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This series provides an overview of current thinking in the more relevant areas of Oral Medicine, for primary care practitioners.

The series gives the detail necessary to assist the primary dental clinical team caring for patients with oral complaints that may be seen in general dental practice. Space precludes inclusion of illustrations of uncommon or rare disorders.

Approaching the subject mainly by the symptomatic approach, as it largely relates to the presenting complaint, was considered to be a more helpful approach for GPs rather than taking a diagnostic category approach. The clinical aspects of the relevant disorders are discussed, including a brief overview of the aetiology, detail on the clinical features and how the diagnosis is made, along with guidance on management and when to refer, in addition to relevant websites which offer further detail.

Oral Medicine: 11. Lumps and Swellings: Mouth

Specialist referral may be indicated if the Practitioner feels:

- The diagnosis is unclear;
- A serious diagnosis is possible;
- Systemic disease may be present;
- Unclear as to investigations indicated;
- Complex investigations unavailable in primary care are indicated;
- Unclear as to treatment indicated;
- Treatment is complex;
- Treatment requires agents not readily available;
- Unclear as to the prognosis;
- The patient wishes this.

benign to malignant, may present as oral lumps or swellings (Table 1) including:

Developmental: unerupted teeth, and tori—congenital bony lumps lingual to the mandibular premolars (*torus mandibularis*; Figure 1), or in the centre of the palate (*torus palatinus*; Figure 2) are common causes of swellings related to the jaws (Article 13).

Inflammatory: dental abscess is one of the most common causes of oral swelling. However, there is a group of conditions characterized by *chronic* inflammation and granulomas, which can present with lumps or swellings. These, include Crohn's disease, orofacial granulomatosis (OFG), and sarcoidosis, which are discussed below.

Traumatic: haematoma may cause a swelling at the site of trauma. The flange of a denture impinging on the vestibular mucosa may stimulate a reactive irregular hyperplasia (denture-induced hyperplasia) (Figure 3).

Neoplasms: benign epulides (Figure 4), fibrous lumps (Figure 5) or malignant tumours such as oral squamous cell carcinoma (OSCC), Kaposi's sarcoma and other neoplasms may present as swellings, as discussed in Article 3. Occasionally,



Figure 2. Palatal torus.



Figure 3. Denture-induced hyperplasia.



Figure 4. Epulis.



Figure 1. Mandibular tori.

metastatic malignant disease may present as a lump.

Fibro-osseous lesions: fibrous dysplasia and Paget's disease can result in hard jaw swellings.

Lumps and swellings: lumps in the mouth

Lumps and swellings in the mouth are common, but of diverse aetiologies (Table 1) and some develop into ulcers, as in various bullous lesions (Article 2) and in malignant neoplasms (Article 3).

Many different conditions, from

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Normal Anatomy	Pterygoid hamulus Parotid papillae Lingual papillae
Developmental	Unerupted teeth Odontogenic cysts Eruption cysts Developmental cysts (eg thyroglossal, dermoid) Haemangioma Lymphangioma Maxillary and mandibular tori Hereditary gingival fibromatosis Lingual thyroid
Inflammatory	Abscess Cellulitis Cysts Sialadenitis Pyogenic granuloma Chronic granulomatous disorders - Orofacial granulomatosis - Crohn's disease - Sarcoidosis Insect bites
Traumatic	Denture-induced hyperplasia Epulis Fibro-epithelial polyp Haematoma Mucocele Surgical emphysema
Neoplasms	Carcinoma Leukaemia Lymphoma Myeloma Odontogenic tumours Minor salivary gland tumours Others
Fibro-osseous	Cherubism Fibrous dysplasia Paget's disease
Hormonal	Pregnancy epulis/gingivitis Oral contraceptive pill gingivitis
Metabolic	Amyloidosis Other deposits
Drugs	Phenytoin Calcium channel blockers Ciclosporin
Allergic	Angioedema
Infective	HPV

Table 1. Main conditions which may present as lumps or swellings in the mouth.

Hormonal and metabolic: pregnancy may result in a gingival swelling (pregnancy epulis).

Drug-induced: a range of drugs can produce gingival swelling – most common are phenytoin, calcium channel blockers

and ciclosporin (Figure 6).

Allergic lesions: angioedema in particular can cause swellings.

Viral lesions: papillomas, common warts (*verruca vulgaris*) and genital warts (*condyloma acuminatum*) are all among the



Figure 5. Fibrous overgrowth.



Figure 6. Calcium channel blocker-induced gingival swelling.



Figure 7. Human papillomavirus infection.

lumps caused by human papillomaviruses (HPV; Figure 7).

Causes of lumps and swellings according to site

Carcinomas and other malignant neoplasms (Article 3) and pyogenic granulomas (Figure 8) can present in any site.

Gingiva

Sometimes, hyperplasia is congenital. Rapidly developing localized lumps, usually associated with discomfort, are most likely to be abscesses, usually a dental abscess. Other localized swellings are usually inflammatory, such as the pyogenic granuloma, or neoplastic.



Figure 8. Pyogenic granuloma.

Most generalized gingival swellings are due to hyperplasia with oedema related to plaque deposits, occasionally exacerbated by hormonal changes (puberty, pregnancy) or drugs. Such changes often develop slowly – over weeks rather than days – and are usually without discomfort.

There are very few serious causes of generalized enlargements of the gingivae appearing spontaneously or rapidly, but leukaemia is a prime example.

Palate

Lumps of the hard palate may develop from structures within the palate (intrinsic) or beyond it (extrinsic). Thus, for example, torus palatinus is an intrinsic bone lesion, whereas a dental abscess pointing on the palate (usually from the palatal roots of the first and second maxillary molars, or from upper lateral incisors) is extrinsic. Unerupted teeth, especially permanent canines, or second premolars are relatively common. Other causes of palatal swellings are uncommon but it should be remembered that the palate is the second most common site (after the parotid) for pleomorphic adenomas and other salivary neoplasms. Invasive carcinoma from the maxillary sinus may produce a palatal swelling. Kaposi's sarcoma, typical of HIV/AIDS, may also present as a lump in the palate, or elsewhere. Developing unilateral hard palatal swellings, characteristically disturbing the fit of an upper denture in older patients, may denote Paget's disease.

Floor of mouth

Swellings in the floor of the mouth are more likely to arise from

structures above the mylohyoid muscle than below it. The commonest swellings in the floor of the mouth are denture-induced hyperplasia and a salivary calculus.

Other lesions producing swellings in this area are a mucocoele arising from the sublingual salivary gland (known as ranula because of the resemblance to a frog's belly) and neoplasms of the sublingual salivary gland (usually malignant), but these are relatively uncommon. Patients occasionally describe a lump which proves to be a swelling of the lingual aspect of the mandible (more characteristic of ameloblastoma than of dental abscesses or cysts). Swellings of the submandibular salivary gland and adjacent lymph nodes may occasionally be described by patients as being in the floor of the mouth. However, only very large swellings below the mylohyoid muscle are likely to produce a bulge in the mouth. Swellings in the floor of the mouth may inhibit swallowing and have an effect on speech.

Mandibular tori produce bony hard swellings lingual to the lower premolars.

Tongue and buccal mucosa

Discrete lumps may be of various causes – congenital (Figure 9; haemangioma), inflammatory, traumatic or neoplastic.

The tongue may be congenitally enlarged (macroglossia) in, for example, Down's syndrome, or may enlarge in angioedema, gigantism, acromegaly or amyloidosis.

Causes of swellings include haematomas from trauma (such as occasional biting), infections, angioedema, fibro-epithelial polyps, fibrous lumps,



Figure 9. Vascular hamartoma (haemangioma).



Figure 10. Orofacial granulomatosis.



Figure 11. Cobble-stoning of buccal mucosa.

mucocoeles, vesiculobullous lesions and, occasionally, insect bites.

Systemic conditions such as Crohn's disease, orofacial granulomatosis and, occasionally, sarcoid may produce lip swelling (Figure 10) or widespread irregular thickening (cobble-stoning) of the cheek mucosa (Figure 11).

Some 'lumps' become ulcers, as in various bullous lesions, in primary and tertiary syphilis and in malignant neoplasms.

The flange of a denture impinging on the vestibular mucosa may stimulate a reactive irregular hyperplasia – the so-called denture granuloma or denture-induced hyperplasia. Salivary neoplasms in the lip may simulate, but are usually harder than, mucous cysts. Mucoceles are uncommon in the upper lip; discrete swellings there may well be a salivary gland neoplasm.

Diagnosis of the cause of a lump or swelling

When patients refer to a lump in the mouth it is important to establish when it was first noticed. The tongue often detects even very small swellings and patients may also notice a lump because it is sore. Most patients have only a passing interest in their

mouths but some examine their mouths out of idle curiosity, some through fear (perhaps after hearing of someone with 'mouth cancer'). Indeed, it is not unknown for some individuals (including dentists!) to discover and worry about the parotid papilla, foliate papillae on the tongue, or the pterygoid hamulus. The medical history should be fully reviewed, and there should be a thorough examination, since some systemic disorders, such as neurofibromatosis (Figures 12 and 13), may be associated with intra-oral or facial swellings.

Features of a lump which can be diagnostically useful are:

- The number of lesions, particularly with regard to whether the lesion is bilaterally symmetrical and thus possibly anatomical;
- Alteration in size;
- Any discharge from the lesion (clear fluid, pus, blood);
- Duration.

Important features to consider when making the provisional diagnosis of the cause of a lump or swelling include:

■ **Position.** The anatomical position



Figure 12. Neurofibromatosis, face



Figure 13. Neurofibromatosis, upper lip

should be defined and the proximity to other structures (eg teeth) noted:

- Midline lesions tend to be developmental in origin (eg torus palatinus);
- Bilateral lesions tend to be benign (eg sialosis – salivary swelling in alcoholism, diabetes or other conditions);
- Most neoplastic lumps are unilateral.

Other similar or relevant changes elsewhere in the oral cavity should be noted:

■ **Size.** The size should always be measured and recorded. A diagram or photograph may be helpful.

■ **Shape.** Some swellings have a characteristic shape which may suggest the diagnosis: thus a parotid swelling often fills the space between the posterior border of the mandible and the mastoid process.

■ **Colour.** Brown or black pigmentation may be due to a variety of causes such as a tattoo, naevus or melanoma. Purple or red may be due to a haemangioma, Kaposi's sarcoma or giant cell lesion.

■ **Temperature.** The skin overlying acute inflammatory lesions, such as an abscess, or a haemangioma, is frequently warm.

■ **Tenderness.** Inflammatory swellings such as an abscess are characteristically tender, although clearly palpation must be gentle to avoid excessive discomfort to the patient.

■ **Discharge.** Note any discharge from the lesion (eg clear fluid, pus, or blood), orifice, or sinus.

■ **Movement.** The swelling should be tested to determine if it is fixed to adjacent structures or the overlying skin/mucosa such as may be seen with a neoplasm.

■ **Consistency.** Palpation showing a hard (indurated) consistency may suggest a carcinoma. Palpation may cause the release of fluid (eg pus from an abscess) or cause the lesion to blanch (vascular), or occasionally cause a blister to appear (Nikolsky sign) or to expand. Sometimes palpation causes the patient pain (suggesting an inflammatory lesion).

The swelling overlying a bony cyst may crackle (like an egg-shell) when palpated or fluctuation may be elicited by detecting movement of fluid when the swelling is compressed. Palpation may disclose an underlying structure (eg the crown of a tooth under an eruption cyst) or show that the actual swelling is in deeper structures

(eg submandibular calculus).

■ **Surface texture.** The surface characteristics should be noted: papillomas have an obvious anemone-like appearance; carcinomas and other malignant lesions tend to have a nodular surface and may ulcerate. Abnormal blood vessels suggest a neoplasm.

■ **Ulceration.** Some swellings may develop superficial ulceration such as squamous cell carcinoma. The character of the edge of the ulcer and the appearance of the ulcer base should also be recorded.

■ **Margin.** Ill-defined margins are frequently associated with malignancy, whereas clearly defined margins are suggestive of a benign lesion.

■ **Number of swellings.** Multiple lesions suggest an infective or occasionally developmental, origin. Some conditions are associated with multiple swellings of a similar nature, eg neurofibromatosis.

Investigations

The nature of many lumps cannot be established without further investigation.

■ Any teeth adjacent to a lump involving the jaw should be tested for vitality, and any caries or suspect restorations investigated. ■ The periodontal status of any involved teeth should also be determined.

■ Imaging of the full extent of the lesion and possibly other areas is required whenever lumps involve the jaws. OPT and special radiographs (eg of the skull, sinuses, salivary gland function), computerized tomography (CT scans) or magnetic resonance imaging (MRI), or ultrasound may, on occasions, be indicated. Photographs may be useful for future comparison.

■ Blood tests may be needed, particularly if there is suspicion that a blood dyscrasia or endocrinopathy may underlie the development of a lump.

■ Biopsy is often required, especially if the lesion is single and chronic, since it may be a neoplasm or other serious condition.

Chronic granulomatous conditions

There are a number of conditions which present as chronic

swellings or lumps, and on biopsy have histological evidence of non-caseating epithelioid cell granulomas. These conditions include orofacial granulomatous, Crohn's disease, and sarcoidosis.

Orofacial granulomatosis

Orofacial granulomatosis (OFG) is an uncommon but increasingly recognized condition, seen mainly in adolescents and young adults, which usually manifests with facial and/or labial swelling, but which can also manifest with angular stomatitis and/or cracked lips, ulcers, mucosal tags, cobble-stoning or gingival swelling (Figures 10, 11; Table 2).

Some patients with similar features have, or develop, gastrointestinal Crohn's disease or sarcoidosis.

The aetiology of OFG is unknown but in some there is a postulated reaction to food or other antigens (particularly to additives/preservatives such as benzoates or cinnamaldehyde), or metals such as cobalt. Most patients appear to develop the problem in relation to dietary components such as chocolate, nuts, cheese or food additives.

Conditions related to OFG include Miescher cheilitis, where lip swelling is seen in isolation, and Melkersson-Rosenthal syndrome, where there is facial swelling with fissured tongue and recurrent facial palsy.

Diagnosis

Diagnosis is clinical, supported by blood tests, endoscopy, imaging and biopsy to differentiate from Crohn's disease, sarcoidosis, tuberculosis

- Ulcers;
- Facial or labial swelling;
- Lip fissures;
- Mucosal tags;
- 'Cobble-stone' proliferation of the mucosa;
- Gingival swelling and full-width granular gingivitis.

Table 2. Main features of OFG.

and foreign body reactions. Specialist care is usually indicated.

Management

Management is to eliminate allergens such as chocolate, nuts, cheese, cinnamaldehyde or food additives and treat lesions with intralesional corticosteroids or occasionally systemic clofazimine or sulfasalazine.

Useful websites

<http://www.emedicine.com/derm/topic72.htm>

Crohn's disease

Crohn's disease is a chronic inflammatory idiopathic granulomatous disorder. Many causal factors have been hypothesized but not proved. Crohn's disease affects mainly the small intestine (ileum) but can affect any part of the gastrointestinal tract, including the mouth.

About 10% of patients with Crohn's disease of the bowel have oral lesions. Oral lesions may be seen in the absence of any identifiable gut involvement and are the same as those seen in OFG – reddish raised lesions on the gingiva, hyperplastic folds of the oral mucosa (thickening and folding of the mucosa producing a 'cobble-stone type' of appearance, and mucosal tags), ulcers (classically linear vestibular ulcers with flanking granulomatous masses), facial swelling and angular cheilitis. There may also be features of gastrointestinal involvement, such as abnormal bowel movements, abdominal pain, rectal bleeding or weight loss.

Diagnosis

Oral biopsy, haematological, gastrointestinal and other investigations may be required in suspected Crohn's disease especially to exclude sarcoidosis. Specialist care is usually indicated. Histologically, the epithelium is intact but thickened, with epithelioid cells and giant cells surrounded by a lymphocytic infiltration.

Management

Topical or intralesional corticosteroids may effectively control

the oral lesions but more frequently systemic corticosteroids, azathioprine or salazopyrine are required.

Sarcoidosis

Sarcoidosis is a multi-system granulomatous disorder, of unclear aetiology, which most commonly affects young adult females, especially Afro-Caribbeans.

Sarcoidosis typically causes bilateral hilar lymphadenopathy, pulmonary infiltration and impaired respiratory efficiency, skin and eye lesions, but can involve virtually any tissue. Because of its vague and protean manifestations, sarcoidosis appears to be under-diagnosed. Gingival enlargement, or oral swellings may be seen but sarcoidosis can involve any of the oral tissues and has a predilection for salivary glands, causing asymptomatic enlargement of the major salivary glands and some have xerostomia. The association of salivary and lacrimal gland enlargement with fever and uveitis is known as uveoparotid fever (Heerfordt's syndrome).

Diagnosis

The most helpful investigations include:

- Chest radiography (for enlarged hilar lymph nodes);
- Raised levels of serum angiotensin-converting enzyme (SACE) in acute disease;
- A positive gallium or PET scan of lacrimal and salivary glands;
- Labial salivary gland biopsy (for histological evidence of non-caseating epithelioid cell granulomas).

Management

Patients with sarcoidosis but only minor symptoms often require no treatment. If there is active ocular disease, progressive lung disease, hypercalcaemia, or cerebral involvement or other serious complications, corticosteroids are given.

Patients to refer:

- Suspected malignancy in neck including lymphoma;
- Suspected metastatic disease in neck;
- Unexplained lymphadenopathy.