IN BRIEF

- Most red or hyperpigmented lesions in the mouth are inconsequential.
- However, cancer and some systemic diseases may present in this way.
- Most red lesions are inflammatory or atrophic but erythroplasia is potentially malignant.
- Most hyperpigmented lesions are racial or due to embedded material (eg amalgam tattoo) but malignant and systemic disease can present in this way.
- Biopsy may be indicated.

6

Oral Medicine — Update for the dental practitioner

Red and pigmented lesions

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This series provides an overview of current thinking in the more relevant areas of oral medicine for primary care practitioners, written by the authors while they were holding the Presidencies of the European Association for Oral Medicine and the British Society for Oral Medicine, respectively. A book containing additional material will be published. 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, or discussion of disorders affecting the hard tissues. 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 GDPs 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. Guidance on management and when to refer is also provided, along with relevant websites which offer further detail.

ORAL MEDICINE

1. Aphthous and other common ulcers
2. Mouth ulcers of more serious connotation
3. Dry mouth and disorders of salivation
4. Oral malodour
5. Oral white patches
6. Oral red and hyperpigmented patches
7. Orofacial sensation and movement
8. Orofacial swellings and lumps
9. Oral cancer
10. Orofacial pain

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RED AND PIGMENTED LESIONS

This article covers red lesions followed by hyperpigmentation.

RED ORAL LESIONS

Red oral lesions are commonplace and usually associated with inflammation in, for example, mucosal infections. However, red lesions can also be sinister by signifying severe dysplasia in erythroplasia, or malignant neoplasms (Table 1).

Geographic tongue (*erythema migrans*)

Geographic tongue (Fig. 1) is a very common condition and cause of sore tongue, affecting at least 1-2% of patients. There is a genetic background, and often a family history. Many patients with a fissured tongue (scrotal tongue) also have geographic tongue. Erythema migrans is associated with psoriasis in 4% and the histological appearances of both conditions are similar. Some patients have atopic allergies such as hay fever and a few relate the symptoms to various foods. A few have diabetes mellitus.

Clinical features

Geographic tongue typically involves the dorsum of the tongue, sometimes the ventrum. It is often asymptomatic but a small minority of patients complain of soreness; these patients are virtually invariably middle-aged. If sore, this may be noted especially with acidic foods (for example tomatoes or citrus fruits) or cheese.

There are irregular, pink or red depapillated maplike areas, which change in shape, increase in size, and spread or move to other areas sometimes within hours (Figs 2 and 3).

The red areas are often surrounded by distinct yellowish slightly raised margins. There is increased thickness of the intervening filiform papillae.

Fig. 1 Geographic tongue

Figs 2 and 3 Geographic tongue

Keypoints for patients: Denture sore mouth (denture-related stomatitis)

- Denture sore mouth is common, but rarely sore
- It is caused mainly by a yeast (Candida) that usually lives harmlessly in the mouth and elsewhere
- It is not transmitted to others
- It may be precipitated by prolonged wearing of a dental appliance, especially at night, which allows the yeast to grow
- It predisposes to sores at the corners of the mouth (angular cheilitis)
- It has no serious long-term consequences
- Blood tests, microbiological studies or biopsy may be required
- It is best controlled by:
  - leaving out the appliance, allowing the mouth to heal
  - cleaning the appliance (as below)
  - disinfecting the appliance (as per additional instructions)
  - using antifungal creams or gels regularly for up to four weeks
- The appliance may require adjustment or changing
- Keep the appliance as clean as natural teeth. Clean both surfaces (inside and outside) after meals and at night. Use washing-up liquid and a toothbrush and lukewarm water and hold it over a basin containing water, in case you drop it, which could cause it to break. Never use hot water, as it may alter the colour. A disclosing agent, for example Rayners Blue or Red food colouring (available at most supermarkets) can be applied with cotton buds, to help see whether you are cleaning the appliance thoroughly enough. If stains or calculus deposits are difficult to remove, try an overnight immersion (eg Dentural, Milton or Steradent), or an application of Denclen
- Dentures should be left out overnight, so that your mouth has a rest. It is not natural for your palate to be covered all the time and the chances of getting an infection are increased if the dentures are worn 24 hours a day. Ensure you leave the dentures out for at least some time and keep them in Dentural or Steradent, as they may distort if allowed to dry out
- Special precautions for dentures with metal parts: Denclen, Dentural and Milton may discolour metal, so use with care. Brush briefly to remove stains and deposits, rinse well with lukewarm water and do not soak overnight
- Before re-use, wash in water and brush the appliance to remove loosened deposits

Table 1 Most common causes of red lesions

Localised

Inflammatory lesions

- Geographic tongue
- Candidosis
- Lichen planus
- Drugs

Reactive lesions

- Pyogenic granulomas
- Peripheral giant cell granulomas

Atrophic lesions

- Geographic tongue
- Lichen planus
- Lupus erythematosus
- Erythroplasia
- Avitaminosis B12

Purpura

- Trauma
- Thrombocytopenia

Vascular

- Telangiectases (Hereditary haemorrhagic telangiectasia or scleroderma or post-irradiation ngiomas)

Neoplasms

- Squamous carcinoma
- Kaposi's sarcoma
- Giant cell tumour
- Wegener's granulomatosis

Generalised

Inflammatory lesions

- Most red lesions are inflammatory, usually geographic tongue (*erythema migrans*) (Figs 1 to 3)
- Viral infections (eg herpes simplex stomatitis)
- Fungal infections
- Candidosis
  - denture-related stomatitis, discussed below, is usually a form of mild chronic erythematous candidosis consisting of inflammation beneath a denture,orthodontic or other appliance (Fig. 4)
  - median rhomboid glossitis; a persistent red, rhomboidal depapillated area in the midline dorsum of tongue (Fig. 5)
  - acute oral candidosis; may cause widespread erythema and soreness sometimes with thrush, often a complication of corticosteroid or antibiotic therapy. Red lesions of candidosis may also be seen in HIV disease, typically in the palate (Fig. 6)
- Bacterial infections:
  - **Cancer treatment-related mucositis**; common after irradiation of tumours of the head and neck, or chemotherapy eg for leukaemia
  - **Immunological reactions** such as lichen planus, plasma cell gingivostomatitis, granulomatous disorders (sarcoidosis, Crohn's disease, orofacial granulomatosis), amyloidosis, and graft versus host disease
  - **A vitaminosis B or iron deficiency or folate deficiency**

Diagnosis

The diagnosis of geographic tongue is clinical mainly from the history of a migrating pattern and the characteristic clinical appearance. Blood examination may rarely be necessary to exclude diabetes, or anaemia if there is confusion with a depapillated tongue of glossitis.

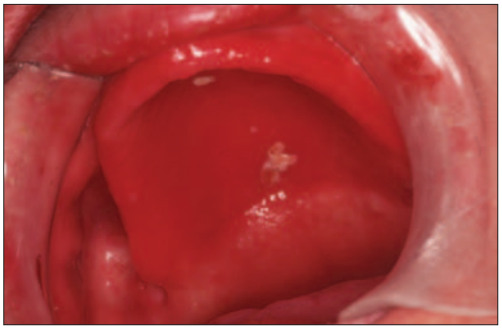

Fig. 4 Candida-associated denture stomatitis

Fig. 5 Median rhomboid glossitis

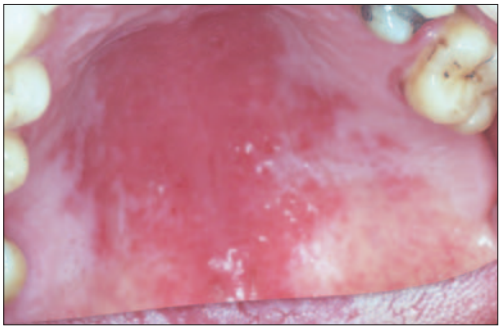

Fig. 6 Erythematous candidosis

Management

Reassurance remains the best that can be given. Zinc sulphate 200mg three times daily for three months or a topical rinse with 7% salicylic acid in 70% alcohol are advocated by some and may occasionally help.

Patient information and websites

http://www.usc.edu/hsc/dental/opath/Cards/GeographicTongue.html
http://www.worlddent.com/2001/05/series/ncut-tic1_2.xml

DENTURE-RELATED STOMATITIS (DENTURE-INDUCED STOMATITIS; DENTURE SORE MOUTH; CHRONIC ERYTHEMATOUS CANDIDOSIS)

Denture-related stomatitis consists of mild inflammation of the mucosa beneath a denture – usually a complete upper denture. This is a common condition, mainly of the middle-aged or elderly, more prevalent in women than men.

Aetiopathogenesis

Dental appliances (mainly dentures) especially when worn throughout the night, or a dry mouth, favour development of this infection. It is not caused by allergy to the dental material (if it were, it would affect mucosae other than just that beneath the appliance).

However, it is still not clear why only some denture wearers develop denture-related stomatitis, since most patients appear otherwise healthy.

Dentures can produce a number of ecological changes; the oral flora may be altered and plaque collects between the mucosal surface of the denture and the palate.

The accumulation of microbial plaque (bacteria and/or yeasts) on and attached to the fitting surface of the denture and the underlying mucosa produces an inflammatory reaction. When candida is involved, the more common terms 'candida-associated denture stomatitis', 'denture-induced candidosis' or 'chronic erythematous candidosis' are used.

In addition, the saliva that is present between the maxillary denture and the mucosa may have a lower pH than usual. Denture-related stomatitis is sometimes associated also with various bacteria but is not exclusively associated with infection, and occasionally mechanical irritation is at play.

Clinical features

The characteristic presenting features of denture-related stomatitis are chronic erythema and oedema of the mucosa that contacts the fitting surface of the denture (Fig. 2). Uncommon complications include:

- Angular stomatitis
- Papillary hyperplasia in the vault of the palate.

Classification

Denture-related stomatitis has been classified into three clinical types (Newton's types), increasing in severity:

- A localised simple inflammation or a pinpoint hyperaemia (Type I)
- An erythematous or generalised simple type presenting as more diffuse erythema involving part of or the entire, denture-covered mucosa (Type II)
- A granular type (inflammatory papillary hyperplasia) commonly involving the central part of the hard palate and the alveolar ridge (Type III).

Diagnosis

Denture-related stomatitis is a clinical diagnosis although it may be confirmed by microbiological investigations. In addition haematological and biochemical investigations may be appropriate to identify any underlying predisposing factors such as nutritional deficiencies, anaemia and diabetes mellitus in patients unresponsive to conventional management.

Management

The denture plaque and fitting surface is infested with micro-organisms, most commonly *Candida albicans* and therefore, to prevent recurrence, dentures should be left out of the mouth at night, and stored in an appropriate antiseptic which has activity against yeasts (Table 2).

Table 2 Management of denture-related stomatitis

- Denture hygiene measures
- Antifungal therapy (eg topical or systemic)
- If unresponsive to above, investigate for underlying predisposing factors

Cleansers containing alkaline hypochlorites, disinfectants, or yeast lytic enzymes are most effective against candida. Denture soak solution containing benzoic acid is taken up into the acrylic resin and can completely eradicate *C.albicans* from the denture surface. Chlorhexidine gluconate can also eliminate *C.albicans* on the denture surface and a mouthwash can reduce the palatal inflammation.

The mucosal infection is eradicated by brushing the palate with chlorhexidine mouthwash or gel, and using miconazole gel, nystatin pastilles, amphotericin lozenges or fluconazole, administered concurrently with an oral antiseptic such as chlorhexidine which has antifungal activity.

Patient information and website

http://www.emedicine.com/derm/topic642.htm

Neoplastic lesions; red neoplasms include:

- Peripheral giant cell tumours
- Angiosarcomas such as Kaposi's sarcoma—a common neoplasm in HIV/AIDS, appears in the mouth as red or purplish areas or nodules especially seen in the palate
- Squamous cell carcinomas
- Wegener's granulomatosis.

Vascular anomalies (angiomas and telangiectasia) include:

- Dilated lingual veins (varices) may be conspicuous in normal elderly persons
- Haemangiomas are usually small isolated developmental anomalies, or hamartomas (Figs 7-9)
- Telangiectasias — dilated capillaries — may be seen after irradiation and in disorders such as hereditary haemorrhagic telangiectasia and systemic sclerosis (Fig. 10)
- Angiomas are benign and usually congenital (Figs 7-10). In general most do not require any active treatment unless symptoms develop, in which case they can be treated by injection of sclerosing agents, cryosurgery, laser excision or surgical excision.

Vesiculobullous disorders

Erythema multiforme, pemphigoid and pemphigus may present as red lesions (see article two), especially localised oral purpura, which presents with blood blisters (Fig. 11). Specialist referral is usually indicated.

Reactive lesions

Reactive lesions that can be red are usually per-

Keypoints for dentists: Denture-related stomatitis

- Denture related stomatitis is caused mainly by a yeast (Candida) but bacteria may also be involved
- It may be precipitated by prolonged wearing of a dental appliance, especially at night
- It predisposes to angular cheilitis
- It is best controlled by:
  - leaving out the appliance, allowing the mouth to heal
  - disinfecting the appliance using antifungal creams or gels (eg miconazole), pastilles/lozenges (eg nystatin, amphotericin) or capsules (fluconazole) regularly for up to four weeks
- The appliance may require adjustment or changing
- Blood tests, microbiological studies or biopsy may be required if the lesion is unresponsive

Keypoints for patients: Geographic tongue

- This is a common condition
- The cause is unknown
- It may be inherited from parents
- There may be an allergic component
- It is not thought to be infectious
- It is associated, rarely, with psoriasis
- It has no long-term consequences

Keypoints for dentists: Geographic tongue

- The cause is unknown but it may be inherited
- It resembles, and is associated rarely with, psoriasis
- It has no long-term consequences
- There is no cure and treatment and is therefore aimed at controlling symptoms and reassuring the patient

Keypoints for dentists: Single hyperpigmented lesions

- If the lesion could be an amalgam tattoo, take a radiograph
- If the lesion is radio-opaque, it is probably a tattoo and should be left alone
- If the lesion is not radio-opaque, or if it was not initially considered likely to be an amalgam tattoo, biopsy it

Fig. 7 Vascular hamartoma (haemangioma) tongue

Fig. 8 Vascular hamartoma (haemangioma, palate)

Fig. 9 Haemangioma in floor of mouth

Fig. 10 Telangiectasia, lips and tongue

Fig. 11 Angina bullosa haemorrhagica

Fig. 12 Pyogenic granuloma, lower lip

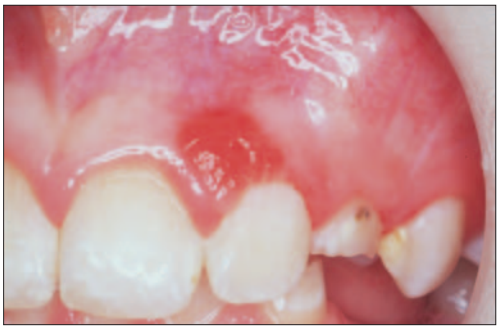

Fig. 13 Pyogenic epulis

sistent soft lumps (Figs 12 and 13) which include:

- Pyogenic granulomas
- Peripheral giant cell granulomas

Specialist referral is usually indicated.

Atrophic lesions

The most important red lesion is erythroplasia, since it is often dysplastic (see below). Geographic tongue also causes red lesions (see above), desquamative gingivitis is a frequent cause of red gingivae, almost invariably caused by lichen planus or pemphigoid, and iron or vitamin deficiency states may cause glossitis (Fig. 14) or other red lesions.

ERYTHROPLAKIA (ERYTHROPLASIA)

Erythroplasia is a rare condition defined as 'any lesion of the oral mucosa that presents as bright red velvety plaques which cannot be characterised clinically or pathologically as any other recognisable condition'.

Mainly seen in elderly males, it is far less common than leukoplakia, but far more likely to be dysplastic or undergo malignant transformation.

Clinical features

Erythroplakia is seen most commonly on the soft palate, floor or mouth or buccal mucosa. Some erythroplakias are associated with white patches, and are then termed speckled leukoplakia (Fig. 15).

Diagnosis

Biopsy to assess the degree of epithelial dysplasia and exclude a diagnosis of carcinoma.

Prognosis

Erythroplasia has areas of dysplasia, carcinoma *in situ*, or invasive carcinoma in most cases.

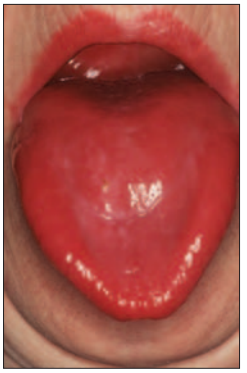

Fig. 14
Atrophic glossitis

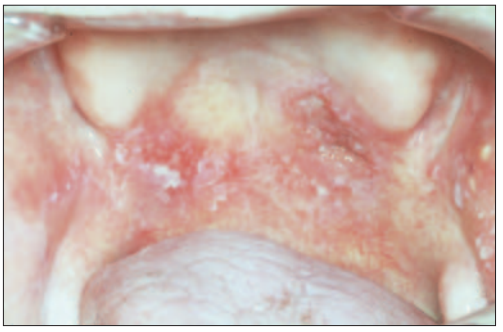

Fig. 15 Erythroplasia in soft palate complex

Carcinomas are seen 17 times more often in erythroplakia than in leukoplakia and these are therefore the most potentially malignant of all oral mucosal lesions.

Management

Erythroplastic lesions are usually (at least 85%) severely dysplastic or frankly malignant. Any causal factor such as tobacco use should be stopped, and lesions removed. There is no hard evidence as to the ideal frequency of follow-up, but it has been suggested that patients with mucosal potentially malignant lesions be re-examined within one month, at three months, at six months, at 12 months and annually thereafter.

PURPURA

This presents as bleeding into the skin and mucosa and is usually caused by trauma. Occasional small petechiae are seen at the occlusal line in perfectly healthy people.

Thrombocytopenia can result in red or brown pinpoint lesions (petechiae) or diffuse bruising (ecchymoses) at sites of trauma, such as the palate. Suction (eg fellatio) may produce bruising in the soft palate). Localised oral purpura or angina bullosa haemorrhagica is an idiopathic, fairly common cause of blood blisters, often in the soft palate, in older persons (Fig. 11). Sometimes the use of a corticosteroid inhaler precipitates this.

Diagnosis of red lesions

Diagnosis of red lesions is mainly clinical but lesions should also be sought elsewhere, especially on the skin or other mucosae.

It may be necessary to take a blood picture (including blood and platelet count), and assess haemostatic function or exclude haematinic deficiencies. Other investigations needed may include other haematological tests and/or biopsy or imaging.

Management

Treatment is usually of the underlying cause, or surgery.

HYPERPIGMENTATION

Oral mucosal discolouration may be superficial (extrinsic) or due to deep (intrinsic – in or beneath mucosa) causes and ranges from brown to black.

Extrinsic discolouration is rarely of consequence and is usually caused by:

- Habits such as tobacco or betel use
- Coloured foods or drinks, (such as liquorice, beetroot, red wine, coffee, tea)
- Drugs (such as chlorhexidine, iron salts, crack cocaine, minocycline, bismuth subsalicylate, and lansoprazole).

Fig. 16 Black hairy tongue

Black hairy tongue

This is one extrinsic type of discolouration seen especially in patients on a soft diet, smokers, and those with dry mouth or poor oral hygiene (Fig. 16).

The best that can usually be done is to avoid the cause where known, and to advise the patient to brush the tongue or use a tongue-scraper.

Intrinsic discolouration

This may have much more significance (Table 3). Localised areas of pigmentation may be caused mainly by:

- **Amalgam tattoo** (embedded amalgam). Typically this is a single blue-black macule in the

Table 3 Main causes of intrinsic mucosal hyperpigmentation

Localised

- Amalgam or other tattoo
- Naevus
- Melanotic macule
- Neoplasms (eg malignant melanoma or Kaposi's sarcoma)
- Pigmentary incontinence
- Peutz-Jegher's syndrome

Generalised

- Racial pigmentation
- Localised irritation, eg tobacco or betel
- Drugs, eg antimalarials
- Pregnancy/oral contraceptive pill
- Addison's disease (hypoadrenocorticism)

Fig. 17 Amalgam tattoo

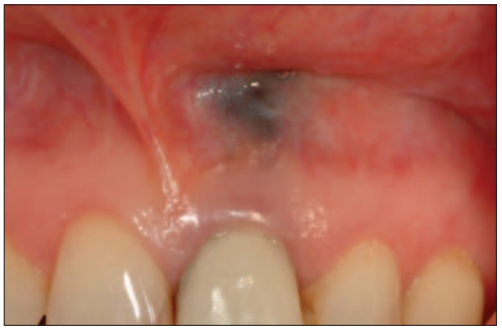

Fig. 18 Amalgam tattoo

Fig. 19 Melanotic macule, lower labial mucosa

Fig. 20 Smoking-induced melanosis, buccal mucosa

Fig. 21 Racial pigmentation

mandibular gingiva close to the scar of an apicectomy (Figs 17 and 18) or where amalgam has accidentally been introduced into a wound, is painless, and does not change in size or colour. A lesion suspected to be an amalgam tattoo is best radiographed first to see if there is radio-opaque material present, though not all are radio-opaque. If the lesion is not radio-opaque, it is best biopsied to exclude naevi or melanoma. Similar lesions can be caused by other foreign bodies (eg graphite tattoo), local irritation or inflammation.

- **Naevi** are blue-black often papular lesions formed from increased melanin-containing cells (naevus cells) seen particularly on the palate. They are best removed to exclude melanoma.

- **Pigmentary incontinence** may be seen in some inflammatory lesions such as lichen planus, especially in smokers (Fig. 20).

- **Melanotic macules** are usually flat single brown, collections of melanin-containing cells, seen particularly on the vermilion border of the lip and on the palate (Fig. 19). They are best removed to exclude melanoma.

- **Malignant melanoma** is rare, seen usually in the palate or maxillary gingivae. Features suggestive of malignancy include a rapid increase in size, change in colour, ulceration, pain, the occurrence of satellite pigmented spots or regional lymph node enlargement. Incisional biopsy to confirm the diagnosis followed by radical excision is indicated.

- **Kaposi's sarcoma** is usually a purple lesion seen mainly in the palate or gingival of HIV-infected and other immunocompromised persons.

Generalised pigmentation, often mainly affecting the gingivae, is common in persons of colour, and is racial and due to melanin. Seen mainly in black and ethnic minority groups it can also be noted in some fairly light-skinned people (Fig. 21). Such pigmentation may be first noted by the patient in adult life and then incorrectly assumed to be acquired.

In all other patients with widespread intrinsic pigmentation, systemic causes should be excluded. These may include:

- Tobacco, which can also cause intrinsic hyperpigmentation (smoker's melanosis)
- Antimalarials, oral contraceptive pill, anticonvulsants, minocycline, phenothiazines, gold, busulphan and other drugs
- Heavy metals (such as mercury, lead and bismuth) not used therapeutically now, rarely cause industrial exposure etc
- Pregnancy
- Hypoadrenalism (Addison's disease). Hyperpigmentation in this is generalised but most obvious in normally pigmented areas (eg the nipples, genitalia), skin flexures, and sites of trauma. The mouth may show patchy hyperpigmentation. Patients also typically have weakness, weight loss, and hypotension.

Diagnosis

The nature of oral hyperpigmentation can sometimes only be established after further investigation.

In patients with localised hyperpigmentation, in order to exclude melanoma, radiographs may be helpful (they can sometimes show a foreign body) and biopsy may be indicated, particularly where there is a solitary raised lesion, a rapid increase in size, change in colour, ulceration, pain, evidence of satellite pigmented spots or regional lymph node enlargement. If early detection of oral melanomas is to be achieved, all pigmented oral cavity lesions should be viewed with suspicion. The consensus of opinion is that a lesion with clinical features as above seriously suggestive of malignant melanoma, are best biopsied at the time of definitive operation.

In patients with generalised or multiple hyperpigmentation, specialist referral is indicated.

Management

Management is of the underlying condition.

Patients to refer

Erythroplasia/erythroplakia — in view of high risk of malignant transformation

Squamous carcinoma

Isolated brown or black lesions of suspect aetiology

Generalised or multiple hyperpigmentation

Kaposi's sarcoma

Wegener's granulomatosis in view of associated systemic disease