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Case Report Open Access

Bilateral giant aneurysms of the carotid artery in one patient

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ABSTRACT

Extracranial carotid artery aneurysms are uncommon, life-threatening diseases typically resulting from atherosclerosis. In this case report, a 32-year-old male patient with a bilateral carotid artery aneurysm is presented. After the aneurysmectomy, Dacron graft interposition was applied to the right carotid artery. It was attempted to manage the complications that developed in the postoperative period. These patients require a more detailed and multidisciplinary approach, both intraoperatively and postoperatively.

Keywords: Aneurysms, carotid artery, giant.

Extracranial carotid artery aneurysms (CAA) are uncommon, life-threatening diseases typically resulting from atherosclerosis.[1,2] The incidence of peripheral artery aneurysms is 4%.[2] Although these aneurysms are typically asymptomatic, there is a high risk of cerebral embolism, nerve injury, and aneurysm rupture.[3]

Open surgery and endovascular treatments are the definitive treatment models. The prominence of open surgery in the treatment of carotid aneurysms reflects that the open surgery experience is considerable and endovascular treatment is in its developmental stages.[4] Standard surgical procedures involve end-to-end anastomosis and vein graft interposition.[4] In particular, aneurysms near the base of the skull make anastomosis hard, and their repair can damage nerves.[5] This shows how important endovascular therapy is with covered stents.[5] Herein, we present a patient with bilateral giant extracranial CAA successfully treated with open surgery.

CASE REPORT

A 32-year-old male presented to our clinic with pulsatile neck swelling on the right side (Figure 1). The patient had a history of a transient ischemic attack, slight mental retardation, psoriasis, and infertility but no prior trauma or neck surgery.

Computed tomography angiography revealed a right common CAA measuring 2.5 cm in width at the outflow level. More than 50% of the lumen in the distal segment of the common carotid artery (CCA) was stenotic. A 1.5-cm-wide aneurysm was found in the distal part of the left CCA (Figure 2).

The distance between the head and floor of the aneurysm permitted end-to-end anastomosis. It was decided to perform open surgery to reduce the

Figure 1. Giant mass on the right side of the neck.

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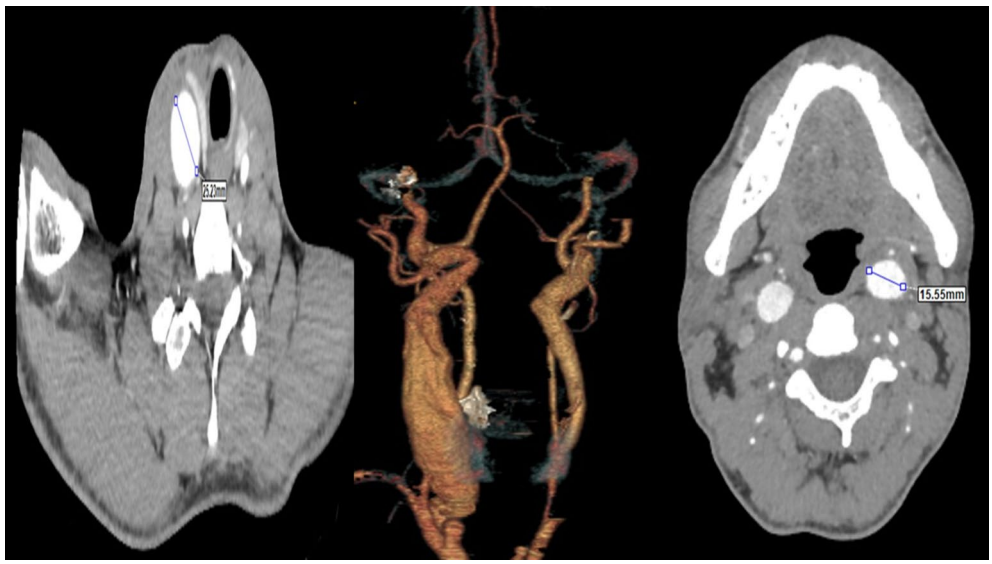

Figure 2. Aneurysm (2.5 cm) in the right CCA and aneurysm (1.5 cm) in the left CCA in computed tomography angiography.
CCA: Common carotid artery.

thrombus and the risk of a distal embolism, The shunt was not used because it was thought that cranial perfusion would be enough. During the surgery, cerebral oxygenation was monitored. The patient was draped following skin preparation under general anesthesia. The otolaryngology and plastic surgery departments explored the neck to prevent potential nerve damage and reduce tissue damage. An incision was made from the medial border of the sternocleidomastoid muscle. While protecting the cranial nerves, the aneurysm of the CCA was discovered. The aneurysm was removed after the CCA was clamped. Afterward, it was decided that both the proximal and distal parts of the CCA were long enough for anastomosis. The proximal and distal ends of the CCA were repaired with an end-to-end anastomosis using a 10-mm Dacron graft (Figure 3).

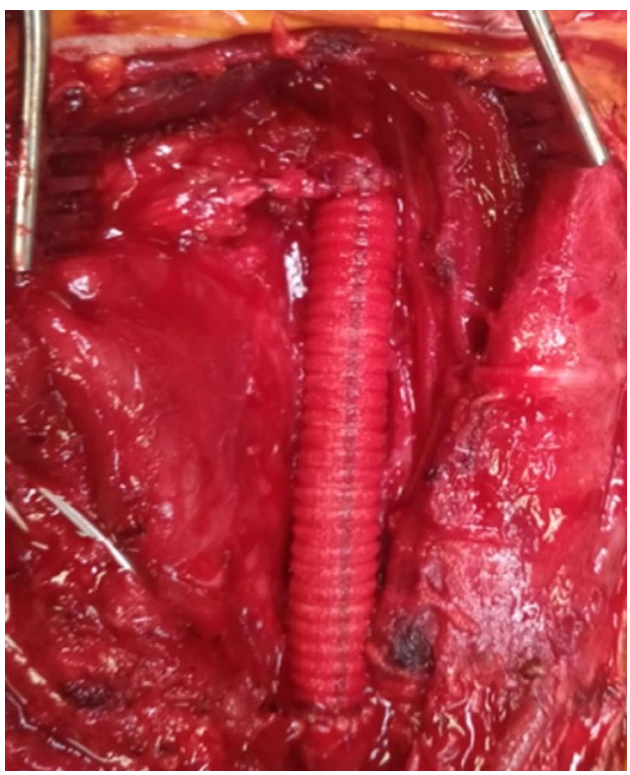

Figure 3. Final image of the Dacron graft (10 mm) after being placed.

The aneurysm wall sample was sent to the pathology department. The pathologic findings were consistent with an aneurysm, thrombus, and atherosclerosis (Figure 4). There were no fungi, spores, or hyphae.

After the operation, the patient's left upper and lower extremities did not have enough muscle tone. In the upper extremity, muscle strength was 1/5, whereas it was 2-3/5 in the lower extremity. In addition, facial paralysis was observed. Computed tomography angiography of the brain and carotid arteries showed localized embolic areas in the brain (Figure 5). On the recommendation of the neurology

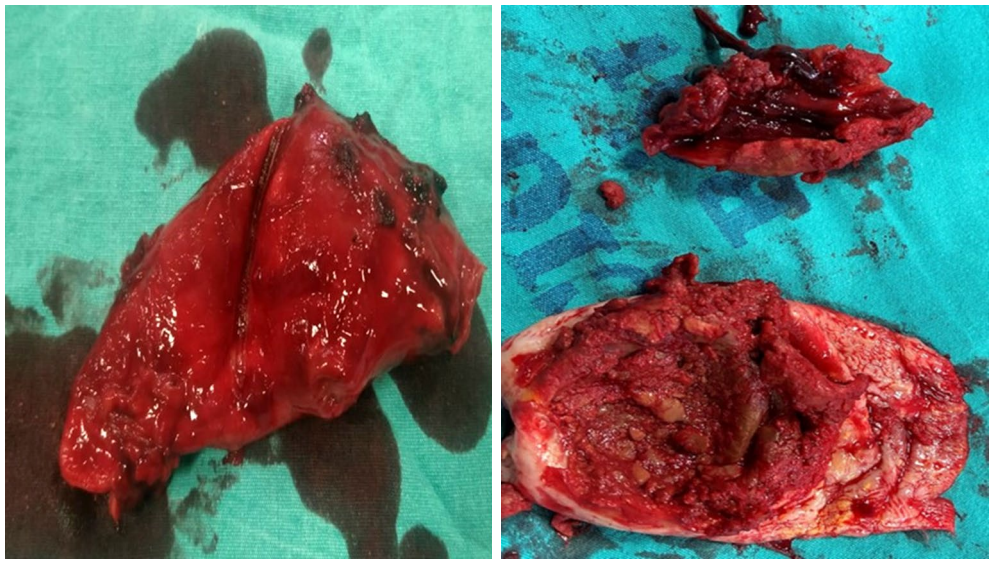

Figure 4. Excised aneurysm sac with thrombus fragments and atherosclerosis.

department, anticoagulant and mannitol medications were administered. Due to a hematoma, the patient was taken for revision, and the hematoma was removed on the second postoperative day. The rehabilitation program was implemented daily, and the patient's left-sided lack of mobility steadily improved. The patient's upper extremity muscular strength increased to 4/5, and the lower extremity muscular strength increased to 5/5. On the 14th postoperative day, the patient was released with an almost complete recovery of neurological deficits.

Figure 5. Three-dimensional carotid computed tomography angiography after the Dacron graft placement.

The left carotid artery was followed up for surgery after the patient was adequately rehabilitated. In the three- and six-month controls with the carotid computed tomography angiography, no progress was observed in the left carotid aneurysm.

DISCUSSION

The most common cause of extracranial CAA is atherosclerosis. Infrequently, connective tissue disorders, such as Marfan syndrome or Ehlers-Danlos syndrome, and infections, such as mycotic aneurysms, are also responsible.[6,7] Considering his age, our patient was young for atherosclerosis formation in the carotid artery and aneurysm formation in the bilateral common carotid arteries. A concomitant disease could not be identified, and the pathology report revealed no mycotic infections. Although a genetic test was not performed on the patient, the patient's medical history, physical examination, external appearance, and bilateral CAA suggested that a connective tissue disease (Ehlers-Danlos vascular type) might be the

cause of these aneurysms. The patient was referred to a genetic testing facility.

Excision of the aneurysm with open surgical repair is the first treatment option for carotid aneurysms. Depending on the size of the aneurysm, primary repair or graft interposition can be performed.[6-8] A less frequently used method in open surgery is carotid artery ligation. It may be done as a last resort when faced with a challenging situation due to its potentially fatal complications. A preoperative balloon occlusion test is indicated in patients with a high risk for carotid ligation.[3,4] The balloon occlusion test is a valuable screening test before carotid ligation, according to the study by Wong et al.[9] There may also be a thrombus burden in carotid aneurysms. This thrombus may result in a cerebrovascular event in patients like ours. Additionally, open surgical repair should be favored in these individuals.[6,7] The patient had a history of cerebrovascular disease, there was a thrombus in the aneurysm, and the aneurysm could not reach the base of the skull, requiring open surgical repair. The aneurysm required graft interposition for primary repair since it was too lengthy. Due to the large surface area covered by the aneurysm and the complexity of the examination, a multidisciplinary approach is necessary to avoid negative consequences. To preserve the nerves and muscles of our patient during surgery, we sought the aid of otolaryngology and plastic surgery specialists.

Huyzer et al.[10] described three patients with carotid aneurysms who underwent interposition grafts. One of these patients had a temporary paralysis of the facial nerve, and the other had a temporary paralysis of the vocal cord. After 14 months of follow-up, they discovered that all patients were alive and had no neurological deficits.

In a 15-year retrospective study, Fankhauser et al.[7] found 141 aneurysms and pseudoaneurysms. All 56% of the patients who received medical treatment did not experience aneurysm-related mortality or substantial morbidity. Asymptomatic patients were more likely to receive nonsurgical treatment (71%) than symptomatic patients (31%). This study demonstrates that some patients can be followed up with medical treatment, mainly if they are asymptomatic.

In conclusion, as extracranial CAA are associated with increased stroke incidence and mortality, they should be treated immediately. Open surgical repair should be the primary option. If the cerebrovascular event has not occurred and the patient's anatomy is acceptable, endovascular treatment may be considered for certain elderly patients with many comorbidities. Endovascular treatment will become increasingly prominent as technology advances in the following years. It should not be forgotten that asymptomatic patients and some selected patients can be managed with simple medicinal treatment. Choosing the treatment, determining the source of the aneurysm, and administering treatment for it can also prevent future complications.

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