen tanısı konmuş bir ekstrakraniyal internal karotis arter anevrizma vakası sunulmuştur.

**Anahtar Kelimeler:** Ekstrakraniyal internal karotis arter, Anevrizma, Cerrahi tedavi

#### İletişim Bilgileri:

Koray Ak, M.D.  
Marmara University, School of Medicine, Cardiovascular Surgery,  
İstanbul, Türkiye  
e-mail: korayak@marmara.edu.tr

Marmara Medical Journal 2009;22(1);052-055



## INTRODUCTION

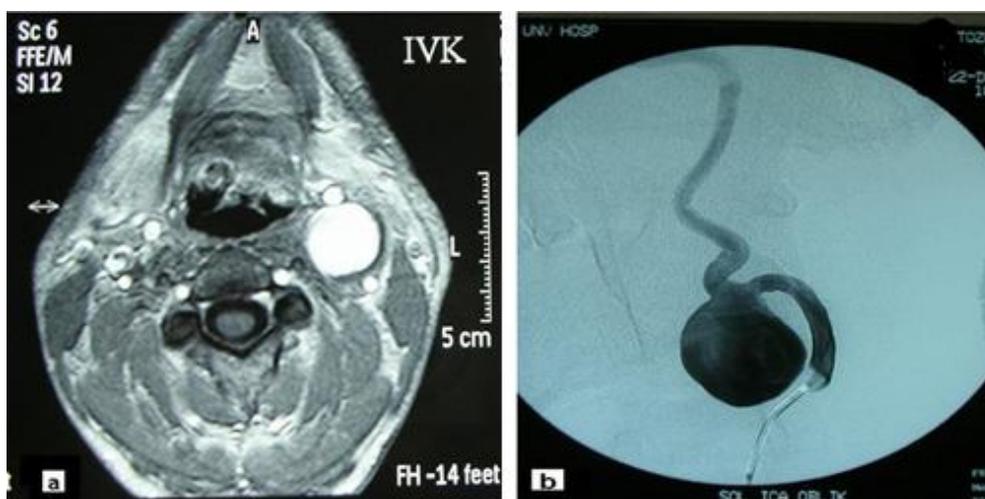
Extracranial carotid artery (ECA) aneurysms are extremely rare vascular lesions. The pathogenesis of these aneurysms can be inflammatory, traumatic, congenital, or previous operations like tonsillectomy. Atherosclerosis and traumatic cause has been shown to be a leading pathology in adults<sup>1,2</sup>. We reported an adult patient with an ECA aneurysm that was successfully treated by resection and a reversed segment saphaneous vein graft interposition.

## CASE REPORT

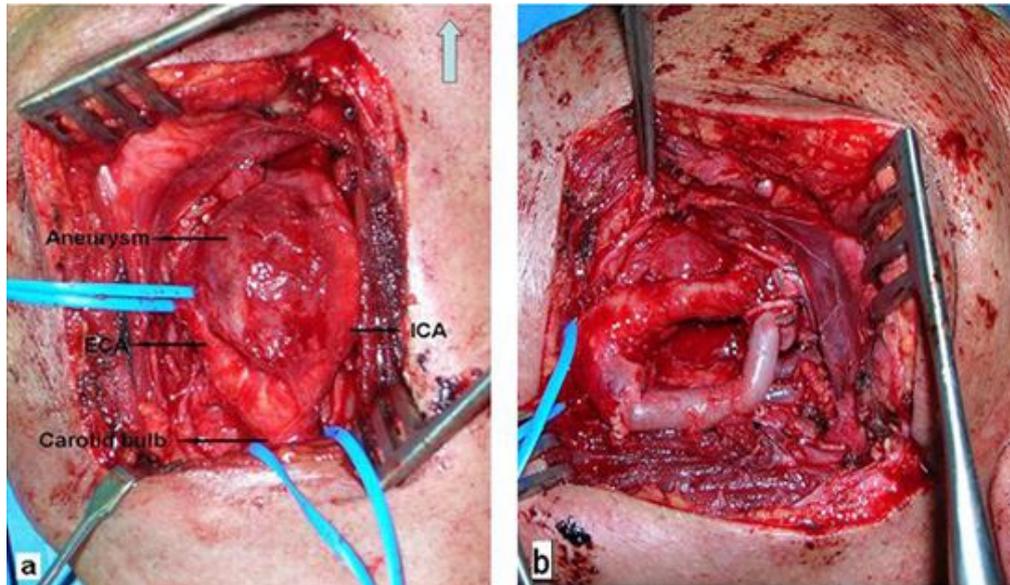
42 year old man admitted to an otolaryngologist with the symptoms of the infection of the upper respiratory tract (URT). According to the data obtained from the previous medical reports of the patient, hyperemia over the retropharyngeal region and a solid, weakly pulsatile mass situated anterior to the left sternocleidomastoid (SCM) muscle were detected on physical examination. It was reported to be poorly mobile, nontender and semi-solid in consistency. The mass was thought to be a regional lymphadenopathy (LAP) related to the present infection. Diagnosis of viral URT was made and oral supportive medications were prescribed. After 3 months, he was referred to our hospital for further evaluation because of the persistence of the mass. Our physical examination revealed a pulsatile solid cervical mass located anterior to the left SCM muscle

with the same previous characteristics. There was no audible bruit over the left carotid region. Diagnosis of a saccular aneurysm of left internal carotid artery (ICA) was made by MRI angio which revealed a partially thrombosed saccular aneurysm (27 mm x 25 mm x 40 mm in size) (Figure 1. a). An arteriogram revealed a saccular aneurysm originating from the proximal-portion of the left ICA (Figure 1. b).

Under appropriate general anesthesia a transverse neck incision centered over the bifurcation was made and the aneurysm was carefully dissected and exposed (Figure 2. a). The lumen of the aneurysm was partially filled by chronic and organized thrombus. Despite the ICA is redundant in length, proximal and distal ICA segments next to the stalk of the aneurysm were quite tortuous and calcified. Reversed saphaneous vein interposition was performed after aneurysmectomy and removal of the tortuous ends of the ICA (Figure 2. b). The time of carotid clamping was 24 minutes. The rest of the operation was completed in a standard fashion. Patient was discharged from hospital on the third postoperative day without any neurological deficit. He was still doing well 3 years after operation. Pathologic evaluation of the aneurysm revealed diffuse atherosclerotic changes occupying the medial and adventitial layers of the aneurysm.



**Figure 1:** a. Cervical MRI angio demonstrating mass which shows a regular contrast enhancement between left ICA and ECA, b. Selective arteriogram of left ICA showing a saccular aneurysm originating from the proximal left ICA (MRI: magnetic resonance imaging, ICA: internal carotid artery, ECA: external carotid artery).



**Figure 2:** a. Operative view of the proximal ICA aneurysm (ICA: internal carotid artery), b. Operative view showing repaired ICA aneurysm by resection and saphaneous vein interposition. Arrow indicates the reversed segment saphaneous vein graft (ICA: internal carotid artery).

## DISCUSSION

Extracranial carotid artery (ECA) aneurysms are rare entities confronting vascular surgeons in clinical practice. It has been reported that only 0.1 % to 2 % of all surgical procedures of the ECAs was performed for ECA aneurysms<sup>1,2</sup>. After excluding the cases with pseudoaneurysm related to the previous carotid endarterectomy, atherosclerosis continues to be the most common pathology. Other etiologic factors are trauma, carotid dissection and fibromuscular dysplasia, pregnancy and the like<sup>2</sup>.

The clinical presentation of the patients with ECA aneurysms varies from accidentally detected neck mass to neurological symptoms related to the rupture of the aneurysm. Majority of patients with an atherosclerotic pathology present with a hemispheric symptom<sup>2</sup>. Otherwise they are not easily recognized in the absence of neurological symptoms. El-Sabroun et al reported that almost all patients with ECA aneurysms are symptomatic and neurological symptoms related to cerebral ischemia occur as leading presenting symptoms in 41% of the patients<sup>2</sup>. Furthermore anterior cervical pulsatile mass, infection after previous carotid

endarterectomy, cranial nerve dysfunction, dysphagia, dizziness, tinnitus, carotid bruit and hemorrhage are the other symptoms frequently encountered in these patients<sup>1</sup>. The diagnosis of the ECA aneurysms presenting as a mass in the neck or pharynx is challenging to some extent and sometimes may be mistaken for a LAP, neoplastic or inflammatory lesions of the neck<sup>3,4</sup>. It has been known that when the sac of the aneurysm is full of thrombus or calcified or has a narrow ostium, pulsation over the mass may be absent. Even excessive manipulation during the physical examination may cause an iatrogenic embolic event.

Due to the high rate of cerebral embolic complications and mortality, surgical treatment is strongly advocated in the treatment of patients with ECA aneurysms whenever the diagnosis is made. Only in cases of postdissection or posttraumatic aneurysms, it is advised to postpone the surgical procedure at least 3 months after the occurrence of the lesions<sup>1</sup>. Different surgical procedures can be applied with respect to the extent and type of the aneurysm and some of which are resection and end to end anastomosis or grafting, aneurysmorrhaphy,



extracranial-intracranial bypass or ligation of ICA. Even though the selection of the type of the procedure should be individualized, resection and interposition of a venous graft is the most commonly applied surgical procedure<sup>2</sup>. Using a shunt during the surgery may be beneficial in patients with a contralateral carotid stenosis, history of stroke or prolonged duration of the carotid clamping. In these risky patients, continuous electroencephalographic monitoring is used to determine whether the use of a shunt is essential or not during the repair. According to a meta-analysis by Rosset et al<sup>2</sup>, surgical reconstruction of the ICA aneurysms resulted in a stroke risk of 6% and a mortality risk of 1.2% which were shown to be incommensurable with the risks of the nonoperative treatment.

Recently, certain endovascular therapies like graft stenting, endovascular balloon occlusion and coil embolization are gaining popularity in the treatment of ECA aneurysms. Initial reports were so pessimistic for preferring endovascular procedures in the treatment of these aneurysms due to the high risk of cerebral embolization and early occlusion of the endograft<sup>5</sup>. However, endovascular treatment of extracranial carotid artery aneurysms offers an advantage over open surgical therapy in terms of surgical dexterity especially in patients with distal ICA involvement and pseudoaneurysms related to previous CEA.

Major drawbacks of these procedures are that we still don't know the long term results exactly and more clinical data should be gathered to clarify their place in the management of ECA aneurysms.

In conclusion, the possibility of an ECA aneurysm should be always kept in minds in the initial evaluation of the patients with a neck mass. These aneurysms have a dismal progression if left untreated. The satisfactory results of present endovascular and open surgical techniques justify an aggressive approach in the treatment of these patients.

## REFERENCES

1. El-Sabroun R, Cooley DA. Extracranial carotid artery aneurysms: Texas Heart Institute experience. *J Vasc Surg* 2000;31:702-712
2. Rosset E, Albertini JN, Magnan PE, Ede B, Thomassin JM, Branchereau A. Surgical treatment of extracranial internal carotid artery aneurysms. *J Vasc Surg*. 2000; 31: 713-723.
3. Karas DE, Sawin RS, Sie KC. Pseudoaneurysm of the external carotid artery after tonsillectomy. A rare complication. *Arch Otolaryngol Head Neck Surg* 1997; 123: 345-457.
4. Zhou W, Lin PH, Bush RL, et al. Carotid artery aneurysm: evolution of management over two decades. *J Vasc Surg*. 2006; 43: 493-496.
5. Hertzner NR. Extracranial carotid aneurysms: a new look at an old problem. *J Vasc Surg*. 2000; 31: 823-825.