

Carotid Blowout Syndrome

Presentation:

Patient is a 59-year-old man with a history of a TXN2B squamous cell carcinoma of the right neck status post right neck dissection and parotidectomy with XRT in 1993. Patient had recurrent T2N2B disease in the right base of tongue in 2001 again treated with resection including a suprahyoid pharyngotomy, right level I neck dissection, right retromandibular and retropharyngeal node dissection and completed radiation therapy in 2002. His course was subsequently complicated by a massive pharyngocutaneous fistula which was closed with a pectoralis major flap from the left in 2003. He also developed esophageal stenosis and underwent an esophageal dilatation and a Z-plasty scar release in May 2005. His surveillance PET scans have been negative with notably the last PET scan in March 2005. Patient is with a 6 month history of dysphagia and neck pain with evaluation by the Anesthesia Chronic Pain Clinic.

Patient presented after eating while at home when he suddenly began bringing up large, copious amounts of blood. This was reported to be around 400 to 450 cc of continuous, fresh blood in approximately 3 minutes duration with spontaneous resolution. He was transported to a local ER with no active bleeding. Local Otolaryngologist who has been following him for cancer surveillance noticed that he had a large clot in what would have been his previous right piriform sinus on fiberoptic exam. With suspicion for a carotid sentinel bleed the patient was airlifted to UIHC for further management with possible Interventional Radiology care.

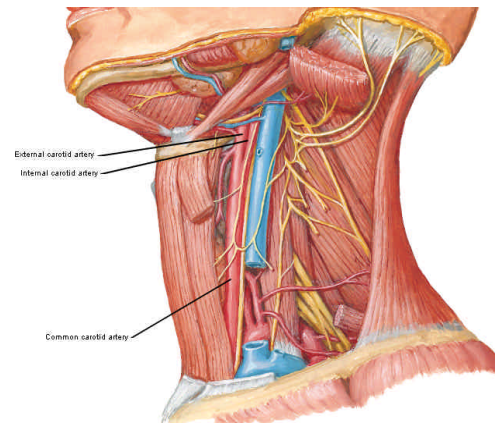
Cardiac workup was negative. Hematocrit is stable at 32 with no active bleeding. Systolic blood pressure was low in the 70's with adequate fluid resuscitation.

- Patient was taken to the Angio suite and compression at the common carotid bifurcation was noted. As this was felt to be site of bleeding, a stent was placed in the internal carotid artery and the external carotid system was coiled.
- CT was obtained upon admission which demonstrated recurrent disease in the right peripharyngeal area adjacent to his carotid system.
 - Also outpouching of pseudoaneurysm at base of right ICA 4.5 x 5 mm
- Variety of clinical scenarios – most commonly an increasingly recognized complication of aggressive primary and salvage surgery for SCCA of the head and neck.
 - The incidence of carotid rupture following radical neck dissection for malignancy is 4%, but the risks for CBS are higher following flap necrosis, wound infection, radiation to the operative bed, and recurrent carcinoma (with involvement of the carotid artery).
- First recognized in 1962; with a high mortality rate – 40%; neurologic morbidity - 60%
- Carotid blowout disease is categorized as:
 - Threatened CBS: patients with exposed carotid arteries
 - Impending CBS: patients with leakage from a pseudoaneurysm
 - Acute CBS: patients with a ruptured vessel

Must recognize that it is common for some patients to develop recurrent episodes

Recurrent CBS:

- Categorized into two main types of recurrence with varying causes:
 - Progressive disease:
 - Surgical wound dehiscence
 - Free pedicle or mobilized musculocutaneous flap necrosis
 - Iatrogenic mechanical vascular injury
 - Radiation induced arteriopathy
 - Tumor invasion of major arterial segment
 - Recurrent tumor growth and invasion into adjacent mucosal surfaces
 - Treatment failures
 - Repetitive bleeding occurring in the same arterial segment treated endovascular repair or with open surgery
 - Period between events was short, usually 1-10 days
- * 65% of recurrent events were due to progressive disease.



Treatment:

- Ligation of the common carotid artery without provocative testing was once the primary modality of treatment; its unacceptable rates of neurologic morbidity provided the impetus for investigators to search for alternate therapeutic strategies
- complications (e.g., thromboembolic stroke, hypotension and reflex bradycardia, iatrogenic rupture of the carotid artery, and iatrogenic pseudoaneurysm formation)

Osguthorpe and Hungerford described endovascular management of CBS with balloon occlusion in 1984 - Treating a wide-necked aneurysm with only a balloon can result in only a partial patency and can thus place the patient at risk for recurrence.

Preoperative permanent balloon occlusion of an internal carotid artery in patients with advanced head and neck cancer has been described for those with impending CBS. Similarly, other authors have described balloon test occlusion followed by detachable balloon embolization or vessel ligation for these patients. With the advancement of stent-assisted coiling, carotid sacrifice might be avoidable in many cases.

Coiling of wide-necked pseudoaneurysms places the patient at risk for coil herniation into the parent vessel. The use of stents alone has been described for the treatment of pseudoaneurysms. Additionally, stent-assisted coiling has been recommended for the management of wide-necked aneurysms, complex aneurysms, and pseudoaneurysms because the stent serves as a buttress to prevent coil herniation into the parent vessel lumen

Macdonald et al recently described the use of a covered stent--a 5.8-cm Jostent (Joined International; Helsingborg, Sweden)--for the emergent treatment of acute CBS. This balloon-expandable stent is made up of polytetra-fluoroethylene material encompassed by two stainless-steel stents. They reported that the stent was successfully placed and resulted in the cessation of the hemorrhage and preservation of the parent vessel.

Endovascular therapies do provide several novel options for focused treatment that is targeted directly to the vascular defects that can cause a potentially fatal hemorrhage.

- (1.) Chaloupka JC, Roth TC, Putman CM, et al. Recurrent carotid blowout syndrome: Diagnostic and therapeutic challenges in a newly recognized subgroup of patients. *AJNR Am J Neuroradiol* 1999;20:1069-77.
- (2.) Chaloupka JC, Putman CM, Citardi MJ, et al. Endovascular therapy for the carotid blowout syndrome in head and neck surgical patients: Diagnostic and managerial considerations. *AJNR Am J Neuroradiol* 1996;17:843-52
- (3.) Target-specific multimodality endovascular management of carotid artery blow-out syndrome - Original Article - Brief Article *Ear, Nose & Throat Journal*, Feb, 2002 by Elad I. Levy, Michael B. Horowitz, Christopher Koebbe, Charles C. Jungreis