Endovascular coil embolization of the left internal carotid artery aneurysm – case report

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ABSTRACT: In the current case report we present a novel case of a successful coil embolization of the left internal carotid artery aneurysm. The patient presented with neck pain and a palpable pulsating tumor and was admitted to the vascular surgery clinic where an angio-CT scan of the neck was performed. Angio-CT revealed a left internal carotid artery aneurysm with a narrow neck. The patient was admitted to the department of vascular surgery where she was enrolled into endovascular coil embolization. After the procedure, control angiography showed complete embolization of the aneurysm. Three months following the procedure, doppler ultrasonography of the carotid arteries showed no demonstrable flow into the aneurysm. Six months following the procedure, angio-CT confirmed complete aneurysm thrombosis. Based on this case, endovascular coil embolization of the carotid artery aneurysms is a safe and effective method of treatment.

KEYWORDS: aneurysm, coil, tumor

ABBREVIATIONS

angio-CT – computed tomography of blood vessels
ECAA – extracranial carotid artery aneurysm
ICA – internal carotid artery
USG – ultrasonography

INTRODUCTION

The incidence of intracranial aneurysms on autopsy ranges from 0.8% to 18% [1, 2]. In the case of extracranial carotid artery aneurysm, or ECAA, it is largely unknown, and the reported corrective procedures represent only 1% to 1.5% of procedures performed for extracranial cerebrovascular disease at large reference centers. The actual incidence of ECAA is much less than 1% of all carotid artery diseases [3–5]. De Jong et al. suggested that ECAA be defined as carotid bulb enlargement greater than 200% of the internal carotid artery diameter (ICA) or greater than 150% of the diameter of the common carotid artery [6]. This rigid definition is used in many modern ECAA reports and is an aid taking cognisance of normal physiological dilation of the carotid bulb. The causes of true aneurysms include: atherosclerosis (about 90%), Marfan syndrome, fibromuscular hypertrophy, previous irradiation of the internal carotid artery, cystic medial necrosis, pseudoxanthoma elasticum, polyarteritis nodosa, congenital aneurysms. Atherosclerotic aneurysms usually occur in the proximal part of the artery, in patients aged 50–70, more often in men [7]. The causes of pseudoaneurysms are: injuries, complications after surgery, arterial wall injury due to atherosclerotic lesions, and bacterial infections. Aneurysms can compress surrounding organs such as the esophagus, trachea, and cranial nerves. They can also rupture down to the neck, throat and consequently through the skin to the outside [8]. The most common symptom with which patients report to the doctor is a slowly growing and pulsating neck lump. Most patients with carotid aneurysms suffer from high blood pressure. Carotid aneurysms should be differentiated from: angular curvature or looping of the internal carotid artery, common carotid or subclavian artery, swollen lymph nodes, peritonsillar abscess, salivary gland tumor, inflammation of the salivary gland, lateral cervical cyst, carotid body tumor, angioma, cancer (of palatine tonsil, pharynx, skin and subcutaneous tissue, thyroid gland) [8]. The basic objective in treatment of such aneurysms is to prevent the persistent neurological deficits which may result from embolism or coagulation of the aneurysm. This goal might best be achieved through reconstructive procedures with flow restoration. The choice of therapy must be sized to fit each patient and base upon the location, size and...
pathomechanism of aneurysm formation, as well as the general condition of the patient. Failure to treat internal carotid aneurysms leads to strokes in 50% of cases [7].

CASE REPORT

A 78-year-old woman reported to her family doctor with a pulsating tumor on the left side of the neck. She had a history of hypertension, impaired glucose tolerance, and a past cerebral stroke. The presence of the lesion prompted the family doctor to refer the patient to the Vascular Surgery Clinic. Computed tomography of the carotid arteries with contrast revealed a saccular aneurysm of the left internal carotid artery, dimensions 20 x 19 x 26 mm with a narrow neck with a diameter of 5 mm (Fig. 1.). The aneurysm was directed medially and inferiorly, slightly to the front; it began approximately 57 mm above the division of the left common carotid artery. Left internal carotid artery with a meandering pattern, partially tightened over the aneurysm sac.

The patient was referred to the Department of Vascular Surgery for treatment and she was qualified for endovascular treatment. Carotid angiography revealed a 22 mm-diameter saccular aneurysm of the left internal carotid artery with a narrow neck (Figs. 2., 3.).
DISCUSSION

The presented case of a large internal carotid aneurysm represents a rare cervical tumor. After palpation, each pulsating cervical tumor should be referred to the Department of Vascular Surgery as soon as possible for further urgent imaging diagnostics. Treatment of carotid aneurysms is intended to safeguard patients against serious neurological complications. The method of embolization without stenting used by ourselves is very rare [9, 10]. We found stenting too risky due to kinking and the meandering pattern of the carotid artery, and the narrow neck promoted safe coiling without the risk of falling into the lumen of the artery. The above method of treatment may be considered an effective and safe method under certain conditions. Due to the rarity of extracranial carotid artery aneurysms and the lack of prospective research into their treatment, we believe that every case report for this condition contributes to the development of knowledge. More research and observations are needed to evaluate endovascular methods in the treatment of extracranial carotid aneurysms as very effective.

Due to the patient’s age and the morphology of aneurysm, including the narrow neck, as well as the high placement, hampering the dissection of the distal segment of the internal carotid artery, it was decided to embolize the aneurysm.

After the left common carotid artery was cannulated and the Rebar 27 microcatheter was inserted into the aneurysm, it was obliterated using the Penumbra embolization coils. The following sizes were used (24 mm x 57 cm – two pieces, 18 mm x 57 cm – one piece, 14 mm x 60 cm – two pieces, packing coil 60 cm – two pieces, packing coil – one piece). Control angiography showed complete elimination of the aneurysm sac (Fig. 4.).

The procedure was uneventful, with proper maintenance of hemostasis at the injection site. The patient was released from hospital in good general condition, with the recommendation to use clopidogrel 75 mg 1 x 1 and acetylsalicylic acid 75 mg 1 x 1 for further follow-up to the Vascular Surgery Clinic. Examinations after 3 (Doppler ultrasound) and after 9 months (angio-CT) revealed complete clotting of the aneurysm (Fig. 5.).

REFERENCES
