CDE Self Assessment in Clinical Dentistry

Dr. Wong Foot Meow, BDS(Mal) FDSRCPs (Glasg) FICS AM(Mal) FICOI

The article has been accredited by Health Authority - Abu Dhabi as having educational content and is acceptable for up to 2 (Category 1) credit hours. Credit may be claimed for one year from the date of subscription.

Prelude
This is a new section of the CDE Self Assessment Series in Clinical Dentistry, Dental Quiz Questions. Note that we have decided to be more clinically orientated with more emphasis on medically related conditions that can affect dental treatment. In this section, we will delve into the intricacies of some soft tissue and dental anomalies. This dental quiz serves to update your CDE prowess.

QUESTION 1: DIFFERENTIAL DIAGNOSIS OF JAW CYSTS AND TUMOURS

The most common intra-bony non-inflammatory diseases in the jaws are odontogenic cysts and tumours. However, in the differential diagnosis of jaw lesions, the following must also be considered: i.e., non-plasms, primary and metastatic tumours, developmental lesions, fibrous lesions and dysplastic processes.

Think before you cut. An initial differential diagnosis can be established by obtaining a complete history after performing a thorough physical examination. These preliminary data obtained will influence the diagnostic tests ordered and the eventual choice of incisional or excisional biopsy.

CASE 1A
This 27-year-old Chinese female clerk was blissfully unaware of the huge swelling in the anterior floor of her mouth until her well-informed dentist Dr. C advised her to see me for further management.

a. What is wrong with the floor of the mouth? (Fig. 3a)
b. What anatomical structures are involved with the swelling?
c. Will she have any distinct functional problem in speech and mastication?
d. We decided to perform an excisional biopsy (Fig. 3b).

e. Fig. 3k indicated the importance of preoperative investigation of jaw lesions, the following must also be considered: i.e., non-plasms, primary and metastatic tumours, developmental lesions, fibrous lesions and dysplastic processes. However, in the differential diagnosis?

ANSWERS QUESTION 1: CASE 1A

a. A huge soft tissue swelling is seen in the mid-line of the floor of the mouth, bulging upwards and outwards towards the oral cavity as the mouth is opened. Normally, the lingual frenum is near the lingual surfaces of teeth 31 and 41. In this case, even the opening of the sublingual salivary gland (seen as two modules lateral to the frenum) is displaced posteriorly. In addition, the outlines of the paired sublingual glands have disappeared and a distinct firm hemispherical swelling is apparent.

b. The floor of the mouth is the mylohyoid muscle. Above this muscle lies the mouth, below it lies the neck. The structures to watch for when operating around this area are: geniohyoid muscles, the lingual nerve, submandibular gland, submandibular duct and hypoglossal nerve. In addition, you must be mindful of the sublingual gland, lingual ar-
d. An incisional biopsy is done 

An incisional biopsy is done for the following reasons:

1. To confirm the diagnosis of a suspected lesion.
2. To determine the extent of a lesion.
3. To obtain material for histological examination.
4. To aid in the surgical planning.
5. To assess the response to treatment.

b. It is usually done to operate on the buccal mucosa. Structures to watch out for include the opening of the parotid salivary gland (Stenson’s Duct), long buccal nerves and branches of the facial artery. The cheek has four layers: cutaneous, muscular, glandular and mucosal together with the buccal pad of fat, molar glands and buccopharyngeal fascia. Where the facial artery crosses from lower to upper jaw, it is applied to the buccinator muscle an inch from the angle of the mouth! Notice that in Fig. 5h, we avoided the angle of the mouth and did not dissect into the muscular layer.

c. Notice that in Fig. 5i, you can see the branches of the long buccal nerve, the buccinator muscle the glandular and mucosal layers. The buccal pad of fat can be seen near the suction site.

d. This soft lobulated tumour (Fig. 5j) measured 5 cm x 4.5 cm x 1.4 cm. It is a lipoma, which is a benign tumour composed of mature fat cells. The fat cells in this tumour are histologically similar to normal fat cells but metabolically different as fat is not lost from a lipoma during a starvation diet. The slow growth with rounded, even and smooth contour with the smooth capsule suggests a benign tumour. The oral lipoma is a sessile or pedunculated, painless, slow-

growth and muscles. (This is according to the HPE report.)

• The soft tissues of the floor of the mouth can accommodate quite a large swelling if it is slow-growing. As they increase in size, they push apart the genioglossus muscles moving deeper into the floor of the mouth and backwards into the tongue thereby allowing adaptation and causing minimal problems in the oral cavity.

b. As mentioned earlier, complete haemostasis must be secured to avoid haematoma formation and subcutaneous ecchymosis of the neck. If required, a drain should be placed. Always test the patency of the submandibular ducts to avoid salivary gland problems. Antibiotics and anti-swelling medication must be given to reduce swelling of the floor of the mouth.

In the centre is the branch of the lingual artery which, if breached, will cause copious bleeding and possible haemorrhage formation.

Parts of the (L) and (R) sublingual salivary glands are seen at the lateral margins.

If the excision is extended posteriorly, we will come across the hyoglossus muscle, submandibular duct and lingual nerve (“tiger country”). The yellow blob is a daughter cyst of the huge cyst emulsified (Fig. 5d).

Histopathology reported the specimen in Fig. 5d as a dermoid cyst. The dermoid cyst is a form of cystic teratoma derived principally from embryonic germinal epithelium which in some instances contains structures of other germ layers. Origin: Those cysts are presumed to be derived from entalisation of epithelial debris in the midline during the closure of the mandibular and hyoid branchial arches. Some of the cells in the cyst lining are epidermal in origin, containing keratin, sebaceous glands, hair follicles, sweat glands and muscles.

In Fig. 5c, notice the bloodless field achieved by careful dissection. The following structures are discernible in the operating field.

• Genioglossus, which forms the bulk of the tongue (seen superior to the yellow blob).

• The geniohyoid muscle sitting on top of the mylohyoid muscle.

In Fig. 3d, notice the lining of the skin of the neck may be preserved simply. The yellow blob is a branchial cleft cyst (b) Branchial cleft cyst (c) Thyroglossal tract cysts (d) Cystic hygroma (e) Branchial cleft s.) Cellulitis of the floor of the mouth (g) Infection of sublingual and submandibular glands (h) Benign and malignant tumours of the floor of the mouth, and (i) Normal adipose tissue in the submucosal area.

CASE 1B

a. Notice the following signs of swelling in Fig. 5g. Compare this with Fig. 5i.
CASE IC

This 52-year-old Chinese housewife presented around Chinese New Year Eve 2004 for a rapidly enlarging swelling which started some months back.

a. The facial asymmetry is highly obvious. Describe what you see? (Fig. 3m)
b. The intra-oral appearance looks bleak. Why? What features in Fig. 5a suggest that we are dealing with something aggressive, fulminating and probably malignant?
c. The X-ray appearance in Fig. 5o confirms our suspicions beyond doubt! What can you see in the (R) maxillary sinus?
d. We actually excised the lesion in toto after an initial incisional biopsy confirmed the photos were lost. What do you think we did?

case ID

This 60-year-old Chinese businesswoman has had a growth in the (L) maxilla for the last five years:

a. What features in Fig. 5p suggest a benign growth in the (L) maxilla?
b. Fig. 5q (mirror image appearance) actually the growth is on the (L) side has a unique feature. What is it? Which tooth is the culprit?
c. The X-ray appearance confirms the benign nature in contrast with Fig. 5r. What features indicate its non-aggressive nature?
d. The growth was enucleated (Fig. 5s). Are you likely to encounter any vital structures in the maxilla?

case IE

This 74-year-old Malay housewife complained of trismus, pain of (L) jaw and inability to eat plus difficulty in swallowing saliva.

a. What can you see in Fig. 5u? What signs indicate that this is probably not an aggressive growth but inflammatory in nature?
b. Fig. 5v is the extra-oral presentation. Describe what you see and correlate it with your diagnosis.
c. The intra-oral appearance Fig. 5w confirms that this lesion is probably of infective origin. Why?
d. The X-ray view (Fig. 5x) is highly informative. What can you see? How does the appearance of the mandibular bone explain your findings in Fig. 5z and Fig. 5a? What are those multiple radio opaque lines?
e. After one month of conservations, treatment, the patient was cured. Fig. 5y (intra-oral appearance) confirms this. What do you think the problem was and what did we do to achieve a cure?

The rationale for putting forward cases 1A to 1E, is to help readers achieve some skills in narrowing down the identity of a lesion from differential diagnosis. How would you establish a differential diagnosis? (Hint: three main steps.)

CASE IC

The patient has squamous cell carcinoma in site and antrum which accounts for more than 90% of antral malignancies.

a. Compare Fig. 5m (extra-oral view) with Fig. 5g. Notice the following:
- Unilateral swelling of the (R) cheek. The overlying skin is glistening and taut owing to massive expansion of the underlying (R) maxillary sinus.
- The (R) angle of the mouth is pushed inferiorly and outwards with complete loss of the nasolabial fold.
- The (R) eye is pushed upwards (proporzd) with loss of demarcation of the lower eyelids.
- The (R) nostril is pushed inferiorly and outwards.
- There is complete anaesthesia of the infraorbital skin and lack of facial expression.

b. The intra-oral view (Fig. 1n) is highly indicative of an aggressive malignant lesion. Notice the central necrosis of the (R) dentoalveolar process and the fungating red margins. The upper (R) posterior teeth have all been exfoliated with complete obliteration of the (R) buccal sulcus, The palate is deformed with loss of palatal vault contour.

c. The characteristic radiographic changes of antral mucosal malignancy include the following (Fig. 5g):
- Destruction of the lateral and inferior bony walls of the (R) maxillary antrum.
- The inferior orbital margin has been infiltrated. Surprisingly, the lateral walls of the (R) nostril remain intact.
- The (R) nasal turbinates has been completely destroyed with loss of all upper (R) posterior teeth.
- The (R) zygomatic complex is completely opaque. All the above features can be elicited by comparing with the normal anatomy of the (L) nostril, orbit, antrum and zygomatic complex.

d. This is an extremely mutilating operation and the patient must be prepared psychologically as there are acute social post-operative problems of appearance, speech, mastication and physical suffering after the operation. A (R) total maxillectomy was done via a Weber-Fergusson skin incision (Fig. 5a and Fig. 5b). After securing haemostasis, we applied a skin graft from the opposite thigh. The skin graft is
applied to the raw surface of the cheek flap and the pterygoid fossa. This is important. If the inner surface of the flap is not grafted, the cheek will contract badly. A denture obturating with black gutta percha stent is used to fill the cavity and give support to the cheek and flap. The denture obturating is held in place by (R) and (L) circumzygomatic stainless steel wires.

Case 1D

Odontogenic cysts arise from epithelium concerned in tooth formation and comprise three main types—periapical, dentigerous and primordial. The latter types—periodontal, dental and salivary gland involvement account for the odontogenic cysts. This patient had a long-standing periapical cyst arising from a non-vital lower (L) lateral incisor tooth.

a. Although the growth was allegedly present for at least 5 years, the only visible signs were splaying of the (L) maxillary anterior teeth and a distinct bulge of the (L) buccal sulcus. The colour and markings of the labial mucosa are normal.

b. Visible and palpable expansion of the (L) palate is seen in Fig. 5g. Normally, this sort of swelling occurs with maxillary cysts related to the posteriorly inclined root of the lateral incisor and palatal roots of the first premolar and molar teeth. Notice the bluish tone of the palatal mucosa where the cyst had perforated the palatal bone and the labial proclination of tooth 21 and 22. Although tooth 22 is the cusp tip, tooth 21 has moved quite a bit labially. The swelling is confined to the left because of the midpalatal raphe and rapha.

c. The following features are highly indicative of a benign cystic growth (Fig. 5r).

- Minimal displacement of teeth with intact roots in a rounded clearly radiolucent area with a sharply defined outline.
- Unilocular lesion with clear condensed peripheral radiopaque margins or cortex.
- Surrounding structures and alveolar bone remain intact with the usage distinct radiographic markings.
- No loss of teeth and dental tissue in spite of the size of the cyst.

It is unusual for intra-oral imaging to reveal areas of radiolucency indicative of bone destruction. These areas extend from tooth 11 to tooth 26. The labial wall was naturally created as it has become eggshell in the thickness. Notice the smooth internal walls.

e. The specimen in Fig. 5e represents the cyst wall and capsule. The cyst capsule contains collagenous fibrous connective tissue. There is minimal inflammatory infiltrate with evidence of areas split by spaces and clefts (cholesterol clefts). The fluid has been evacuated but was watery with a shimmering appearance because of the cholesterol crystal effect. The only vital anatomical structures of note in this operation would be the apices of the neighbouring teeth, the incisive canal and the (L) maxillary antrum. Avoid traumatizing the inferior lateral floor of the (L) nostril and possible perforation of the palatal mucosa.

Case 1E

a. Severe infections are uncommon in the mouth but this case took on a combination of the following forms: osteomyelitis, cellulitis and soft tissue abscess. Fig. 5a revealed soft tissue abscesses in the lower (L) lower molar region and left extra-oral submandibular abscess. (The history indicated that cellulitis had occurred here before the abscess appeared.) The first step in the management of this case is to determine that the patient is not medically compromised with diabetes or on immunosuppressive drugs or other chronic illnesses.

b. Fig. 5v indicates that the lesion is probably inflammatory in nature. There is no facial asymmetry and no change in jaw outlines. The lips and overlying skin look normal. The skin is not stretched and not usual ageing spots, pigmentation and moles are clearly set in normal looking facial skin. The sudden onset and the initial favourable response to antibiotics indicates that this is an inflammatory condition.

c. Fig. 5y is highly informative. Except for the soft tissue abscess, there is no swelling of the buccal or lingual cortical plate. The lingual and buccal sulcus are within normal limits. The tongue looks coated and fuzzy, indicating an infective origin.

d. The X-ray view is highly unique (Fig. 5x). The patient has multiple “susak.” These are gold needles inserted by bomohs (medicine men) in Asian women who believe that it will retard ageing and help maintain their attractiveness.

Notice the following in Fig. 5x:
- The sharp trabecular pattern of the bone is lost where bone had been resorbed and areas of radiolucency indicative of bone destruction have appeared. These areas extend from tooth 13 all the way to the (L) retro-molar area giving a classical appearance of bone with ill-defined margins resembling a fluffy or “moth-eaten” appearance.
- The patient has osteomyelitis of the mandible secondary to the “susak.” There were no obvious dental causes. The principles of management for this case were as follows:
  - Bacteriological diagnosis via specimen of pus.
  - Antibiotics—Clindamycin 300 mg. bd x 10 days.
  - Incision and drainage of the infra-oral and extra-oral soft tissue abscesses.
  - Removal of sequester after infection was controlled. The key in this case is the Clindamycin, which in my experience works beautifully in resolving osteomyelitis as seen in the pre-treatment views of Fig. 5y and Fig. 5z. Notice the severe healing with no signs of scarring whatsoever. Osteomyelitis is a severe infection and must be treated with the utmost respect as it can cause the following complications: (a) Inferior dental nerve anaesthesia, (b) pathological fracture, (c) cellulitis especially if staphylococci is involved and, (d) septicaemia especially in older patients.

f. Establishment of a differential diagnosis of abscesses can be methodically done with the following steps i.e., history, physical examination, diagnostic imaging and biopsies.

- History
- Pain—Not a feature of cysts and tumours unless there is secondary infection or neural invasion.
- Swelling—Persistent slow growth suggests an expanding lesion. Rapid growth suggests concurrent infection or an aggressive lesion.
- Loss of Function—Trismus results from intra-capsular or extra-capsular TMJ disease. Extra-capsular causes of decreased function include inflammation of the muscles of mastication, paramaxillary pain of any artiography and tumour invasion from the jaws into the surrounding soft tissues.
- Sensory or Motor Changes—Altered or lost sensation along the distribution of V1, V2 or V3 indicates spreading infection, and invasive malignant or aggressive benign tumour.
- Physical Examination: Inspection, palpation and thorough physical evaluation.
  - Surface Changes—Is it chemical, traumatic, vesicular bulous, neoplastic, metabolic or inflammatory?
- Olfactory Findings—Necrotic lesions of the jaws portend advanced disease. Necrotic tissue has a characteristic order (especially in cancer patients) that is readily identifiable. Anergic infections associated with cysts and tumours are also foul smelling. Sebaceous material found from cysts is easily identified by the appearance and strong odour. All of the above is represented by the five cases presented earlier.
- Diagnostic Imaging—Most plain radiographs and the various oral views are adequate to carry out a provisional diagnosis. If need be, tomography, CT scan and MRI scanning can be helpful.
- Biopsy—If all three steps are methodically followed, definitive diagnosis can be obtained by the biopsy i.e., aspiration, incisional or excisional biopsy.