CASE REPORT

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Extracranial internal carotid artery aneurysm: Surgical approach

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ABSTRACT

Extracranial internal carotid artery (EICA) aneurysms constitute a significant clinical concern and are exceedingly rare. The most concerning major complications are rupture and thromboembolism. Treatment options for extracranial carotid artery aneurysms include open surgery, endovascular interventions, and non-operative approaches. Although endovascular interventions have gained popularity, surgical treatment: Complete removal of the aneurysm sac and arterial reconstruction still remains relevant. In this article, we will examine a patient with an EICA aneurysm who has been followed up with medical treatment for years. We will discuss the successful interposition of the aneurysm sac with a polytetrafluoroethylene graft following aneurysmectomy.

Keywords: Carotid artery aneurysm, extracranial, internal carotid, surgical reconstruction, endovascular intervention, stent-graft.

Extracranial internal carotid artery (EICA) aneurysms are exceedingly rare, constituting less than 1% of all peripheral artery aneurysms. They are most frequently located near the carotid bifurcation, with the second most common site being the mid-region of the internal carotid artery (ICA).[1] The primary etiological factor is atherosclerosis, particularly in elderly patients. Less common causes include previous carotid surgery, trauma, radiation exposure, fibromuscular dysplasia, and infection.[2] Although EICA aneurysms are often asymptomatic and found incidentally, they can present more symptoms than intracranial aneurysms. Common symptoms include a pulsatile mass, signs of compression on surrounding tissues and cranial nerves, and neurological complications such as transient ischemic attack and stroke. The most concerning complications are rupture and thromboembolism. Although endovascular interventions have gained popularity, surgical treatment: Complete removal of the aneurysm sac and arterial reconstruction still remains relevant. Other treatment modalities include endovascular options and medical management, which encompasses regular follow-up for asymptomatic patients, strategies to prevent aneurysm sac growth, and antithrombotic therapy.

This article examines a case involving an EICA aneurysm in a patient who underwent ICA reconstruction following aneurysmectomy.

In this case report, patient anonymity was preserved and written informed consent was obtained from the patient after informing them about the scientific use and publication of the case details.

CASE REPORT

An 81-year-old woman was admitted to the hospital with a neck mass that has been monitored for 4 years and has exhibited progressive growth. Diagnostic tests indicated a 7x8 cm pulsatile mass in the left cervical region of the carotid artery, which expands during systole (Figure 1).

The patient was diagnosed with an EICA aneurysm and subsequently underwent surgical intervention. Under general anesthesia, a precise incision was made in the skin and subcutaneous tissue at the location of the left carotid artery. The aneurysm sac was meticulously dissected from the surrounding tissues, ensuring the preservation of vascular and nerve structures. The common carotid artery and external carotid artery were explored and secured with tape. Following heparin administration, a clamp was applied to the common carotid artery, and the aneurysm sac was opened, with continuous electroencephalogram (EEG) monitoring in place. The ICA was identified at the distal end of the aneurysm, which was occluded using a carotid shunt, allowing for effective bleeding control. One end of an 8-mm ringed polytetrafluoroethylene (PTFE) graft was anastomosed end-to-end to the distal ICA. The shunt was then removed, and a clamp was placed over the graft. The other end of the graft was subsequently anastomosed end-to-end to the healthy carotid tissue at the bifurcation level (Figure 2). Upon releasing the clamp, the aneurysm sac was wrapped around the graft. There were no EEG changes noted during the procedure, and no complications were

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observed. Carotid clamp time was 19 min. The patient was successfully awakened in the operating room and extubated. In the postoperative period, anticoagulant treatment was performed with subcutaneous low molecular weight heparin and antiaggregant treatment with aspirin and clopidogrel. The postoperative period was uneventful and the patient was discharged on the third postoperative day without any neurological complications and with stable parameters.

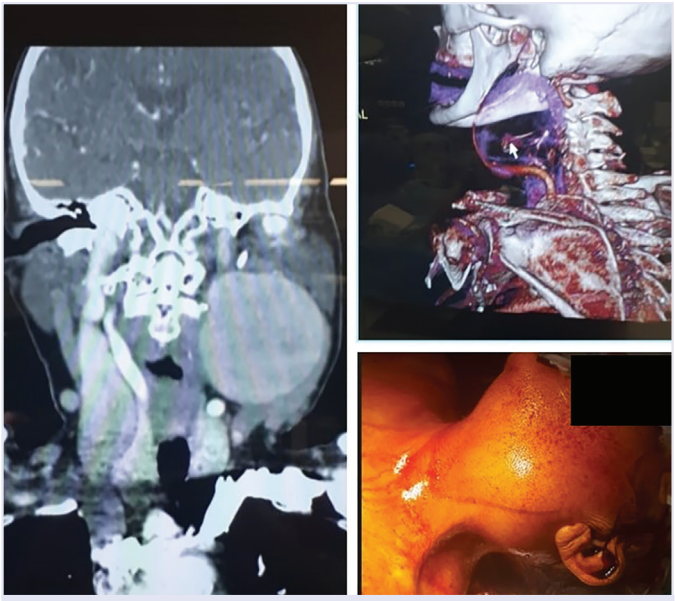

Figure 1. An aneurysmal mass is noted in the left cervical carotid region.

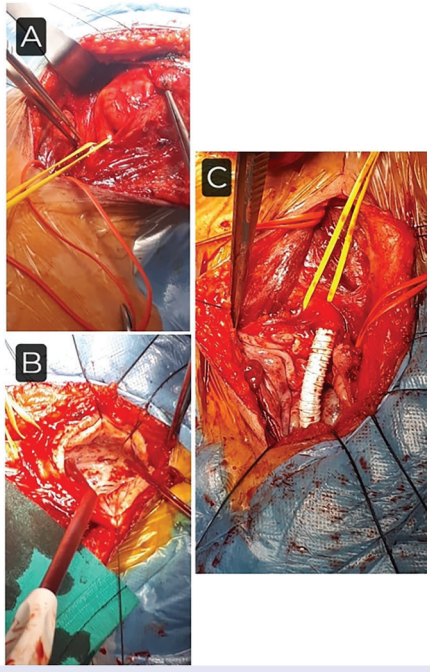

Figure 2. (A) The skin and subcutaneous tissue were incised in the left cervical carotid region, and the aneurysm sac was dissected from the surrounding tissues for thorough exploration; (B) The aneurysm sac was opened, and suspension sutures were applied to the sac wall, revealing the absence of thrombus within the sac; (C) Following the aneurysmectomy, an 8 mm ringed PTFE graft was interposed in the left internal carotid artery.
PTFE: Polytetrafluoroethylene.

DISCUSSION

Carotid artery aneurysms were initially managed with proximal ligation. Subsequently, cases emerged involving end-to-end anastomosis following aneurysmectomy and later, the use of prosthetic grafts. Currently, treatment options for extracranial carotid artery aneurysms encompass open surgery, endovascular interventions, and non-operative methods. Since the advent of open surgical treatment for EICA aneurysms in 1805, surgical techniques have progressed; however, open surgery has consistently been the preferred approach for this condition. Despite advancements in endovascular interventions, open surgery remains the standard of care. The primary objective of surgical intervention is to excise the aneurysm and restore arterial continuity. When reviewing the literature, we see that there are several approaches to the surgical treatment of EICA aneurysms: End-to-end anastomosis after aneurysmectomy, interposition with an autologous saphenous vein graft, or repair of the aneurysm using a saphenous vein patch. For small and elongated EICA aneurysms, an end-to-end anastomosis may be executed post-aneurysmectomy, or interposition may be conducted using either the saphenous vein or synthetic graft materials (PTFE or Dacron). In our case, due to the size and shape of the aneurysm sac, we opted for interposition with a PTFE graft after aneurysmectomy. One study compared five-year patency rates between patients receiving interposition with a synthetic graft versus those with saphenous vein grafts, yielding rates of 88.9% and 66.4%, respectively.[2] Another study indicated a 90% patency rate at 30 months for patients undergoing open surgery.[3] A review of the literature has identified publications demonstrating acceptable mid-term outcomes with endovascular interventions.[4] Additionally, these publications suggest criteria favoring an endovascular approach, including distal cervical ICA aneurysms, prior neck surgery, and previous neck radiation. Another study has shown that endovascular stenting in the treatment of EICAs has acceptable clinical and radiological outcomes, but prospective and larger studies are needed to further confirm the safety and long-term patency of endovascular repair.[5] Non-operative treatment is generally recommended for asymptomatic, small, and stable aneurysms, particularly in patients with significant comorbidities. This approach includes antithrombotic therapy, management of cardiovascular risk factors, and regular ultrasound monitoring.[1]

EICA aneurysms, while rare, represent a serious clinical condition due to their potential to result in severe neurological complications. The gold standard for treatment involves the removal of the aneurysm and restoration of arterial continuity. Open surgery is regarded as the first-line treatment for symptomatic and large aneurysms.

Ethics

Informed Consent: In this case report, patient anonymity was preserved and written informed consent was obtained from the patient after informing them about the scientific use and publication of the case details.

Footnotes

Authorship Contributions

Surgical and Medical Practices: A.K., S.B.; Concept: A.Y.; Design: A.Y.; Data Collection or Processing: A.Y., M.F.A.; Analysis or Interpretation: A.Y.; Literature Search: A.Y.; Writing: A.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

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REFERENCES

1. Fankhauser GT, Stone WM, Fowl RJ, O'Donnell ME, Bower TC, Meyer FB, et al. Surgical and medical management of extracranial carotid artery aneurysms. J Vasc Surg. 2015;61:389-93. doi: 10.1016/j.jvs.2014.07.092.
2. Donas KP, Schulte S, Pitoulias GA, Siebertz S, Horsch S. Surgical outcome of degenerative versus postreconstructive extracranial carotid artery aneurysms. J Vasc Surg. 2009;49:93-8. doi: 10.1016/j.jvs.2008.08.006.
3. Srivastava SD, Eagleton MJ, O'Hara P, Kashyap VS, Sarac T, Clair D. Surgical repair of carotid artery aneurysms: a 10-year, single-center experience. Ann Vasc Surg. 2010;24:100-5. doi: 10.1016/j.avsg.2009.09.006.
4. Li Z, Chang G, Yao C, Guo L, Liu Y, Wang M, et al. Endovascular stenting of extracranial carotid artery aneurysm: a systematic review. Eur J Vasc Endovasc Surg. 2011;42:419-26. doi: 10.1016/j.ejvs.2011.05.008.
5. Giannopoulos S, Trinidad E, Aronow H, Soukas P, Armstrong EJ. Endovascular repair of extracranial carotid artery aneurysms: a systematic review. Vasc Endovascular Surg. 2020;54:254-63. doi: 10.1177/1538574419895383.