



REVIEW ARTICLE

Late Endovascular Coil Erosion of the Internal Carotid Artery into the Nasopharynx: Case Report and Review of Literature

Graham Derek Unis, MS, BA^{1*}, Basit A Jawad, MD², Ashwin Ananth, MD² and Ryan Winters, MD⁴

¹The University of Queensland, Ochsner Clinical School, New Orleans, LA, USA

²Tulane University School of Medicine, New Orleans, LA, USA

³Ochsner Medical Center, Tulane University School of Medicine, New Orleans, LA, USA

*Corresponding author: Graham Derek Unis, MS, BA, The University of Queensland, Ochsner Clinical School, New Orleans, LA, 70121, 201 Harding Street, Jefferson, LA, 70121, USA, Tel: (206)-792-6086



Keywords

Endovascular coil erosion, Nasal foreign body, Nasopharyngeal foreign body, Internal Carotid artery aneurysm

Abbreviations

EVC: Endovascular Coiling; CT: Computed Tomography; FoR: Fossa of Rosenmuller; ET: Eustachian Tube

Introduction

Oral or nasal foreign bodies are a common hospital problem within otolaryngology with an incidence which most often occurs in the pediatric population [1]. Foreign bodies in adults are fairly uncommon with people aged 50 or older making up less than 10% in one case series [1] with most representing inorganic objects. Foreign bodies of the nose in adults remain rare [1]. Removal is often straightforward and major complications are rare when dealing with nasal foreign bodies [1].

Endovascular coiling complications remain relatively uncommon with only 2.7% of patients experiencing clinically significant morbidity, most commonly either intraoperative or immediately post-operative [2]. Several cases (Table 1) [3,4] have been reported in the literature following endovascular coiling of a traumatic pseudoaneurysm presenting within 6 weeks of coiling. Others have reported this as a late complication 10 years after coiling [5].

It is important to recognize that attempts to remove

the coil in clinic may potentially result in vessel rupture, bleeding and stroke. This is in contrast with most nasopharyngeal foreign bodies, which can usually be retrieved without serious complication [1]. Treatments for endovascular coil erosion in cases reports of traumatic pseudoaneurysms have involved trimming the

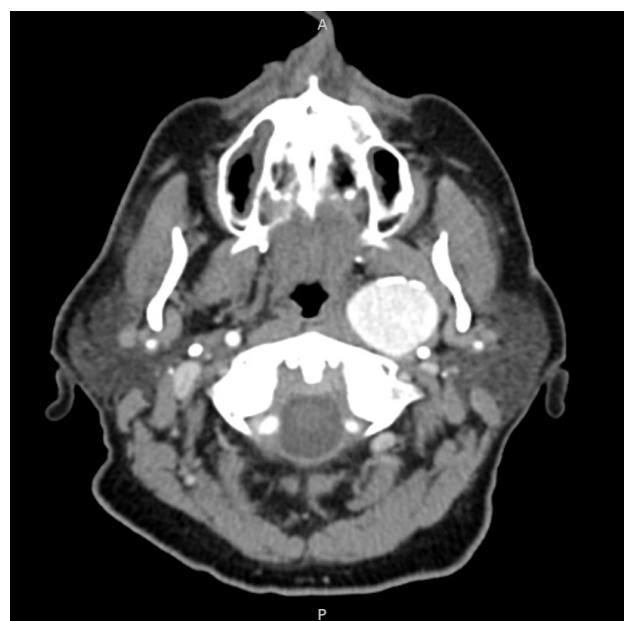


Figure 1: Contrasted CT Image, axial cut. Identification of a 3 cm saccular aneurysm of the left internal carotid artery. Calcifications suggestive of chronic disease. There is a lack of soft tissue inflammatory change seen in traumatic etiologies.



Figure 2: Pre-coiling digital subtraction angiography (DSA) demonstrating a 3.5 by 2.7 cm aneurysm of the cervical segment (C1) of the internal carotid artery.



Figure 3: Post-coiling digital subtraction angiography demonstrating occlusion of the aneurysm with minimal residual flow. A total of 22 Penumbra coils were deployed. Following the initial 3 coils, an Enterprise stent was deployed to maintain the patency of the vessel. After deployment of coiling 11 follow up runs were completed demonstrating progressive occlusion of the aneurysm.

extruded coil at the level of the defect while leaving the embedded portions in place [3-5]. This can be applied to endovascular coil erosion in true aneurysms as well and represents a pragmatic approach to treatment. Open surgical removal should only be considered in treatment failure.

Case Description

A 72-year-old male presented to a tertiary care academic Otorhinolaryngology clinic with a 1-month his-

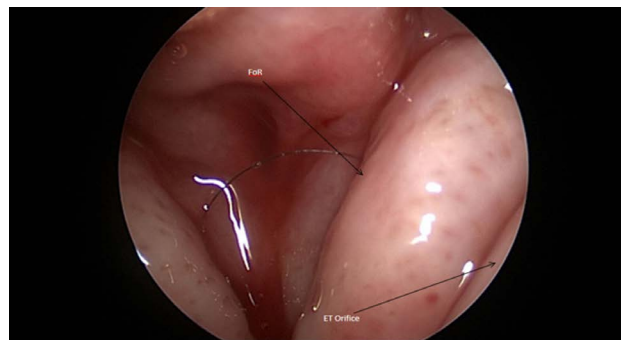


Figure 4: Platinum coil protruding into the nasopharynx from the Fossa of Rosenmuller (FoR) posterior to the eustachian tube (ET) orifice.



Figure 5: Contrasted CT image, coronal cut. Remonstration of the mass like coiling material. Metal artifact is present and interferes with determination of contrast enhancement of the aneurysm. There is close approximation within the nasopharynx and oropharynx.

tory of throat irritation. He reported recently finding a hair like object irritating his uvula that he was able to pull on and partially fracture. His past medical history is relevant for an internal carotid artery aneurysm that required endovascular coiling 6 years prior ([Figure 1](#), [Figure 2](#) and [Figure 3](#)). The physical exam was largely normal except for the nasal endoscopy, which demonstrated a thin black filamentous tissue extruding from the left Fossa of Rosenmuller ([Figure 4](#)) tracking down into the oropharynx. On contrasted CT imaging ([Figure 5](#)), a dilated left internal carotid aneurysm was present with coiling material causing local mass effect and mild narrowing of the nasopharynx and oropharynx ([Figure 6](#)).

Vascular surgery was consulted who recommended removal of the extruding filament within the nasopharynx using an endoscopic approach to reduce the potential communication with the internal vasculature. Open removal of the foreign body was reserved as a last resort given the potential significant morbidity associated with



Figure 6: 3D rendering of the left ICA aneurysm pre-coiling.

such surgery. The patient was taken to the OR. Under general anesthesia he was prepared for sinonasal surgery. Under direct visualization with a nasal endoscope, endoscopic scissors were used to amputate the filament at the mucosal junction. Post-operatively, the patient recovered without complications. Post-operative CT and angiography was ordered but never completed. On follow up examinations up to 9 months, there had been no further recurrence of symptoms, extrusion, or complications.

Conclusion

We present a case of a 72-year-old gentleman with an extruding internal carotid artery aneurysm coil through the Fossa of Rosenmuller. The patient was stable post-operatively and remained complication and progression free 8 months later at time of writing. Other reports involving pseudoaneurysms were found in the literature although no coil erosions in true aneurysms have been described. Conservative therapy with controlled amputation of the extruding filament in the

Table 1: Summary of reported patients suffering endovascular coil erosions following treatment of pseudoaneurysms of the carotid artery.

Group	Year Published	Time to Extrusion	Site of Extrusion	Material of Coil	Treatment	Follow Up	Additional notes
[6]	2003	2 years	Lateral aspect of cutaneous Neck	Platinum (Guglielmi)	Surgical removal	4 months after, stent also eroded	Radiation to neck, PA
[3]	2014	2 months	Sphenoid sinus	Platinum	Trimmed at level of defect	1 year, at 4 months, extrusion recurred following nose blowing	Sinus surgery, TPA
[7]	2019	-	-	-	-	-	-
[8]	2007	2 years	Hypopharynx	Platinum (Guglielmi)	Trimmed at level of defect	-	Aneurysm occurred post laryngectomy
[4]	2017	2 years	Oropharynx	Platinum (Penumbra 400)	Trimmed at level of defect	Recurrent extrusion at 1, 2, and 11 months	Child post tonsillectomy with TPA and endovascular coiling
[5]	2019	10 years	Naso-and oropharynx	-	Local anesthesia, Trimmed at level of defect	Recurrence at 1, 3, and 6 months	TPA following clival giant cell tumor resection
[9]	2018	18 months	Sphenoid sinus	Platinum	Local Anesthesia, Trimmed at level of sphenoid ostium	-	TPA
[10]	2019	6 months	Nasal cavity	Platinum-Tungsten alloy	Local Anesthesia, Trimmed at defect	Multiple recurrence in months after	TPA following pituitary adenoma resection
[11]	2018	3 months	Hypopharynx	-	None needed following expectorated coil	No recurrence at 6 months	Expectorated coil, Neck radiation and dissection for SCCa of tongue. TPA following surgery
[12]	2004	12 months	Pharynx and external auditory canal	Platinum (Target)	-	Recurrence at 10 months	Irradiated neck for nasopharyngeal carcinoma

Abbreviations: TPA: Traumatic pseudoaneurysm; PA: Pseudoaneurysm; SCCa: Squamous cell carcinoma.

operative room has served as sufficient treatment. Potentially catastrophic events can be avoided with the use of thorough history taking, proper imaging and judicious treatment. Long term follow-up is warranted as recurrence appears to be common (Table 1). The role of non-operative treatment and open excision is yet to be defined.

Additionally, one previously undiscussed aspect of this phenomenon is that the eroded coil served as a continued communication between a weakened aneurysm and the non-sterile nasopharynx. This environment may serve as a channel allowing the seeding of bacterial contaminants into the internal vasculature. No prior reported cases have addressed this concern. Conservative measures in cases such as these fail to address the worrisome infection risk and prophylactic anti-staphylococcal antibiotics are reasonable in the pre-operative and immediate post-operative period. Additional monitoring for prosthetic colonization and failure is likely warranted with one case report regularly following up until 6 months [5]. As endovascular coiling becomes more and more common, only time will tell if the incidence of coil erosion into the aerodigestive tract will increase. To our knowledge, this represents the only documented report within English language literature demonstrating this finding in the nasopharynx from a true aneurysm.

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Submission Declaration

This manuscript has not been submitted to any other scientific journal and the contents have never been published in any part.

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