Aneurysm of the Kinked Extracranial Internal Carotid Artery
Case Report and Review of the Literature

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Introduction

Aneurysms at the extracranial portion of the internal carotid artery are rare disorders. In the largest series, McCollum reported only 37 cases over a 21 year period (1) and Moreau reported 35 cases over a 24 year period (2).

This uncommon but interesting vascular disorder usually presents as a parapharyngeal pulsatile mass. It can be partially or completely thrombosed and can thereby cause embolization or compression of neuronal vasculature. Ruptures and ischaemic events are other complications. Therefore the mortality rate in nonoperated patients is very high. The major etiologic factor is atherosclerosis. Sometimes, trauma may be another cause. Surgery is recommended for symptomatic aneurysms in patients at all ages.

The aim of this paper is to report the symptoms and clinical findings of a patient with a kinked extracranial internal carotid artery with aneurysm and to review the literature.

Case report

F.U. was a 66-year-old obese woman. Since 1988, she had had a growing pulsatile mass under the right mandibular angle, in the neck region. Uncontrolled hypertension was also evident during this period. She complained of auricular pain and hoarseness. She was admitted to our cardiovascular surgery unit with a pulsatile mass at the lateral neck region with a maximal transverse diameter of 40mm. Diagnostic evaluation included colour doppler ultrasonography (USG) and computerized tomography (CT) of the neck. After execution of colour doppler USG, the diagnosis was aneurysm of the right extracranial internal carotid artery with parietal thrombosis. Diagnostic evaluation was completed with CT, which confirmed the diagnosis; there was saccular aneurysm together with a kink at the extracranial portion of the right internal carotid artery (Fig. 1). Cranial CT was also performed in order to discover any possible previous thrombo-embolic events. The result was negative.

Elective surgery was performed under general anaesthesia. After dissection of the platysma, the carotid bifurcation was isolated. We detected a saccular aneurysm of the kinked internal carotid artery. Its proximal collar was 2 cm away from the carotid bifurcation. After administration of heparin and clamping the vessels, an incision of the aneurysmatic sac was made, extending to the internal carotid artery. The aneurysmal segment was excised, followed by end to end internal carotid artery re-anastomosis, with a 6/0 polypropene suture, thereby shortening the kinked artery. Postoperative course was uneventful and the patient was discharged on the 3rd postoperative day without any problems. The patient is currently in good health.
Discussion

Extracranial internal carotid artery aneurysms are extremely rare. In the literature, reported incidence is about 0.8-1% of all arterial aneurysms and about 4% of all peripheral arterial aneurysms (3).

Most cases occur spontaneously, atherosclerosis being the main etiologic factor, the, or are caused by blunt trauma involving the neck region and high cervical portion of the internal carotid artery (4). Blunt or non-penetrating trauma, although more often the cause of thrombosis of the injured vessel, can also be associated with the development of a false aneurysm. Blunt injury to the carotid artery results in abnormalities, such as spasm, intimal and medial tears, dissection and partial or complete severance of the vessel (5). Disruption of the continuity of the arterial wall is then the main cause in producing an aneurysm.

Dissection of the extracranial internal carotid artery can also occur after a penetrating injury to the neck, or even spontaneously. About 30% of carotid dissections are associated with aneurysm formation (6). In this case the aneurysms are more often fusiform rather than saccular in form.

Symptoms of extracranial internal carotid artery aneurysms vary according to the location, size, and etiology of the pathology. Small aneurysms may be asymptomatic and are occasionally recognized as a pulsatile mass in the neck region below the mandibular angle and in the tonsillar fossa. However, most patients with extracranial internal carotid artery aneurysms are symptomatic and their aneurysms are detected as a pulsating tumour under the mandible. Regional pain is the most common local symptom, which is especially associated with facial and/or trigeminal nerve compression, or as a result of spontaneous dissection (7). Some patients may complain of retro-orbital pressure and headache (8). Dysphagia secondary to compression of the nerve supply to the pharynx is another frequent symptom. Horner syndrome can be observed. Glossopharyngeal compression can account for auricular pain. Vagal compression may cause hoarseness. On the other hand, most neurologic events are due to embolization of thrombotic material from the aneurysm wall. Thus, it is reported that ischemic attacks or strokes can occur in more than 40% of patients. Haemorrhage is a rare manifestation but, if rupture occurs, bleeding can be massive and lead to death. Mycotic aneurysms in particular have a tendency to rupture and bleed (9).

The most frequently encountered lesion to be distinguished from aneurysm is a kinked or coiled carotid artery. Typically, these lesions involve the right side of the neck in obese, hypertensive and older women. USG readily defines these lesions. Digital subtraction angiography (DSA) is the gold standard diagnostic method which gives essential information regarding the location and morphology of the pathology. Similarly, CT can also give good results.

Kinks of the internal carotid artery may be acquired or developmental. The carotid artery can be excessively long and result in redundancy and tortuosity of the vessel. Usually the internal carotid artery is affected and assumed to have an “S” shape. Kinks are four times more common in women than in men (10). The true incidence is unknown due to patients remaining asymptomatic. Symptoms are usually similar to the atherosclerotic diseases of the carotid artery, such as transient ischemic attacks, strokes, amaurosis fugax, etc. Most are due to haemodynamic abnormalities of the kinked carotid artery which causes a turbulent flow leading to intimal ulcerations and embolization.

Internal carotid artery aneurysms can be partially or completely thrombosed, so can cause distal embolization, or compression of adjacent structures, or can even be ruptured. Therefore, the mortality and morbidity rate in patients with conservative treatment is very high. However, surgical treatment prevents permanent neurologic deficits resulting from thrombo-embolism or atheroembolism and, with advanced vascular surgical techniques, mortality rates are less than 2% (11).

The preferred surgical treatment method is resection of the aneurysm with restoration of the blood flow (12). Internal carotid re-implantation, if possible, represents the best method of choice for the treatment of the aneurysmal carotid pathology. Endo-aneurysmorraphy is still useful for some saccular and mycotic aneurysms. The other surgical options include resection and saphenous vein interposition, internal carotid re-implantation to the side of the common carotid artery, and a long patch angioplasty. Recently, the application of endoluminal stents and stented grafts have also been increasingly used to treat these lesions (13, 14).

In summary, this report reviewed the literature and presented a carotid artery aneurysm together with a kink at the extracranial portion of the artery. We performed elongated resection and end to end anastomosis which is considered to be the best treatment option. Otherwise, if the patient had not been treated we might speculate that she would probably experience disabling problems or even more disastrous complications resulting from the pathology.

References


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