Self Assessment Questions in Ear, Nose & Throat Surgery

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Abstract

Ear, nose and throat conditions make up a large amount of a Medical Officer's clinical workload. The examples given here illustrate some principles that should be employed when dealing with such problems.

Question 1

You are working in a regional medical centre. A 23-year-old gunner presents with a five day history of increasing right earache. He is anxious after noting sounds in the right ear were muffled and a yellow-white discharge on his pillow after waking. He has just returned from an exercise in Cyprus. Examination of the ear canal reveals the appearances seen in Figure 1.

a) What is your initial diagnosis?

b) What is the significance of the recent foreign travel?

c) Can you reassure the patient that the treatment will be painless?

d) He presents again three weeks later with persisting symptoms. A microbiology report from his initial ear canal swab suggested he has received the correct topical therapy. Would antimicrobial resistance explain this?

e) Re-examination of his ear canal reveals the appearances in Figure 2. What is your diagnosis now and what is the management?

f) The patient is concerned about flying. What is your advice?

Figure 1: *Right ear canal partially occluded by squamous debris*

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Figure 2: *Appearance of external ear canal after topical antibiotic therapy*

Question 2

You are working in the Emergency Department of a Ministry of Defence Hospital Unit. A 19-year old male is admitted to the resuscitation room with severe left sided epistaxis. He had been playing football and was accidentally headbutted by another player. On examination the patient has a blood pressure of 90/50 mmHg and his heart rate is 112 beats per minute. He seems confused with a GCS score of 14/15 and has an obvious external nasal deviation.

a) What is your initial management?

b) What other factors might be important?

c) Direct pressure applied to both nostrils has failed to resolve the bleeding. How should you proceed?

d) The bleeding from each nostril has stopped but the patient still continues to cough up blood. What must now be considered?

e) How would you manage the nasal fracture?

f) What specific questions should you ask when investigating any nosebleed?

Question 3

You are working in a regional medical centre. A 39-year old female officer has returned from an operational tour in Afghanistan. She has

become concerned about a pigmented lesion on her left ear which has recently changed in size and shape (Figure 3).

a) What other risk factors are important in this patient?
b) How would you examine the lesion in picture below?
c) How would you organise a referral to secondary care?
d) The patient is assessed by an ENT specialist who arranges an excision biopsy. The histology shows a lentigo malignant melanoma with clear margins of 3mm and Breslow thickness of 0.6mm. What action should now be taken?
e) What are the types of malignant melanoma?
f) What is the prognosis for this patient?

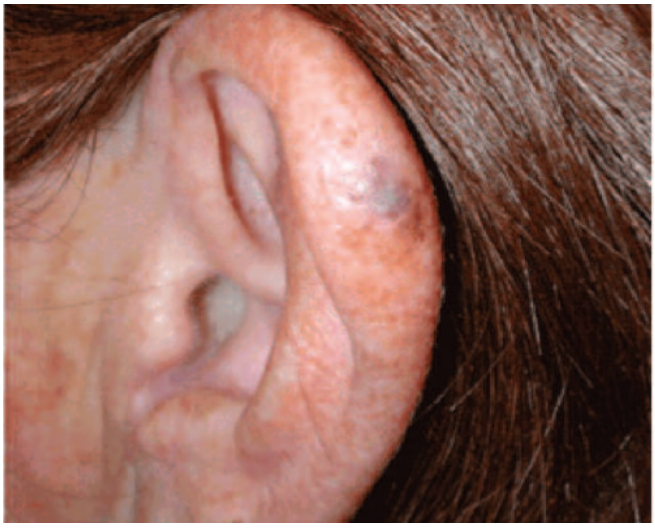

Figure 3: *Pigmented lesion on left helical rim*

Question 4

A 36-year-old warrant officer presents to the emergency department with recurrent swelling of the left submandibular gland that has lasted three months. It occurs a few times a week, usually after a meal. The swelling causes some discomfort and usually subsides after one to two hours. On examination of the submandibular area he has no obvious swelling or skin involvement. Intra-oral palpation reveals a well-defined hard mass in the left floor of mouth region. An oral cavity x-ray is obtained (Figure 4).

a) What is your diagnosis?
b) What are the treatment options?
c) Why are these patients predisposed to sore throats and poor dental hygiene?
d) What other radiological investigations are available?

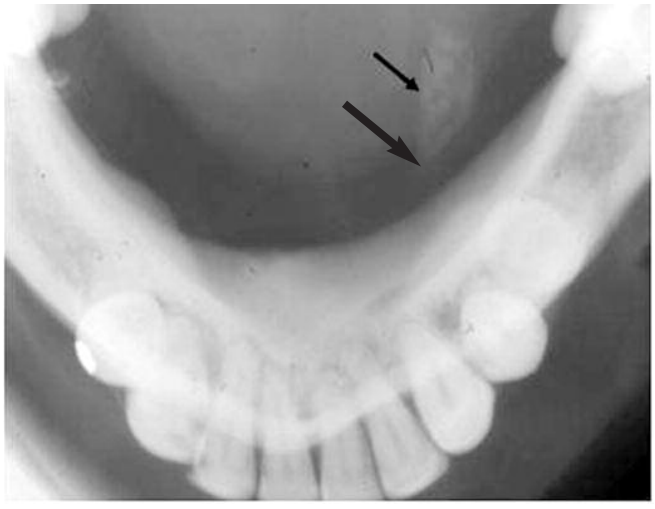

Figure 4: *Plain x-ray demonstrating an intra-oral lesion (arrowed)*

Answers to Self Assessment Questions

Question 1

a) This is a typical history of otitis externa (OE). Inflammation in the ear canal is initially itchy and then increasingly tender. As debris from the infection collects in the canal, this may result in temporary hearing impairment. An inflammatory exudate discharges from the ear. Obstruction of the canal is exacerbated by swelling of the skin lining the canal. The severity of infection is evaluated by history and examination of the canal with an auroscope (Table 1). Mild cases do not require referral to hospital and can be treated with topical steroid / antibiotic preparation for the ear [1]. In this case he has moderate otitis externa which requires microsuction clearance of the canal at the local ENT department.

Severity of OE	Characteristics
Mild	Canal skin erythema. Mild symptoms of itch / pain.
Moderate	Symptoms are significant. White squamous debris may fill a narrowed inflamed canal. Discharge may spill out of the external meatus.
Severe	The canal is completely stenosed +/- inflammation spreads on the pinna causing a cellulitis.

Table 1: *Classification of otitis externa [1]*

b) While abroad, many people swim in pools where standards of cleanliness may not be closely regulated. Dirty water in the external ear canal can precipitate infection. Other predisposing factors include eczema, hairy ear canals, psoriasis, diabetes and trauma from insertion of cotton wool buds.
c) Treatment with microsuction can be extremely uncomfortable or painful, even when performed by skilled operators. Unrealistic expectations of treatment may damage patient confidence and generate complaints. Dry mopping of the ear canal is a possible alternative if facilities are limited due to operational circumstances.
d) In this scenario, apparent failure to respond to treatment is likely to be due to failure to take ear drops as directed or adhere to water precautions (avoidance of swimming pools, insertion of vaseline soaked cotton wool or other good fitting ear plugs when in the bath or shower). Otomycosis or a hypersensitivity reaction to ear drops are two other common causes. Otomycosis is a fungal infection secondary to suppression of the normal canal flora with *Aspergillus niger* and *Candida albicans* being the two major species implicated. If hypersensitivity is suspected, a patch test may be useful. Rarely, malignant otitis externa (which is not in fact a malignancy but an aggressive osteomyelitis targeting the external ear canal) or an underlying squamous cell carcinoma can present in this manner [2].
e) The patient has otomycosis. Removing the bulk of disease with microsuction and eliminating remaining organisms with antifungal drops (e.g. Clotrimaxole 1%) is the most effective management. Treatment may need to continue until all the fungal spores germinate and are exposed to the drops, this may take up to four weeks. This complication occurs most frequently in warm humid environments.
f) In otitis externa the problem is limited to the ear canal. Air travel is only problematic if eustachian tube pathology prevents the middle ear from equalising with atmospheric pressure and so he can be reassured that flying should present no problems.

Question 2

a) Initial management is the resuscitation of the patient as a priority using a standard ATLS® protocol (Airway, Breathing, Circulation, Disability, Exposure). Ensure you have taken universal precautions by using the three Gs - goggles, gown, and gloves. Applying direct pressure to the lateral aspect of each nostril (over the cartilaginous septum) will stop most bleeds, if this simple method fails specialist help is probably required.

b) This patient was involved in blunt trauma and is displaying signs of confusion; it would be reasonable to consider cervical-spine protection even though he has significant bleeding. A CT scan of the head may be necessary to exclude an intracranial bleed.

c) If direct pressure is unsuccessful in stopping the haemorrhage and the patient is haemodynamically compromised then urgent resuscitative measures should accompany nasal packing. This requires a headlight, forceps, a nasal tampon such as a Merocel pack and lubricant jelly. The floor of the nasal cavity extends horizontally so any pack should be advanced in this manner, ensuring that the tampon goes all the way into the nose (Figure 5). The other side should also be packed with the tampon strings taped to the cheek and a nasal bolster (plain gauze pad) applied to the external aspect of the nose [3].

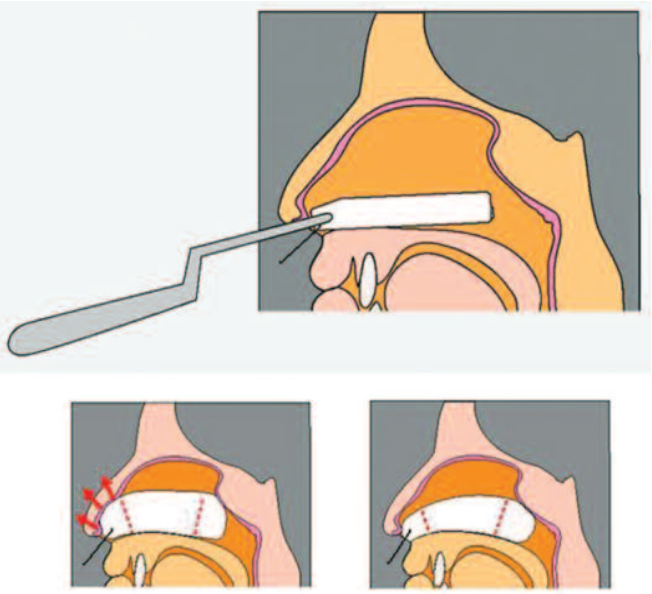

Figure 5: *Diagram illustrating insertion technique for a nasal tampon. Note the string attached to each pack should be secured to the the ipsilateral cheek.*

d) Continued haemorrhage despite an anterior pack may be due to a posterior nasal bleed and should prompt consideration of placing a postnasal pack; the most commonly used device being a Foley catheter. Remove the anterior pack and re-examine the nasal cavity using suction as required. Hold the tip of the catheter with a pair of forceps and with the patient breathing through the mouth, feed the catheter horizontally along the nasal floor. Once you see the tip passing beyond the palate into the oropharynx, inflate the balloon with 5-10 ml of water. Ask a colleague to gently pull the catheter forwards until resistance is encountered. The inflated balloon now acts as a tamponade on the posterior bleed. Re-insert a further anterior nasal pack on both sides and secure the catheter with an umbilical clip (or equivalent) to prevent potential airway blockage. Ensure that the catheter is not pressing on the nose as alar necrosis may occur. This can be prevented by applying a soft dressing around the nostril.

e) The nasal bone is one of the most commonly fractured areas in the body. As this is a clinical diagnosis, there is no need to confirm with an x-ray unless a medicolegal requirement exists. The most important aspect of management is to ensure there is no associated septal haematoma, skull base or orbital rim fracture. The nasal bone may be deviated laterally or depressed medially. A manipulaton under local or general anaesthesia should be carried out within 14-21 days of injury before the bone has started the reparative process. A formal septorhinoplasty procedure may be indicated after this time period if the patient has significant nasal airway obstruction.

f) Severe epistaxis should prompt thoughts of which side is bleeding and how much is it bleeding. Nose bleeds sufficient to cause systemic hypotension should be treated and resuscitated like any other major haemorrhage. It is useful to try and identify whether it is predominantly an anterior (bleeding through the nostrils) or posterior (bleeding into the oropharynx) haemorrhage. Is this a recurrent bleed or has there been a history of recent trauma? Past medical history is important and should enquire specifically about a personal or family history of bleeding diathesis such as Von Willebrands disease and a drug history should note antiplatelet agents (aspirin, dipyridamole or clopidogrel) and anticoagulants.

Question 3

a) The history of a recent change in shape and size is concerning. Other important factors to note include a change in colour, itching, bleeding, inflammation around the lesion and a diameter over 7mm. Risk factors for malignant melanoma (MM) include ultraviolet light exposure (periodic rather than chronic), sunburns during childhood, skin type I (never tans, always burns) or II (occasionally tans, always burns), family or personal history of this disease, a reduced immune state or large numbers of atypical naevi. Diagnosis can be helped by the mnemonic ABCD (Box 1)

	Features of this lesion suggesting malignancy
Asymmetry	This lesion is asymmetric in two axes, which is highly significant.
Border	Irregularity suggests a malignant potential.
Colour	The lesion is not uniformly coloured ie variegated.
Diameter greater than 7mm	This lesion measures 8mm.

Box 1. *ABCD mnemonic to aid diagnosis of malignant melanoma*

b) It is important to examine for cervical node enlargement and perform a thorough cutaneous examination of the rest of the body looking for other atypical naevi or satellite lesions. There are no strict rules in terms of the diameter of the lesion. For example a benign mole can be larger than 7mm and a malignant mole can be smaller than 7mm. After a thorough history, ABCD can help in assessment and in deciding if the lesion is benign. This patient should be considered to have a malignant melanoma until proven otherwise and a referral should be made to a specialist.

c) There are minimum standards for skin cancer care based on UK Department of Health guidelines [4]. A routine referral letter for this patient is inappropriate. It is recommended that any pigmented lesion suspected of being a skin cancer should be referred to a dermatologist or a nominated specialist within the Trust. There should be a mechanism by telephone, e-mail or secure fax to provide GPs with rapid access to the appropriate specialist in the multidisciplinary team for skin cancer. Referrals

for a suspected MM or Squamous Cell Carcinoma must be seen within ten working days.

d) The Breslow thickness is the depth in millimetres from the stratum granulosum of the epidermis to the deepest melanoma cell and is the most important factor affecting prognosis (Table 2). The rationale for a wide excision is based on the capacity of the malignant melanoma cells to migrate away from the original tumour site. This lesion needs further excision. A Breslow thickness of 0.6mm means wherever possible the malignant melanoma should be excised with 1cm margins [5]. It should be possible to re-excise the helical rim as a wedge with 7-8 mm clearance and reconstruct by use of a Donnelly flap (Figure 6) or other suitable alternative.

Lesion	Breslow Thickness	Excision Margins
Lentigo Maligna (*in situ*)		5mm
Malignant Melanoma	less than 1mm	1cm
	1-2mm	1–2cm
	2-4mm	2cm
	greater than 4mm	2cm

Table 2: *British Association of Dermatologists excision margin guidelines for Malignant Melanoma [4]*

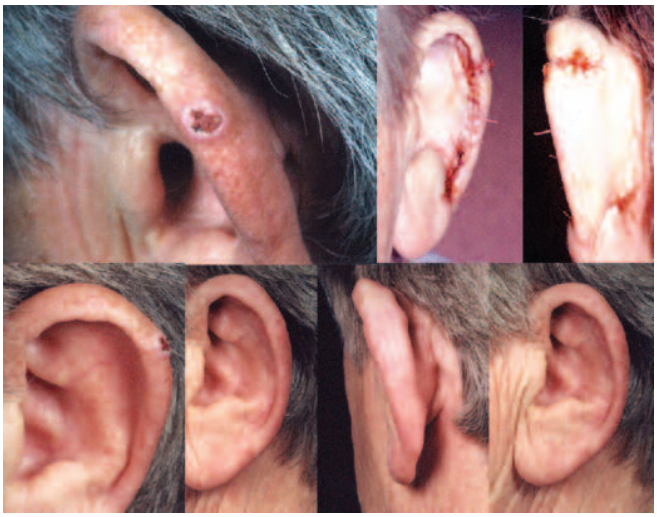

Figure 6: *Donnelly flap*

e) There are five main categories of melanoma based on growth patterns (Table 3). Lentigo maligna *in situ* refers to atypical melanocytes which are restricted to the epidermis (radial growth phase). After histological confirmation, complete excision with a 2-5mm margin is the correct management. Once it breaches the basement membrane and shows dermal invasion (vertical growth phase), then this is a lentigo maligna melanoma. Lentigo maligna melanoma tends to occur on sun damaged areas of the head and neck region. Typically these develop as slow-growing, irregular, broad patches of pigmentation which then develop a papule or nodule. A biopsy is indicated for any changing pigmented lesion. Lentigo maligna melanoma is treated like any invasive MM according to the Breslow thickness. Superficial spreading malignant melanoma is the most common type of MM and is most frequently seen on the trunk of men and legs of women. Nodular MM is more commonly observed in men than women and usually presents as a proliferative blue-black nodule which may be ulcerated and bleeds spontaneously. Acral lentiginous melanoma occurs on the soles of feet, palms of the hand or under nailbeds. Any pigmentation around the nail should arouse suspicion of acral lentiginous melanoma unless a good explanation, such as recent trauma, is forthcoming [6].

Type	Frequency %
Lentigo maligna melanoma	5-15
Superficial spreading malignant melanoma	60-70
Nodular melanoma	15-30
Acral lentiginous melanoma	5-10

Table 3: *Frequency of malignant melanoma sub-types [6]*

f) Assuming this patient has clear margins, her five-year survival rate is 95-100%. Table 4 shows approximate figures for five-year survival according to Breslow thickness [7]. A more accurate estimation of prognosis can be estimated based on other important prognostic factors like ulceration, local, regional and distant metastasis, age, site and sex. Advancing age, male sex and lesions located on the head, neck or trunk usually do less well. Vascular or lymphatic invasion seen on histology is also important to note. Sentinel node biopsy is a sampling technique using dye or radioactive material to identify the first echelon draining lymph node. If the histology confirms malignant invasion of the node a subsequent neck dissection may be performed. In the UK, this procedure is the subject of a clinical trial; suitable candidates must have MM >1mm thickness without palpable lymph node involvement. So far the technique is more commonly used in melanoma restricted to upper or lower limbs

Breslow thickness	5 Year Survival Rate
Melanoma in situ	100%
Less than 1mm	>95%
1-2mm	89-91%
2-4mm	77-79%
>4mm with no ulceration	63-67%
>4mm with ulceration	45%

Table 4: *Prognosis of malignant melanoma [7]*

Question 4

a) The history and examination findings suggest a stone in the submandibular duct. The patient describes each episode to recur after meals. Sialolithiasis is the formation of a stone within the salivary gland duct or parenchyma. Approximately 90% of the cases of sialolithiasis occur in the submandibular gland because of the more alkaline and viscid saliva produced. Other factors that predispose to stasis in Wharton's duct may play a role (e.g an upward course, a dependent gland, a wider lumen, and a tighter orifice). The parotid gland will account for about 10% of sialolithiasis. Stones are generally not found in sublingual or minor salivary glands.

b) The treatment for small stones is conservative with the goal of aiding the passage of the stone and restoration of salivary flow. This may include increased fluid intake, sialogogues, moist heat, and massage. Non-steroidal anti-inflammatory drugs can be used for pain control if no contraindication exists. Intra-oral

resection can be performed for isolated distal duct ie close to the ampulla, sialoliths. For proximal or glandular sialoliths, the surgeon may decide to treat the patient with resection of the gland (Figure 7). This is often the preferred treatment for patients with recurrent bouts of sialolithiasis with sialadenitis.

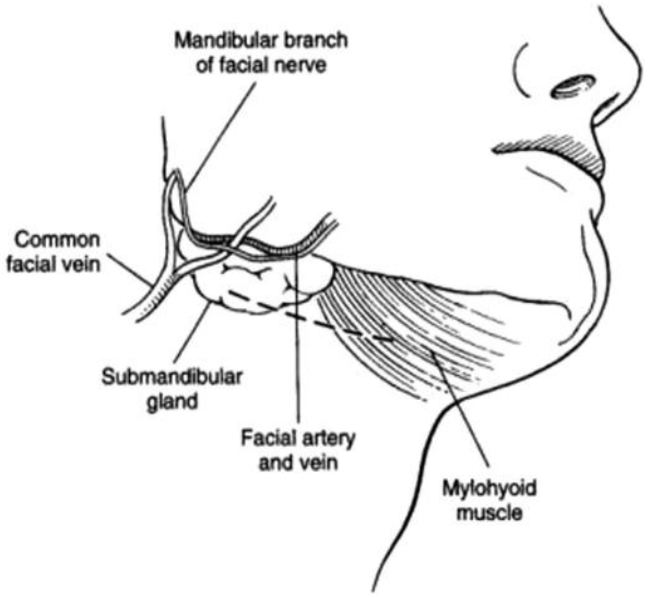

Figure 7: *Surgical anatomy of the right submandibular gland*

c) Submandibular gland stones may be associated with poor dentition or recurrent pharyngitis that is refractory to antibiotic therapy. Bacterial infection (most commonly with Streptococcus viridans) can occur with prolonged obstruction that results in stasis of saliva.

d) Plain x-ray of the affected region can be helpful in the diagnosis. The floor of mouth x-ray is simple and available in most departments. In this particular situation no further imaging may be necessary. Other investigations include ultrasound, non-contrast enhanced computed tomography and magnetic resonance imaging.[8] Sialography is mainly reserved for the evaluation of chronic sialadenitis.

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