CASE REPORT

Delayed extrusion of embolic coils into the airway after embolization of an external carotid artery pseudoaneurysm

Zachary Wilseck,¹ Luis Savastano,² Neeraj Chaudhary,^{1,2} Aditya S Pandey,^{1,2} Julius Griauszde,¹ Sumanna Sankaran,³ D Andrew Wilkinson,² Joseph J Gemmete^{1,2}

¹Department of Radiology, University of Michigan Health System, Ann Arbor, MI, USA

²Department of Neurosurgery, University of Michigan Health System, Ann Arbor, Michigan, USA

³Department of Anesthesiology, University of Michigan Health System, Ann Arbor, MI, USA

Correspondence to

Dr Zachary Wilseck,
zwilseck@med.umich.edu

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SUMMARY

Carotid blowout syndrome (CBS) is a known devastating complication of head and neck surgery. The risk of developing CBS increases in the setting of radiation therapy, wound breakdown, or tumor recurrence. Traditionally, the treatment of choice for CBS is surgical ligation of the bleeding artery; however, recently, endovascular occlusion has become a more common option. If a pseudoaneurysm is present, treatment consists of trapping with endovascular coils or occlusion with a liquid embolic agent. Delayed migration of embolization coils into the airway causing acute respiratory distress is a rare occurrence. This report presents a case of a 57-year-old woman who presented to her otolaryngologist after experiencing an episode of acute respiratory distress which resolved when she expectorated embolization coil material from her tracheostomy tube. Three months prior to the episode she underwent coil embolization of an external carotid artery pseudoaneurysm for life-threatening hemorrhage.

BACKGROUND

Carotid blowout syndrome (CBS) is seen in patients with head and neck cancer previously treated using radiation or surgical resection. The treatment options for a patient presenting with life-threatening hemorrhage include open surgical ligation or endovascular occlusion. Surgical ligation in an irradiated bed is fraught with complications and is challenging due to the fragility of the tissue. Subsequent wound healing is another major issue. Hence, when bleeding is present secondary to a ruptured carotid pseudoaneurysm in an area of previous surgical resection or an irradiated tumor bed, endovascular occlusion has been shown to be an effective alternative to open surgery. We present a case of expectoration of a coil massthree months after treatment of an external carotid artery pseudoaneurysm for a CBS.

CASE PRESENTATION

A 57-year-old woman was presented with a right lateral tongue squamous cell carcinoma which was treated with a right partial glossectomy and adjuvant radiation therapy. The patient subsequently developed a recurrence of invasive moderately differentiated keratinizing squamous cell carcinoma

involving the hyoid bone to the true vocal cords with extension into the right prevertebral space that was treated with further chemoradiation. Three years later, the patient developed a hypermetabolic mass on positron emission tomography scan involving the right palatine tonsil and glossotonsillar sulcus with contralateral metastatic disease to a left level IIB lymph node. Biopsy revealed invasive moderately differentiated keratinizing squamous cell carcinoma necessitating a further course of radiation. Six months after the completion of stereotactic body radiation therapy, the patient presented with spontaneous bright red blood from her oral cavity, tracheostomy, and right lateral abscess tract. Contrast enhanced CT of the neck showed a right-side oropharyngeal-cutaneous fistula with extension through the right tongue base. A 5 mm focal outpouching of the external carotid artery was noted along the superior aspect of this fistula. Right external carotid angiogram confirmed a 5 mm pseudoaneurysm originating from the proximal external carotid artery at the origin of the lingual and facial artery trunk (figures 1–4).

TREATMENT

The pseudoaneurysm was occluded by placing coils within the midportion of the facial and lingual

Figure 1 Coronal contrast enhanced CT shows a pseudoaneurysm (black arrow) in the right posterior oral pharynx with adjacent air in the subcutaneous soft tissues.

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Figure 2 Oblique right external carotid angiogram shows a pseudoaneurysm at the origin of the right facial/lingual artery trunk (black arrow).

arteries distal to the pseudoaneurysm and extending the coils across the pseudoaneurysm into the main proximal trunk of the external carotid artery.

Repeat angiography demonstrated occlusion of the pseudoaneurysm. During the hospitalization, the patient continued to have purulent drainage from her right lateral neck abscess and cutaneous fistula. Given the fistula was contiguous with the pseudoaneurysm, the patient was placed on a 6-week course of intravenous Ertapenem (Invanz, Merck & Co, Whitehouse Station, New Jersey, USA) and transitioned to Amoxicillin-Clavulanate (Augmentin, GlaxoSmithKline, Philadelphia, Pennsylvania, USA).

Figure 3 Lateral right common carotid angiogram shows a coil mass within the pseudoaneurysm (black arrow) with occlusion of the right external carotid artery just above the origin of the right superior thyroid artery.

Figure 4 Photograph of the expectorated coil embolization material.

OUTCOME AND FOLLOW-UP

Three months later, the patient had an acute episode of respiratory distress, coughing, and the sensation of having a foreign body in her tracheostomy. During this episode, the patient expectorated a portion of embolization coil from the prior pseudoaneurysm treatment. Following this, her respiratory symptoms resolved. She presented to the Otolaryngology clinic two weeks after this event with the extruded embolization coil material. At six month follow-up, wounds in the neck were healed and no further hemorrhage was noted.

DISCUSSION

Chaloupka *et al* defined carotid blowout as a syndrome with three subtypes: exposed carotid artery, impending carotid rupture, and acute carotid blowout.¹ Rupture of the carotid artery can result in active hemorrhage into the airway, pseudoaneurysm formation, or arteriovenous fistula formation.² Morbidity and mortality following a CBS has been reported as high as 60% and 40%, respectively.³ The affected arteries vary; in 1982 Razack *et al* reported 64 cases of carotid blowout, although, no cases involved the external carotid artery or its branches.⁴ However, Citardi *et al* reported 18 cases; 14 of which occurred in the external carotid artery.⁵

Predisposing factors of arterial wall weakening include radiation therapy, wound breakdown, surgical removal of tissue with resultant desiccation, or tumor recurrence. In this case, radiation therapy caused obliteration of the vasa vasorum, weakening the arterial wall, with a subsequent sentinel bleeding event and detection of a pseudoaneurysm. Patients with head and neck cancer treated with radiation have a 2.6%–10% incidence of CBS.³ Reports have shown an incidence of CBS in patients

Learning points

- ▶ The incidence of Carotid Blowout Syndrome (CBS) has increased due to more aggressive treatment regimens for head and neck malignancies.
- ▶ Migration and expectoration of embolization coils after embolization of an external carotid artery pseudoaneurysm is rare, but can occur.
- ▶ Operators managing CBS should be aware of this entity to help prevent devastating consequence like potential airway occlusion or recurrent hemorrhage.

who underwent surgical procedures for head and neck cancers ranging from 2.9% to 4.3%.⁶

Coil migration is a rare delayed complication of coil embolization for a pseudoaneurysm and has been described in the bronchus, stomach, and transcutaneous in a prior irradiated neck.⁷ Coil migration into the airway could lead to hypoxia and respiratory arrest if not quickly removed. In this setting, serial imaging and close clinical follow-up should be considered to detect and possibly treat coil migration. While limited data exists regarding imaging follow-up, Chang *et al* recommends follow-up within the first month than every 2–3 months after using contrast enhanced CT, CT angiography, or conventional angiography.⁸

Competing interests None declared.

Patient consent Obtained.

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