

A Giant Aneurysm of Extracranial Carotid Artery Presenting with Hoarseness: A Case Report and Review of Literature

Ses Kısıklığı ile Ortaya Çıkan Dev Kafa Dışı Karotis Arter Anevrizması: Olgu Sunumu ve Literatüre Bakış

Kürşad ÖZ,^a
M. Özer ULUKAN,^a
Okan YILDIZ,^b
Mehmet YENİTERZİ^a

Clinics of
^aCardiovascular Surgery,
^bRadiology,
İstanbul Mehmet Akif Ersoy
Thoracic and Cardiovascular
Training and Research Hospital, İstanbul

Geliş Tarihi/Received: 20.10.2014
Kabul Tarihi/Accepted: 15.12.2014

Yazışma Adresi/Correspondence:
Kürşad ÖZ
İstanbul Mehmet Akif Ersoy
Thoracic and Cardiovascular
Training and Research Hospital,
Clinic of Cardiovascular Surgery,
İstanbul,
TÜRKİYE/TURKEY
drkursadoz@gmail.com

ABSTRACT A 42-year-old female was admitted to our hospital with progressively enlarging pulsatile mass in the left lateral cervical region, hoarseness and pain radiating to left ear. Magnetic resonance angiography demonstrated a left internal carotid aneurysm, which extended from the carotid bifurcation nearly to the skull base, and a normal internal carotid artery (ICA) segment was found before the artery entered into the carotid canal. The aneurysmal segment was removed with resection of the bony structures, and direct arterial reconstruction was performed without any tension or damage to the cranial nerves. Pathological examination showed a true aneurysm with atheromatous changes. Follow-up after 2 years revealed a patent ICA.

Key Words: Carotid artery; giant aneurysm; hoarseness, end to end anastomosis

ÖZET Kırk iki yaşında kadın hasta, ses kısıklığı ve sol kulağa doğru yayılan ağrı ile birlikte boynunun sol yan kısmında zamanla belirginleşen ve pulsasyon veren kitle ile hastanemize kabul edildi. Magnetik rezonans anjiyografi tetkikinde karotis ayrımından kafa tabanına uzanım gösteren karotis arter anevrizması gösterildi. Anevrizmatik bölüm kısmi kemik rezeksiyonu yapılarak çıkarıldı ve herhangi bir kranial sinir hasarı veya gerginlik oluşturmaksızın uç uca anastomoz ile arter devamlılığı sağlandı. Patolojik incelemede, gerçek anevrizma olduğu tespit edildi. İki yıllık takipte internal karotis arterin açık olduğu gösterildi.

Anahtar Kelimeler: Karotis arter; dev anevrizma; ses kısıklığı, uç-uca tamir

Damar Cer Derg

Extracranial carotid artery aneurysms (ECAA) are very rare with an incidence of 0.5-1%, and they account for less than 1% of all peripheral artery aneurysms. Atherosclerosis is believed to be the primary etiological factor with rarer causes attributed to arterial dysplasia, dissection, trauma, connective tissue disorders and mycotic infection. Patients usually present with neurological symptoms (cerebrovascular accident, transient ischemic attack or Horner's syndrome) or a pulsatile mass in the neck. We report an ECCA which extended the skull base, and treated with resection of the aneurysm and reconstruction of internal carotid artery with a direct end to end anastomosis.

CASE REPORT

A 42-year-old female presented with a 6-month history of discomfort and progressive pulsatile mass in her left lateral cervical region, hoarseness, and pain radiating to left ear. She did not report any history of infection, trauma, previous surgical interventions or placement of a central venous catheter. Clinical examination revealed a pulsatile mass below left mandibular angle, in front of sternocleidomastoid muscle. Duplex scanning of carotid artery showed a vascular mass with a size of 3.5x4 cm between left internal and external carotid arteries. Magnetic resonance angiography (MRA) demonstrated a left internal carotid artery aneurysm, which extended from the carotid bifurcation nearly to the skull base (Figure 1). Surgery was performed to avoid development of the neurological symptoms. The aneurysm was explored via a standard anterior cervical approach, from the preauricular region down to the neck through the anterior border of the sternocleidomastoid muscle. The common carotid artery and the proximal part of the internal and external carotid arteries were identified by conventional methods and gentle dissection. Vagus, accessory and hypoglossal nerves were exposed and preserved. The aneurysm was dissected and resected after systemic heparinization (Figure 2). In this patient, not only brain activity was monitored continuously with NIRS (Near infrared spectroscopy- INVOS cerebral oxymetry -Somanetics Corporation, Troy, MI) but also the systolic internal carotid back pressure was measured as 60 mmHg. Therefore, an arterial shunt was not required. The continuity of the artery was restored without any tension, and a direct end-to-end anastomosis was done. Thus, clamping time was short. Postoperative recovery was uneventful. On the postoperative third day, the patient was discharged without any neurological complications or cranial nerve dysfunction. Pathological examination of the aneurysmal sac showed a true aneurysm with atheromatous changes (Figure 3). Follow-up after 2 years revealed a patent ICA.

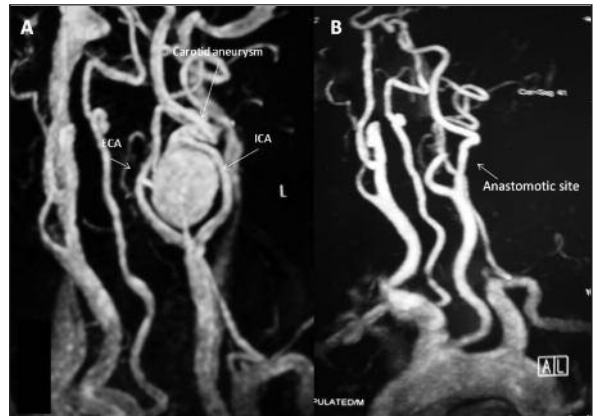


FIGURE 1: Preoperative magnetic resonance angiography image (left), and multislice contrast enhanced tomography of extracranial carotid artery aneurysm (right).

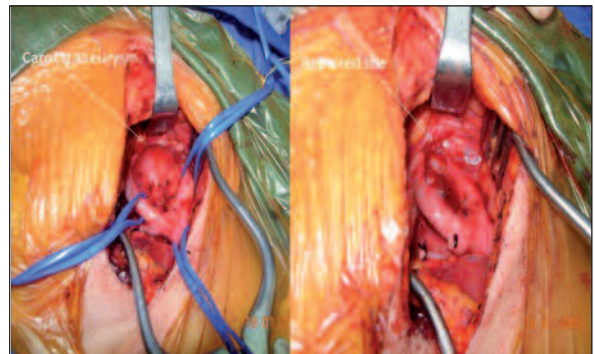


FIGURE 2: Intraoperative appearance of extracranial carotid artery aneurysm showing its extent near the skull base (left), and intraoperative appearance of direct end to end anastomosis of internal carotid artery after resection of the aneurysm (right).

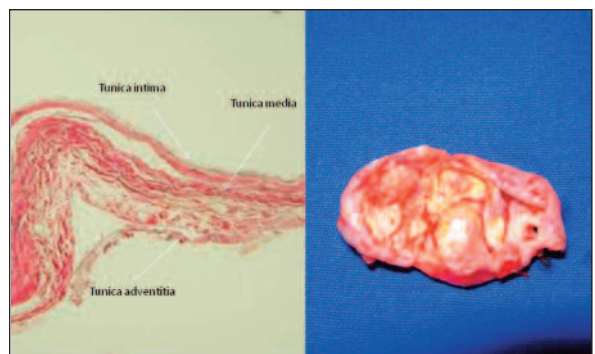


FIGURE 3: Histopathological appearance of the aneurysm sac. Hematoxylin-Van Gieson stain shows fragmentation of the elastic lamina, and marked thinning of the vessel wall (left). Macroscopic view of aneurysmatic sac's inner surface (right).

DISCUSSION

Since description initial carotid artery ligation for aneurysmal disease by Cooper in 1808,¹ current surgical modalities include resection with end-to-end anastomosis if feasible, replacement or intrapositional grafting using either autologous vein graft or synthetic grafts, and patch angioplasty.² In our case, we performed aneurysm resection and end-to-end anastomosis. The differential diagnosis must include carotid body tumor, enlarged lymph nodes, neck tumors, pseudoaneurysm of carotid artery, and a redundant or kinked carotid artery. Diagnosis of a non-pulsatile thrombosed aneurysm might be difficult.³ Hyperextension and rotation of the neck can cause compression of the internal carotid artery on the transverse processes of the cervical vertebrae, and formation of a pseudoaneurysm. In addition, pseudoaneurysm of carotid artery can occur after penetrating or blunt trauma and carotid endarterectomy. Formation of a pseudoaneurysm is rare after carotid endarterectomy, with a reported frequency of 0.3 %.⁴

In many articles, primary ligation has been reported as the most appropriate option especially in ruptured cases. A stroke risk of 0.9 % has been reported during conventional surgical treatment, but this risk is higher after primary ligation. However,

cranial nerve damage has been reported in 44 % of the cases.^{4,5} Therefore, histological examination of the aneurysm wall shows not only fragmentation of the elastic lamina, but also marked thinning of the vessel wall. There was no evidence of infection or other specific pathologies, and this was considered diagnostic of an uncomplicated true aneurysm of the ECA.

In the large series,^{5,6} surgical treatment of these aneurysms has been reported as a safe and effective method associated with major stroke or mortality (4% and 9%, respectively). However, the incidence of postoperative cranial nerve dysfunction ranged between 6-44%, and some authors preferred less invasive treatment options such as coil embolization or endovascular repair of the aneurysm. Currently, there is little information in the literature about endovascular repair of carotid aneurysms due to risk of cerebral embolization.

This unusual case was successfully treated by applying the principles of routine surgery, and we are pleased to report that there are no complications after two years of follow up.

Conflict of Interest

Authors declared no conflict of interest or financial support.

REFERENCES

1. Cooper A. Account of the first successful operation performed on the common carotid artery for aneurysm. *Guys Hosp Rep.* 1836;53-9.
2. Blanco E, Serrano FJ, Reina R, Martín A, Moñux G, Ponce A, et al. Saccular aneurysms of the extracranial internal carotid artery. Experience and review of the literature. *J Cardiovasc Surg (Torino)* 2008;49(1):73-8.
3. Forbes TL, Nie RG, Kirk Lawlor D. Saccular Aneurysm of the Extracranial Internal Carotid Artery. *EJVES Extra* 2003;5(4):49-51.
4. Rana NR, Hodgson KJ, Ramsey D, Johnson CM. Management approach to an extracranial internal carotid artery aneurysm. *J Vasc Surg* 2013;57(2):526.
5. Nordanstig J, Gelin J, Jensen N, Osterberg K, Strömberg S. National experience with extracranial carotid artery aneurysms: epidemiology, surgical treatment strategy, and treatment outcome. *Ann Vasc Surg* 2014;28(4):882-6
6. El-Sabrou R, Cooley DA. Extracranial carotid artery aneurysms: Texas Heart Institute experience. *J Vasc Surg* 2000;31(4):702-12.