



Carotid Aneurysm: How to Manage?

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Abstract

Background: Extracranial carotid artery aneurysms are uncommon yet serious pathology. They are mostly atherosclerotic. Treatment is mandatory for several conditions.

Case Description: A 76-year-old female presented with repeated cerebral infarctions. Computed Tomography (CT) angiography revealed a fusiform aneurysm of the left extracranial Internal Carotid Artery (ICA). Aneurysmectomy associated to a carotid-carotid venous bypass was successfully performed.

Conclusion: Open surgical treatment is the gold standard for extracranial carotid artery aneurysms. Endovascular approach could be a promising therapy.

Keywords: Extracranial carotid artery aneurysms; Surgery; Endovascular

Introduction

Extracranial carotid artery aneurysms are extremely rare, consisting about 1% of arterial aneurysms [1]. Most of them are considered of atherosclerotic etiology, but they can be caused by cervical trauma, infection, congenital anomalies (dysplasia) and connective tissue disorders such as Marfan's Syndrome. Around 50% of patients are diagnosed after the onset of cerebral ischemia [2]. Here, we present an extracranial carotid artery aneurysm case discovered by a thromboembolic complication and treated by aneurysmectomy and carotid bypass.

Case Presentation

A 76-year-old female patient presented with recurrent episodes of left stroke (2 episodes). Her medical history included diabetes, hypertension and hyperlipidemia. There was no history of cervical trauma. Physical examination revealed the presence of a left pulsatile cervical mass. No neurological deficit was found.

A CT angiography demonstrated a 16.5 mm (diameter) fusiform aneurysm of the proximal portion of the extracranial ICA (Figure 1).

A surgical approach was preferred. Under general anesthesia, *via* a left cervicotomy, the carotid dissection was performed (Figure 2).

After administration of heparin intravenously, the left Common Carotid Artery (CCA) was clamped. An aneurysmectomy was performed and a carotid-carotid (between the CCA and ICA)

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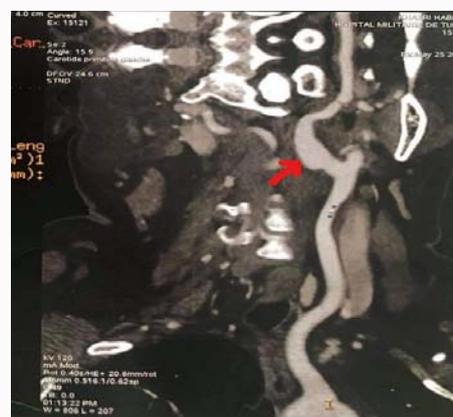


Figure 1: CT angiography showing the fusiform aneurysm of the ICA.

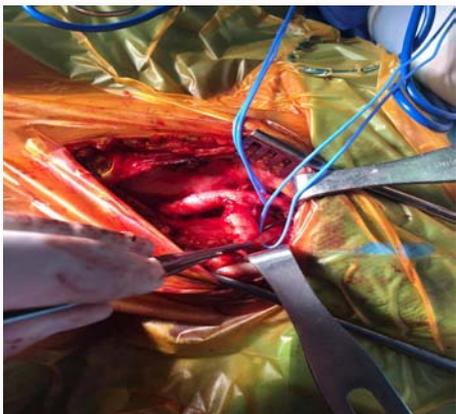


Figure 2: Control of common carotid artery, external carotid artery and ICA downstream from the aneurysm.



Figure 3: Proximal end-to-side anastomosis on the CCA.



Figure 4: Distal end-to-end anastomosis on the distal ICA (after ligation of its ostium).

venous (saphenous vein) bypass was carried out (Figures 3-5). The postoperative course of the patient was uneventful.

Histopathological examination revealed that the wall of the aneurysm undergone fibrosis, lipid deposits and atherosclerotic lesions.

Discussion

Extracranial carotid artery aneurysms account for 0.1% to 2% of all carotid procedures [3]. The treatment is generally recommended for increasing aneurysm size, diameters greater than 2 cm or after a



Figure 5: Carotid-carotid venous bypass.

complication, which was the case of our patient. The aim of treatment is preventing neurological thromboembolic episodes but also rupture and cranial nerve dysfunction [4]. Surgical, endovascular or hybrid repair have been suggested.

Open surgical intervention is the main technique of treatment for the extracranial ICA aneurysms. Options of surgical repair include, after standard exposure of the carotid artery: Excision with primary end-to-end anastomosis or excision with prosthetic or venous graft interposition [5]. However, this technique is correlated to a significant morbidity and mortality: 44% of nerve palsy, 5% of stroke and 1% of mortality [6].

Both covered stent associated with cerebral protection devices and bare-metal stents associated with coiling are served for the endovascular treatment [7]. This option is interesting if the aneurysm is highly located or when the patient has a history of anterior carotid surgery or cervical radiation.

In some cases, the anatomical features of the aneurysm and the arterial tortuosity precluded endovascular repair. Therefore, hybrid techniques may be the solution. Open surgery exposes the carotid artery and removes the anatomical abnormality, making the endovascular approach feasible [8].

Several classifications were developed to guide the strategy of treatment [9]. The Blaisdell classification, using a virtual line between the mastoid process and the angle of mandible, divides the aneurysms based on their anatomical location. More recently, the PUMCH classification, considering both the location and the proximal artery anatomy, is considered. Further studies are required to support one or another.

Conclusion

Due to the lack of clinical guidelines for extracranial carotid artery aneurysms, the selection of treatment remains challenging. In general, Open surgical repair is the treatment of choice. Endovascular approach could also be an interesting alternative.

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