Refractory epistaxis resulting from internal carotid artery (ICA) pseudoaneurysm: A case report and review of literature.

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ABSTRACT

Objective: To describe a rare case of refractory epistaxis due to a pseudoaneurysm of the petrous ICA following radiation therapy.

Study Design: Case report and review of literature.


Case: A 54-year-old woman presented with copious right-sided epistaxis of 5-hour duration. She had sought prior treatment for recurrent unilateral epistaxis multiple times over a 3-month period and had undergone right sphenopalatine artery ligation. Her past medical history was notable for nasopharyngeal carcinoma with radiation therapy 11-years prior. MRI did not demonstrate tumor recurrence. Angiography of the right internal maxillary artery distribution revealed a pseudoaneurysm of the petrous ICA. Sequential coil-embolization of the pseudoaneurysm resolved the epistaxis.

RESULTS: ICA pseudoaneurysm is a rare sequela following traumatic facial injury, sinonasal surgery, deep neck space infection, and even more rarely following radiation therapy. A total of 116 cases of internal carotid artery pseudoaneurysm were identified in the literature review. These cases were associated with trauma (n=68), infection (n=18), iatrogenic (n=16), spontaneous dissection (n=8), radiation therapy (n=3), tumor invasion (n=2), pregnancy (n=1).

Conclusion: ICA pseudoaneurysm is an uncommon complication of XRT in patients with nasopharyngeal carcinoma. Optimal management demands rapid recognition, but prompt diagnosis of cavernous ICA pseudoaneurysm is often a clinical challenge. Because this problem is related to skull-base osteoradionecrosis, it may present as a long-term complication of radiation therapy. Otolaryngologists should be aware of this possibility in patients with refractory epistaxis and a history of previous radiation.

INTRODUCTION

More than 60% of the adult population experience at least one episode of epistaxis during their lifetime. Most cases of epistaxis occur in the anterior septal area at Kiesselbach’s plexus, or Little’s Area, which is a localized region of mucosa of the anteroinferior nasal septum supplied by branches of the hole in a blood vessel. A hematoma forms outside the arterial wall such that leaking blood is contained by the surrounding tissues while remaining in contact with the breached arterial lumen. This collection of blood may clot enough to seal the leak or may rupture the tissue enclosing it and flow freely between layers of other tissues.

Pseudoaneurysm of the internal carotid artery is a rare sequela following traumatic facial injury, sinonasal surgery, deep neck space infection, and even more rarely following radiation therapy. Skull base osteoradionecrosis is a possible long-term complication after radiotherapy for nasopharyngeal carcinoma (NPC) that may contribute to this presentation1; the disorder is characterized by bony destruction or sequestration associated with the skull base and common symptoms include foul odor, headache, and epistaxis. Angiography and endovascular embolization is an effective diagnostic and treatment modality for the treatment of ICA pseudoaneurysm, but also carries significant risks. Surgical treatment proves to be difficult due to the fibrous tissue surrounding the carotid artery as well as the fragile nature of the irradiated carotid wall.

FIGURE 1. Cerebral Angiography Image 1: A microcatheter is threaded through the femoral artery and radiologically guided to the right common carotid artery. Contrast is injected to evaluate vascular blushing of the right internal maxillary artery distribution. Images from the lateral transnasal angiogram are displayed: A) Two overlapping rhinorhinocerous are seen in the right nasal cavity. B) Otherwise, normal vasculature of the nasal mucosa.

FIGURE 2. Cerebral Angiography Image 2: Images from the AP intracranial angiogram of the right common carotid artery are displayed: A) There is an unusually shaped area of contrast stagnation at the petrous carotid artery. B) This portion of the artery appears to fill slowly and retains contrast for longer duration. The images are consistent with a 5 mm x 9 mm pseudoaneurysm which arises from the medial wall of the vertical segment of the petrous ICA. There are no intimal flaps or intraluminal filling defects consistent with either thrombus or dissection within the parent artery.

FIGURE 3. Cerebral Angiography Image 3: Treatment involves placement of platinum coils to achieve hemostasis and thrombus formation. A) The pseudoaneurysm was catheterized and GDC platinum coils were deployed into the hematoma cavity. B) Following sequential coil embolization, intervaginal angiograms demonstrate progressive thrombosis within the aneurysm dome. C) Definitive therapy involves placement of a stent across this portion of the ICA. Intraoperative stent placement is delayed for 4-6 weeks until after the resolution of the acute bleed. Definitive stent placement requires the initiation of antiplatelet therapy, which is contraindicated in the acute setting.

LITERATURE REVIEW

Traumatic injury is the most commonly associated factor associated with ICA pseudoaneurysm. Massive epistaxis following blunt craniofacial trauma should alert the operator to the possibility of traumatic (ICA) pseudoaneurysm.

Deep neck space infection, retropharyngeal abscesses, peritonsillar abscesses, invasive fungal sinusitis, and chronic otitis media have all been associated with life-threatening ICA pseudoaneurysm. Patients who present with ICA pseudoaneurysm associated with an infectious process have a notably high mortality rate with often grave complications when attempting endovascular approaches for treatment.

Cases of ICA pseudoaneurysm following malignant tumor invasion have also been reported: recurrent oropharyngeal cancer causing internal and external carotid artery. Carotid artery injury causing pseudoaneurysm is a well-known risk of angiography and endovascular therapy. In addition, biopsies of the oropharynx, mandibular plate reconstruction, transspinal surgery, tonsillectomy, tympanic membrane myringotomy, and internal jugular vein cannulation have all been associated with ICA pseudoaneurysm.

Irwin and Jacocks (2000) describe a case of ICA pseudoaneurysm during the pregnancy of a healthy 35-year-old at 40 weeks gestation. It was suggested that hemodynamic, hormonal, or other physiologic changes of pregnancy may weaken the arterial wall with increasing gestational age making pregnant women more susceptible to aneurysms.

REFERENCES