CDE Self Assessment in Clinical Dentistry

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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 metastastic 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. What is the difference between an incisional biopsy and an excisional biopsy? Which important possible post-op complication must your warn the patient about before proceeding?
e. Why is the incision shaped like this? Describe what you see in Fig. 3b.
f. The lesion had been enucleated in toto as shown in Fig. 3c. What anatomical structures can you see? What is the yellow blob on the (L) lateral corner near tooth 34?
g. Consider the excised lesion in Fig. 5d. It measured 6 cm x 5 cm x 5 cm. What can you see? How can such a huge lesion exist without alarming the patient?
h. The surgical closure (Fig. 5e) and one week post-op (Fig. 5f). What post-op measures must you take to avoid complications? What are the types of mid-line swellings that you must consider 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-
The healthy human mouth is inhabited by changes in the microbes nor-

tually margins can be obtained in the time of biopsy;  
- Pre-operative warnings. The patient should be warned of possible lingual paresthesia and loss of taste sensation.  

**VERY IMPORTANT!** Haematoma of the floor of the mouth and subcutaneous ecchymo-

**• Increase in size of the lower lip and loss of taste sensation.**

**• Pre-operative warnings. The incision is made submu-

**cosally in the gutter between the hyglossus muscle and the super-

**ficial lingual vessels. In this way, you are likely to avoid traumatising the lingual nerve, submandibular duct and lin-

**gual vessels.**

**g. In Fig. 5c, notice the blood-

**less field achieved by care-

**ful 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 genihyoid muscle at-

**ting on top of the mylohyoid muscle.**

**c. The centre is the branch of the lingual artery which, if breached, will cause copi-

**ous bleeding and possible haematoma formation.**

**d. Fullness of the (L) cheek.**

**• Fullness of the (L) nasolabial fold.**

**• Loss of the (L) side is enlarged with slight lifting of the (L) ear-

**lobe.**

**• Fullness of the (L) cheek.**

**• Angle of the (L) corner of the mouth is indistinct.**

**b. It is usually quite safe to oper-

**ate on the buccal mucosa.**

**• Dif f erentiation diagnosis of swellings of the floor of the mouth.**

**• Fullness of the (L) cheek.**

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**• Angle of the (L) corner of the mouth is indistinct.**

**b. It is usually quite safe to oper-

**ate on the buccal mucosa.**

**Structures to watch out for in clude: the opening of the parotid salivary gland (Sten-

**son’s Duct), long buccal nerves and branches of the ma-

**xilla.**

**The cheek has four layers: cutaneous, muscular, glandular and mucosal to-

**gether with the buccal pad of fat, molar glands and bucc-

**opharyngeal 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 mu-

**cous layers. The buccal pad of fat can be seen near the suction tube.**

**d. This soft lobulated tumour (Fig. 5j) measured 5 cm x 4.5 cm x 4 cm. It is a lipoma, which is a benign tumour com-

**posed of mature fat cells. The fat cells in the lipoma are histo-

**logically similar to normal fat cells but metabolically differ-

**ent. As fat is not lost from a lipoma during a starvation diet, the slow growth with rounded, even and smooth contour with the smooth cap-

**sule suggests a benign tumour. The oral lipoma is a sessile or pedunculated, painless, slow-

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post-operative complications

cell carcinoma of the maxillary
antrum which accounts for

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) maxil-
lar sinus.

• The (R) angle of the mouth
is pushed inferiorly and out-
wards with complete loss of
the nasolabial fold.

• The (R) eye is pushed up-
wards (proptosed) with loss of
demarcation of the lower
eyelids.

• The (R) nostril is pushed in-
feriorly and outwards.

• There is complete anaesthe-
sia of the infraorbital skin
and lack of facial expres-
sion.

b. The intra-oral view (Fig. 5n)
highly indicative of an aggres-
sive 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 com-
plete obliteration of the (R)
 buccal sulcus. The palate is
defomed with loss of palatal
vault contour.

c. The characteristic radi-
ographic changes of antral mu-
cosal malignancy include the
following (Fig. 5o):

• Destruction of the lateral and
inferior bony walls of the (R)
maxillary anturum.

• The inferior orbital margin
has been infiltrated. Surpris-
ingly, the lateral walls of the
(R) nostril remain intact.

• The (R) maxillary sinus has
been completely de-
stroyed with loss of all upper
(R) posterior teeth.

• The (R) zygomatic complex
is completely opaque. All the
above features can be eluci-
dated by comparing with the
normal anatomy of the (L)
nostril, orbit, antrum and zy-
gomatic complex.

d. This is an extremely mutilat-
ing operation and the patient
must be prepared psychologi-
cally as there are acute social
post-operative problems of ap-
pearance, speech, mastication
and physical suffering after
the operation. A (R) total max-
illectomy was done via a We-
ber-Fergusson skin incision
(Fig. 5a and Fig 5b). After se-
curing haemostasis, we ap-
piled a skin graft from the
opposite thigh. The skin graft is

Media CME

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growing mass arising from the
submucous connective tissue
of the cheek. They are very soft
and may exhibit pseudo-fluc-
tuation. This particular lipoma
is palpable in its entirety and is
fully mobile in the cheek when
palpated.

c. Post-operative complications
for this type of operation will
include swelling, acute pain,
haemorrhage, infection, wound
dehis-
cence and wound dehis-
cence.

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 1C

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. 5m)

b. The intra-oral appearance
looks bleak. Why? What
features in Fig. 5n suggest
that we are dealing with
something aggressive, fulmi-
nant and probably ma-
lignant?

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 culprit?

e. What can you see in Fig. 5p?
What signs indicate that this
is probably not an aggressive
growth but inflammatory in
nature?

f. The intra-oral appearance
Fig. 5q confirms that this
lesion is probably of infective
origin. Why?

g. The X-ray view (Fig. 5x) is
highly informative. What can
you see? How does the ap-
pearance of the mandibular
bone explain your findings in
Fig. 5x and Fig 5w? What are
those multiple radio opaque
lines?

h. After one month of conserva-
tion treatment, the patient
was cured. Fig 5y (intra-oral
appearance) confirms this.
What do you think the prob-
lem was and what did we do
to achieve a cure?

The rationale for putting for-
ward 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 differ-
cential diagnosis? (Hint: three
main steps.)

CASE 1D

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

a. What features in Fig. 5p sug-
gen 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 con-
irms 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 en-
counter any vital structures in
the maxilla?

CASE 1E

This 74-year-old Malay house-
wife complained of trismus,
pain of (L) jaw and inability
to eat plus difficulty in swallow-
ing 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 pres-
centation. 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?
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 obturator with black gutta percha stent is used to fill the cavity and give support to the cheek flap. The denture obturator is held in place by (R) and (L) circumvallatory stainless steel wires.

CASE 1D

Odontogenic cysts arise from epithelium concerned in tooth formation and comprise three main types—periodontal, dentigerous and primordial. The periodontal cysts form the majority of the odontogenic cysts. This patient had a long-standing periodontal cyst arising from a non-vital upper (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. Viable 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 pre-molar and molar teeth. Notice the bluish tone of the palatal mucosa where the cyst had perforated the palatal bone and the labial projection of tooth 21 and 22. Although tooth 22 is the culprit, tooth 21 has moved quite a bit laterally. The swelling is confined to the left because of the midpalatal raphe and rugae.

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 bones remain intact with the usage distinct radiographic markings.

- No loss of teeth and dental tissue in spite of the size of the cyst.

- Incision and drainage of 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 border of the (L) maxilla.

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 the 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. 5w 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 furry, indicating an infective origin.

d. The detailed case report is highly unique (Fig. 5x). The patient has multiple “susak”. These are gold needles inserted by bomuls (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 15 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.

e. 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 a specimen of pus.

- Antihistamines—Clindamycin 500 mg, bd x 10 days.

- Incision and drainage of the intra-oral and extra-oral soft tissue abscesses.

- Removal of sequestra after infection was controlled. The key in this case was the Clindamycin, which in my experience works beautifully in resolving osteomyelitis as seen in the post-treatment views of Fig. 5y and Fig. 5z. Notice the sharp 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) septicarctia especially in older patients.

f. Establishment of a differential diagnosis of abscesses and tumours 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-capular or extra-capular TMJ disease. Extra-capular causes of decreased function include inflammation of the muscles of mastication, paramarginal 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, 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, metallic or inflammatory?

Swelling—Note the location, tissue and origin, time of onset, rate of enlargement, changes in size and relation to eating and jaw function.

Olfactory Findings—Necrotic lesions of the jaws portend advanced disease. Necrotic tissue has a characteristic order (especially in cancer patients) that is readily identifiable. Anaerobic infections associated with cysts and tumours are also foul smelling. Schessicus material found from cysts is rapidly 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 undertaken, failure of definitive diagnosis can be obtained by the biopsy itself, aspiration, incisional or excisional biopsy.