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Successful Repeat Stenting of an Aneurysmal Lesion of the Internal Carotid Artery in a Patient with Complex Vascular History and a Bovine Aortic Arch

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INTRODUCTION

Management of stenoses and complications of the internal carotid artery (ICA) remains a frequent challenge in vascular surgery and interventional radiology. Particularly in patients with multiple prior interventions on the ICA, the risk of anatomical complexities and perioperative complications increases significantly. The prevalence of restenosis after carotid endarterectomy (CEA) is reported to be up to 15%, and the optimal therapeutic approach must be individualized. Furthermore, a rare anatomical variant - the bovine aortic arch - complicates endovascular treatment and requires careful planning and expertise.

We present the case of a 63-year-old male patient with multiple prior carotid surgeries and an aneurysmal dilation of the left common and internal carotid artery. Due to the complex anatomy and clinical history, repeat stenting was performed without embolic protection, resulting in a complication-free course and favorable clinical outcome.

Clinical Presentation and Diagnostics

On clinical examination, a palpable swelling was noted on the left neck since August 1, 2025, without neurological deficits. Duplex ultrasound suggested an urgent suspicion of an aneurysm of the left ICA.

CTA of the neck vessels revealed a bovine aortic arch with the left common carotid artery originating from the brachiocephalic trunk. Approximately 8 cm distal to the origin of the left common carotid artery, an aneurysmal dilation measuring 1.6 × 1.8 × 3.5 cm was found, extending from the common carotid into the internal carotid artery. The extra- and intracranial cerebral vessels showed unremarkable contrast enhancement.

Patient Information and History

A 63-year-old male with grade I-II obesity, bilateral peripheral arterial occlusive disease (Fontaine stage IIB), arterial hypertension, non-insulin-dependent diabetes mellitus, and hyperlipoproteinemia presented on August 5, 2025, with swelling on the left side of the neck. Risk factors included a history of smoking (~30 pack-years) until 2013, and multiple prior vascular procedures:

Left carotid endarterectomy (CEA) with patch angioplasty in 2014
Redo left carotid endarterectomy with bovine patch angioplasty on September 2, 2021
Right carotid eversion endarterectomy on October 28, 2021

Home medications included acetylsalicylic acid, rivaroxaban (COMPASS study regimen), atorvastatin, ezetimibe, amlodipine, hydrochlorothiazide, torsemide, and candesartan.

Intervention

On August 6, 2025, under local anesthesia with anesthesia standby, endovascular repair was performed via right femoral artery access. Two overlapping Viabahn covered stents were implanted (distal 5 × 50 mm, proximal 6 × 50 mm). No embolic protection device was used. No intraoperative embolism, vasospasm, or dissection occurred. A loading dose of clopidogrel 300 mg was administered intraoperatively.

Postoperative Course and Follow-Up

The patient was monitored in the stroke unit without new neurological deficits. Dual antiplatelet therapy (aspirin and clopidogrel) was continued for 6 months postoperatively, and the COMPASS regimen was discontinued.

Post-interventional ultrasound demonstrated exclusion of the aneurysm with good flow through the stents. Follow-up ultrasound was planned in 3 months.

Discussion

This case illustrates the complexity of managing patients with multiple prior carotid interventions and anatomical variants such as the bovine aortic arch. The decision to perform repeat stenting without embolic protection was justified based on the anatomical considerations and patient risk profile, leading to an uncomplicated and successful outcome.