

# Carotid aneurysms: unusual referrals from general dental practice

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## Key points

Discusses an uncommon presentation in general dental practice.

Provides insight into the pathway following an urgent suspected cancer referral.

Develops a systematic approach to differential diagnoses.

Oral and maxillofacial surgeons carry out the diagnosis and treatment of diseases affecting the mouth, jaws, face and neck. They provide a critical referral service for dentists in general practice, with the most suspicious of these being sent as 'urgent suspected cancer', or 'USC'. According to national guidelines, such cases must be seen within 14 days. In January and February 2017, the oral and maxillofacial team in Morrision hospital received two such referrals from separate GDPs in the locality. Both were prioritised and seen within the two week window on consultant clinics. These two cases presented as enlarging, firm and painful neck swellings in otherwise relatively healthy adults, with no classical risk factors for malignancy, such as smoking, high alcohol intake or HPV virus. There was no dental pathology noted in either. Following clinical examination and special investigations within the OMFS department in Morrision Hospital, both patients were diagnosed, and treated under the vascular surgical team via surgical repair for carotid aneurysms. This is a condition rarely considered by dentists, and an uncommon differential diagnosis of a neck lump.

## Background

General dental practitioners are well trained and adept at recognising a wide range of pathology presenting as neck lumps. These two cases highlight an unexpected diagnosis within this broad anatomical site, both picked up through routine dental examination.

## Learning objectives

- To appreciate the importance of a reproducible 'surgical sieve'
- To become familiar with the key clinical features of carotid aneurysms
- To recognise the management pathway and the multidisciplinary care provided by oral and maxillofacial, and vascular surgeons.

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## Case description

### Case A

A woman in her late 50s (patient A) had a one-month history of a tender, enlarging swelling beneath the left angle of mandible. She had no dental pathology, and no recent weight loss, night sweats, exposure to TB or lymphadenopathy. The swelling did not vary in size throughout the day. Medically she suffered from chronic facial pain, depression and tinnitus, and was taking citalopram. On examination she had a large, firm pulsatile mass beneath the left angle of mandible, as seen in Figure 1. This lesion was deep seated and free from the skin.

### Case B

A second lady (patient B) in her mid-50s presented with a two-year history of an increasing large swelling of the right neck, which was also firm, and non-mobile. She had a 5 cm × 4 cm pulsatile mass in the right parotid and submandibular region, clinically deep to sternocleidomastoid muscle and free from the skin.

## Differential diagnosis

When approaching the diagnosis of any condition, having a systematic and reproducible approach is preferable.

Firstly, obtaining an accurate description of the lesion is essential. Table 1 highlights which aspects of a lesion should be included, whilst using the two cases as examples.

Following a good description of the lesion, the differential diagnoses can be narrowed down through the use of a surgical sieve.

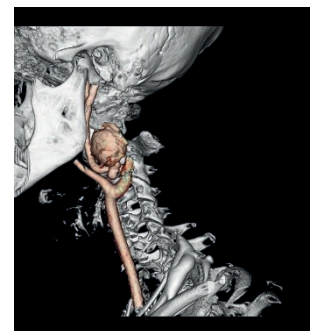


Fig. 1 3D reconstruction from CT of patient A

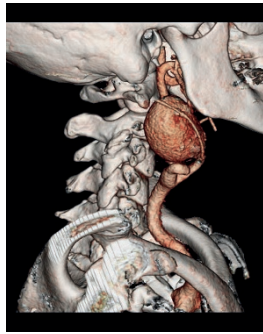


Fig. 2 3D reconstruction from CT of patient B

The term 'surgical sieve' is commonly used, particularly within the training of medics and dentists, to describe a useful mnemonic used to remember a diagnostic framework. VITAMIN is one such mnemonic picked up throughout the authors training, used here as a useful illustration; it is important to note that there are many such as this, varying between different schools and centres.

Congenital conditions are the first to be considered. A common example of this are Branchial cysts, a lymphoepithelial cyst present from birth, usually noticed in early adulthood. Given that in both these cases the neck lumps were new and discovered well into adult life, these conditions were ruled out of the possible diagnoses.

The following mnemonic gives a useful outline then of acquired diseases:

- Vascular: carotid aneurysms, or carotid body tumour: A malignant neoplasm that is slow growing, locally invasive and can metastasise. It is the only other anterior triangle neck lump to transmit pulsation from the carotid
- Infective/inflammatory: there are a wide range of such conditions, which commonly will also cause lymphadenopathy. For example these may bacterial, such as salivary gland infection, dental abscess or TB, or viral such as Epstein-Barr or cytomegalovirus
- Traumatic
- Autoimmune: systemic lupus erythematosus, sarcoidosis and rheumatoid arthritis
- Metabolic: thyroid gland enlargement. Notably occurs in the midline and therefore easily ruled out in this case
- Iatrogenic/idiopathic
- Neoplastic: malignant and non-malignant growths such as salivary gland tumours, lipomas or metastatic lesions.

Table 1 Describing a lesion

	Case A	Case B
Site	Left anterior triangle of the neck	Right anterior triangle of the neck
Size	3 × 3 cm	5 × 4 cm
Colour	Normal overlying skin	Normal overlying skin
Texture	Firm, free from skin, pulsatile	Firm, non-mobile and free from the skin, pulsatile
Duration	1 month and enlarging	2 years and enlarging

The key descriptive detail of these lesions was that they were both pulsatile, often pathognomonic for vascular lesions related to the carotid when situated in the neck.

Having narrowed down the differential diagnosis using a thorough history of the lesion, and clinical examination, it is important to conduct appropriate investigations.

This can involve biopsy, or a range of radiography investigations. Given the likely differential, any form of biopsy was clearly inappropriate. Following discussion with the vascular team at Morrision hospital, both underwent MRI, ultrasound and CT scanning, as seen in Figures 1 and 2.

### Treatment

Both patients were planned for and treated with an excision and repair with re-anastomosis of the carotid artery following referral to the vascular surgical team.

Both patients recovered well post-operatively with patient A even being discharged home the day after surgery. Follow up was arranged six weeks post-operatively.

### Discussion

Any arterial vessel which is enlarged by 50% or more, is described as aneurysmal. This can be caused by trauma, infection and weakening of the arterial wall.

Factors such as smoking, increasing age, hypertension, atherosclerosis, connective tissue disease and a family history of the condition all increase the risk status of an individual.

It is important to note that they are rare, and account for less than 1% of all arterial aneurysms. They can involve the common carotid, external and internal carotid arteries; the latter being the most common.

They may present as an incidental finding and be asymptomatic, however, in more

advanced stages of the disease clinical symptoms of a facial swelling, hoarse voice, and dysphagia may occur. It is easy to see why this condition could be mistaken for having either an infective or malignant origin.

Thrombi can frequently form within these turbulent spaces, acting as a nidus for thromboembolic stroke.

Their management may be as simple as routine monitoring in smaller lesions, however, medical, surgical or both are often indicated. Antihypertensive and anticholesterol medications may be utilised. However, when the blood supply provided by the vessel is important, as in the case of the carotid arteries, then surgical intervention may be more often selected. This involves the excision of the lesion with either re-anastomosis or stent grafting as the most common course of action.

### Learning points

- If you palpate a pulsatile mass in the neck during clinical examination, make an immediate referral to your local OMFS unit, or the GP
- Carotid aneurysms are a rare diagnosis of a neck lump
- They are a life changing diagnosis for a patient and carry a high mortality.

### Acknowledgements

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### Further reading

1. El-Sabrou R, Cooley D A. Extracranial carotid artery aneurysms: Texas Heart Institute experience. *J Vasc Surg* 2000; **31**: 702–712.
2. Aurora Health Care. Extracranial Carotid: Artery Aneurysm. Available at <https://www.aurorahealthcare.org/services/heart-vascular/conditions/extracranial-carotid-artery-aneurysm> (accessed April 2018).
3. NICE. Head and neck cancer. Available at <https://www.nice.org.uk/guidance/qs146> (accessed April 2018).
4. UK head and neck cancer guidelines. Fifth edition. 2016.
5. Scully C. *Oral and maxillofacial medicine: the basis of diagnosis and treatment*. Third edition. Churchill Livingstone, 2013.
6. Vascular Society. Homepage. Available at <https://vascularsociety.org.uk/default.aspx> (accessed April 2018).