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Case Report

True internal carotid artery aneurysm mimicking a cervical mass

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Abstract

Extracranial carotid artery aneurysms (CAAs) are exceedingly rare, accounting for less than 1% of all peripheral arterial aneurysms, with true aneurysms of the internal carotid artery (ICA) being particularly uncommon. We describe the case of a 57-year-old female who presented with a pulsatile right-sided cervical mass. Imaging studies, including ultrasonography, computed tomography angiography, and magnetic resonance angiography, identified a true saccular aneurysm of the proximal right ICA measuring approximately 2.5 cm. Due to unfavorable tortuous anatomy, endovascular treatment was not feasible. The patient underwent an open surgical excision of the aneurysmal segment with primary end-to-end anastomosis. Her postoperative recovery was uneventful, with no neurological complications, and she remained asymptomatic at 3-month follow-up. This case highlights that although rare, true ICA aneurysms carry clinically significant risks, and open surgical reconstruction remains a safe and effective treatment option when endovascular approaches are unsuitable.

Keywords: Extracranial carotid artery aneurysm, neck mass, surgical repair

INTRODUCTION

Extracranial carotid artery aneurysms (CAAs) are rare, representing <1% of peripheral arterial aneurysms, with true internal carotid artery (ICA) aneurysms comprising <10% [1,2]. Despite their rarity, CAAs carry significant risks, including transient ischemic attacks, thromboembolic stroke, cranial nerve compression, and, rarely, rupture [3]. Etiologies include atherosclerosis, trauma, infections, fibromuscular dysplasia, and connective tissue disorders. If left untreated, these aneurysms pose a high risk of thromboembolic events, progressive neurological deficits, and, in rare instances, rupture with potentially fatal hemorrhage. El-Sabrout and Cooley reported neurological complications in up to 50% of untreated cases, underscoring the importance of timely intervention [4]. Management is challenging due to anatomical complexity: open surgical repair remains the gold standard for symptomatic or enlarging lesions, while endovascular approaches, such as stent grafting or flow diversion, provide less invasive alternatives in selected patients [5]. We report a rare case of a surgically treated true extracranial ICA aneurysm and review the literature to highlight diagnostic and therapeutic considerations.

CASE REPORT

A 57-year-old female presented with a right-sided cervical mass. She had no history of cerebrovascular events or major comorbidities. On examination, a palpable, pulsatile mass was detected in the right neck, while cardiac and neurological findings were normal.

Color Doppler ultrasonography revealed a saccular aneurysm of the right ICA. Computed tomography angiography (CTA) demonstrated a tortuous proximal ICA with a 2.5 cm saccular aneurysm near the carotid bifurcation, without dissection or intraluminal thrombosis (Figure 1A). Magnetic resonance angiography (MRA) confirmed a true saccular aneurysm (24×22×24 mm) at the proximal ICA, causing mild compression of the internal jugular vein but preserving distal flow. The external carotid artery was patent (Figure 1B).

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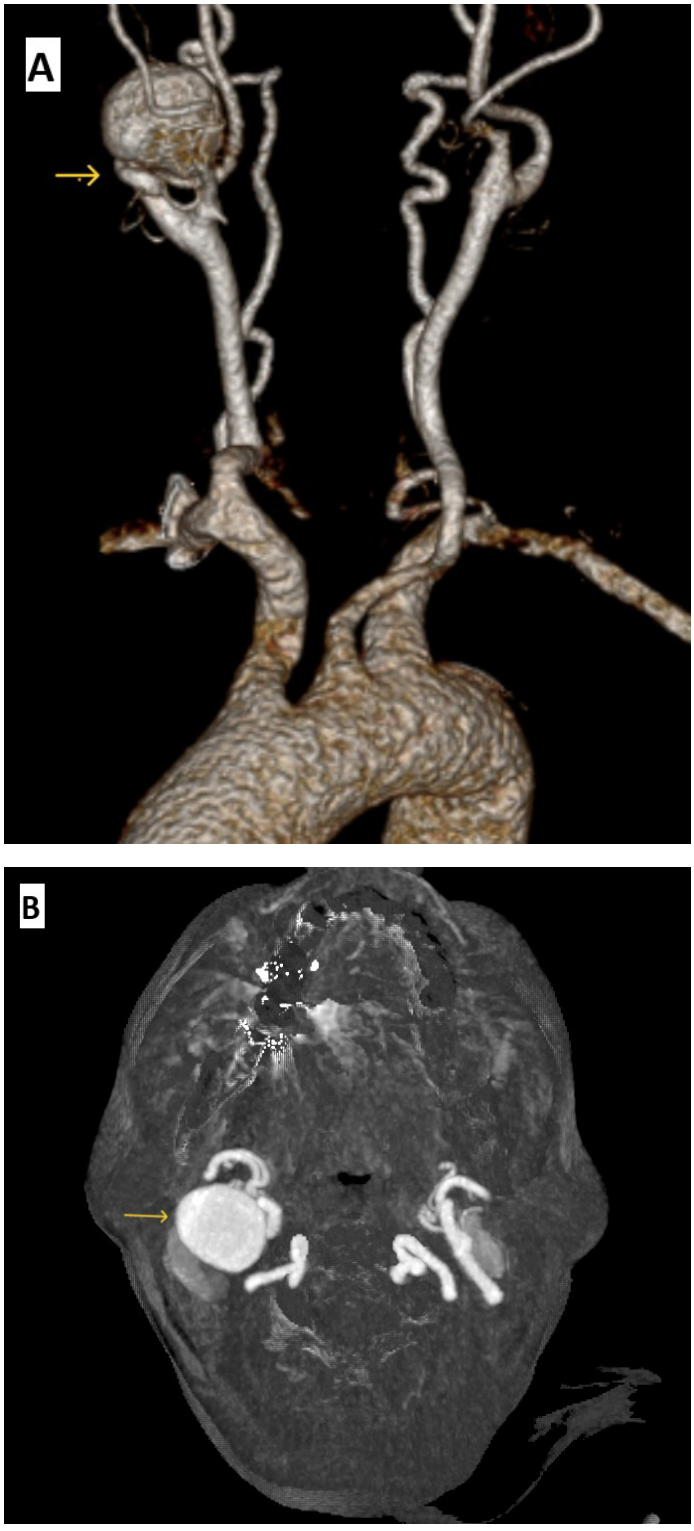

Figure 1. Preoperative imaging of the internal carotid artery aneurysm. A: Computed tomography angiography (CTA) shows the anterior view; B: magnetic resonance angiography (MRA) shows the axial view of the aneurysmal segment

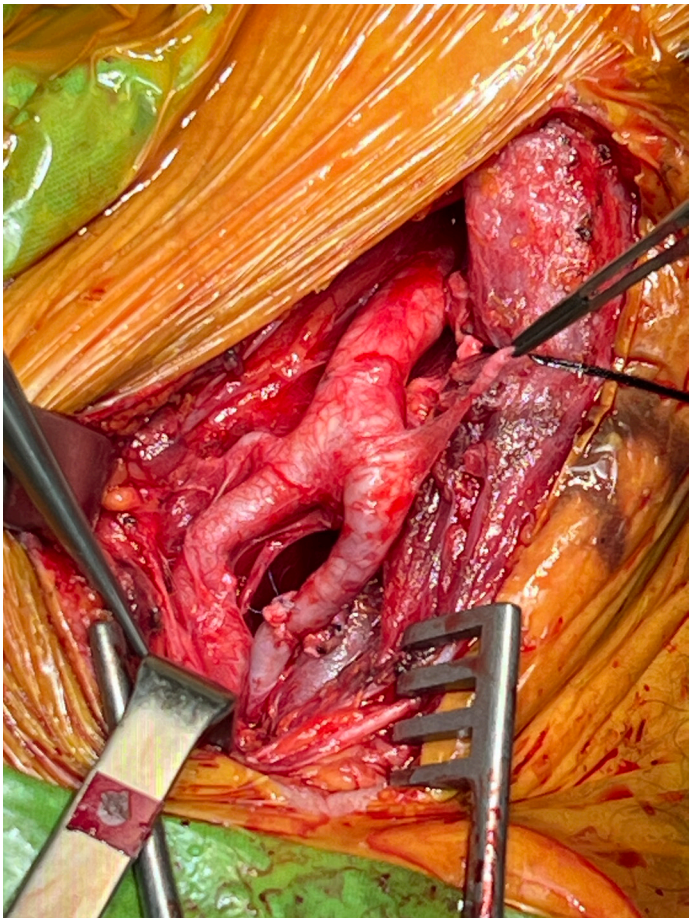

Figure 2. Surgical view of the internal carotid artery aneurysm. Left: tortuous aneurysm; center: carotid artery anatomy; right: postoperative anatomy

Procedure

The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Under general anesthesia, surgical exploration was performed. The common carotid artery (CCA), ICA, and ECA were identified and controlled along their courses. A true saccular aneurysm was observed in the ICA. The proximal segment of the ICA was tortuous and displaced inferomedially. IV Heparin 7.500 units were administered to achieve an activated coagulation time >250 s. Following systemic heparinization, vascular clamps were applied to the proximal and distal portions of the ICA. The aneurysmal segment was carefully dissected and excised. The proximal and distal ends were mobilized, and end-to-end anastomosis was performed. Cerebral perfusion was monitored intraoperatively using near-infrared spectroscopy (NIRS) and stump pressure measurements to ensure adequate collateral flow. Hemostasis was achieved with adequate intraoperative bleeding control (Figure 2).

In the postoperative period, the patient was closely monitored in the intensive care unit, extubated at 3rd hour. No neurological deficits were observed. Control Doppler ultrasonography demonstrated patency of the anastomosis site. The patient was discharged without complications on the 2nd postoperative day with acetylsalicylic acid. At the 3-month follow-up, the patient remained asymptomatic and adherent to the medication.

DISCUSSION

CAAs, though rare, carry significant risks of thromboembolism, stroke, and rupture, with true internal carotid artery aneurysms being uncommon, and while conservative management is risky, open or endovascular repair provides superior outcomes. In Attigah et al.'s 24-year series, surgical repair achieved excellent long-term results with low ipsilateral cerebrovascular event rates [6]. Our patient underwent aneurysm excision with primary end-to-end anastomosis and had an uneventful recovery. If direct reconstruction had not been feasible, interposition grafting with an autologous great saphenous vein or prosthetic graft (ePTFE, Dacron) was planned, consistent with recommendations in the literature [3,5,6].

Endovascular techniques such as covered stenting and flow diversion have broadened treatment options for high-risk or anatomically complex cases, demonstrating high procedural success and low early morbidity. However, long-term durability data remain limited, emphasizing the need for individualized treatment based on lesion morphology and patient factors [7].

In our case, the tortuous proximal ICA and inferomedially oriented aneurysm made endovascular intervention unsuitable. Open surgical repair allowed definitive exclusion of the aneurysm and preservation of cerebral perfusion, supporting the safety and efficacy of open reconstruction in anatomically favorable true ICA aneurysms.

CONCLUSION

In our patient, the internal carotid artery was tortuous, with the aneurysmal sac folding over the proximal ICA and directed inferomedially, making endovascular repair unsuitable; thus, open surgery was chosen to definitively exclude the aneurysm while preserving cerebral perfusion.

Patient Consent for Publication: Informed consent was obtained, and procedures followed institutional ethical standards.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: All authors contributed equally to the article.

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