

Original Article

Endovascular Treatment of Carotid Blowout Syndrome Due to Laryngeal Cancer: A Case Report

Christos Bekos, MBBS, MSc, PhD

Clinical Associate Professor of Vascular Surgery, Head of the Department of Vascular Surgery, Nicosia General Hospital, Cyprus

Andreas Hadjipolycarpou, MD

Resident of Vascular Surgery, Department of Vascular Surgery, Nicosia General Hospital, Cyprus

Ilianna E. Armata, MBBS

Foundation House Officer Year2, Department of Endocrinology, Bedford Hospital, Bedford, United Kingdom

Correspondence: Christos Bekos, Nicosia General Hospital, 215 Old Road Nicosia-Limassol, P.C. 2929, Strovolos, Nicosia, Cyprus. Email: b.chris@cytanet.com.cy

Abstract

Carotid blowout syndrome (CBS) is a well-recognised complication in patients with advanced head and neck cancer. Bleeding due to rupture of the carotid artery or one of its major branches, does not only occur as an acute event but can also manifest as impending or threatened blowout (Chaloupka et al., 1996). The overall incidence has been reported as up to 4.3% in patients with advanced head and neck cancer (Maran et al., 1989). In the treatment of CBS, open surgical procedures such as the ligation of the carotid artery are associated with a high mortality (40%) and devastating neurological morbidity rates (60%) (Powitsky et al., 2010). This article aims to re-examine an endovascular approach, inspecting a case of life-threatening haemorrhage caused by CBS, and its course of treatment. We detail the complex case of a common carotid artery (CCA) lesion, as well as an internal carotid artery (ICA) lesion above the bifurcation level.

Key Words: endovascular treatment, carotid blowout Syndrome, laryngeal cancer

CASE REPORT

A 62-year-old male was admitted into the ENT ward in a state of severe hypovolaemic shock. The patient had a known history of laryngeal cancer, and was admitted having suffered a massive haemorrhage of the oropharynx. Following resuscitation with IV fluids, the patient was immediately transferred to the operating theatre where his oral and nasal cavities were haemostatically packed by the ENT team. A tracheostomy tube was also placed in order to secure the patient's airway, with identification of the exact site of haemorrhage being challenging due to extensive bleeding. The patient then

underwent a CT angiogram of the aortic arch, carotid and vertebral arteries, as well as a brain scan. The Vascular Surgery team was consulted and the patient was immediately transferred to the hybrid angiographic suite for further investigation of the carotid arteries. As mentioned previously, the patient had a history of laryngeal cancer (supraglottic carcinoma, T4N2b) treated with partial laryngectomy and followed up with chemo and radiotherapy two years ago. An emergency angiography was performed. Through a 5Fr sheath using right (Rt) common femoral artery (CFA) access, a selective right common carotid artery (CCA) catheterisation was performed using an

angled catheter (Bern, Boston Scientific). Carotid digital subtraction angiography (DSA) demonstrated a pseudoaneurysm of the Rt ICA 5cm above the bifurcation (Figure 1).

The 5Fr CFA sheath was upsized to 9Fr to allow delivery of a covered stent graft. Following systemic IV anticoagulation with 5000U of heparin, a 5×25mm covered stent graft was deployed (Viabahn, W.L. Gore).

This resulted in the complete exclusion of the pseudoaneurysm and control of the acute bleeding (Figure 2). The patient was haemodynamically stable the following days in ICU.

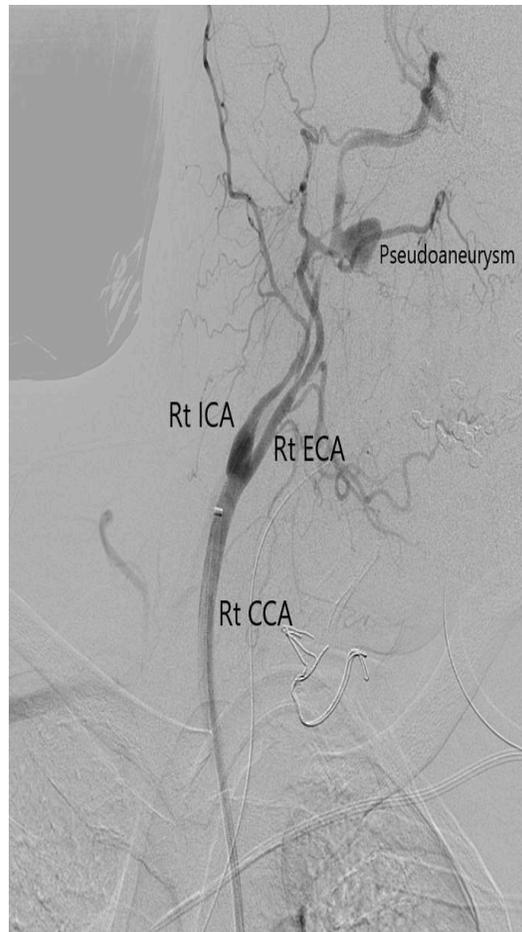


Figure 1. Pseudoaneurysm of the right ICA branches: DSA of the right ICA shows a pseudoaneurysm above the bifurcation.



Figure 2. Excluded pseudoaneurysm: DSA of the right ICA post stent graft shows complete exclusion of the pseudoaneurysm

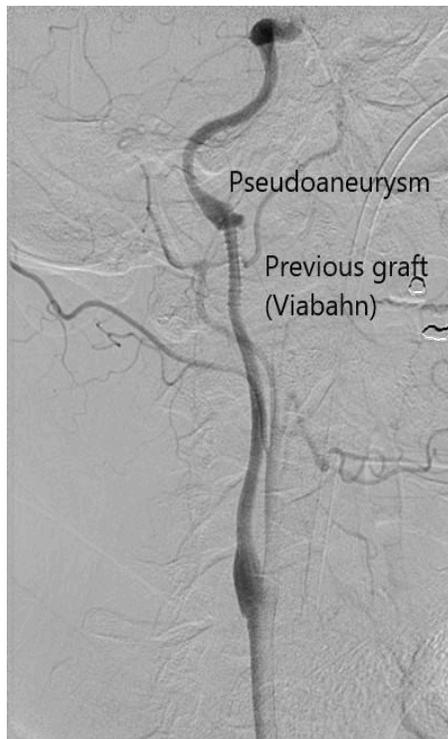


Figure 3. Active bleeding of the right ICA: DSA of the right ICA one week post stent graft insertion shows active bleeding above the graft.

Figure 4. Successful stent insertion: DSA of the right ICA post second stent insertion shows successful treatment of the acute bleeding.

One week after the initial procedure, the patient developed a recurrent haemorrhage. A new DSA revealed an active bleed from the right internal carotid artery above the previous stent-graft (Figure 3). The lesion was successfully treated with a BeGraft coronary 5×24mm covered stent (Bentley InnoMed) through a 5Fr sheath with left femoral access (Figure 4).

The patient remained in ICU for 72 hours. He was then transferred to the ward and discharged after 5 days. Follow-up examination revealed a recurrence of the initial malignancy. Due to the high risk of tumour bleeding the patient was discharged with single anti-platelet therapy and low dose low molecular weight heparin (LMWH).

Discussion

Carotid blowout syndrome refers to the rupture of the extracranial portion of the carotid artery. This clinical entity can be considered a syndrome and thus be classified into three main groups: threatened, impending, or acute carotid blowout (Chaloupka et al., 1996). Aetiology includes head and neck malignancy, radiation therapy and trauma. Surgical carotid artery ligation provides permanent therapy but this treatment option increases stroke risk, augmenting the potential for devastating neurological deficits. Patients suffering from malignancy prove challenging to perform this procedure on, as they suffer from poor tissue health due to tumour infiltration or previous neck irradiation.

Endovascular therapy of CBS nowadays can be considered the treatment of choice. Recent endovascular techniques, with the usage of stent-grafts have surpassed open surgery because they are simple, effective, and safer. The endovascular approach requires the usage of covered stent grafts with self-expanding stents being advocated over balloon expandable stent grafts. This is due to the former being able to contour to the curvature of the carotid artery with ease, decreasing the risk of possible arterial rupture. Recurrent haemorrhage following stent graft treatment of CBS in the setting of head and neck malignancy is significant and is connected to poor arterial tissue health and disease progression (Simental et al., 2003). These cases are treated by endovascular means with repeat stenting or in some cases, in which massive haemorrhage is not controllable, with vessel coiling. Reported survival rates for endovascular management are 89%, thus it is currently favored over the traditional surgical approach which is accompanied with a mortality rate of 40% (Simental et al., 2003, Ahn et al., 2013).

Conclusions

Covered stent-grafts appear to be a safer management option for acute CBS compared to open surgery, since they have a lower rate of stroke and lower percentage of neurological deficit. Nevertheless, recurrent non-fatal bleeding may occur in up to 33% of patients (Wong et al., 2017). The development of a new design of self-expandable and balloon-expandable stents with less thrombogenic materials and higher flexibility /

contour-ability is indicated to improve the results of reconstructive endovascular management.

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