

# Orofacial Disease: Update for the Clinical Team: 9. Orofacial Pain

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**Abstract:** Orofacial pain, the main reason why many patients seek dental advice, usually has a local cause—primarily the sequelae of dental caries—but a wide range of diseases, particularly neurological, psychogenic and vascular disorders, can cause orofacial pain. This article will discuss disorders that can present with pain and the neurological, psychogenic and vascular causes of orofacial pain.

The first article in this series made several general observations on diagnosis and treatment which should be borne in mind in relation to the material presented here.

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**Clinical relevance:** Orofacial pain is the main presenting complaint of many patients.

Orofacial pain is the main reason why many patients seek dental advice. This usually has a local cause, mainly the sequelae of dental caries. However, a wide range of diseases, particularly neurological, psychogenic and vascular disorders, can cause orofacial pain (these are summarized in Table 1).

## LOCAL CAUSES

### Temporomandibular Joint

Pain from the temporomandibular joint may result from dysfunction, acute inflammation, trauma, and, rarely, primary or secondary malignant tumours or can be referred. It is usually intensified by movement of the mandible; the joint may be tender to

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palpation via the external auditory meatus. When acutely inflamed, the joint may appear swollen and warm to touch. A splinting protective mechanism by the masticatory muscles may result in muscle spasm, producing secondary pain and trismus.

### Salivary Glands

Pain from the salivary glands is localized, may be quite severe and may be intensified by increased saliva production such as occurs before and with meals. The affected gland may be swollen and tender to palpation. In acute parotitis, mouth opening causes severe pain and thus some trismus, and there may be fever and malaise. Salivary flow from the affected gland is usually reduced. In children, the most common cause of salivary pain is mumps. In adults, pain from salivary glands results usually from blockage of a salivary duct by calculus or a mucus plug.

### Sinuses and Pharynx

Disease of the paranasal sinuses and nasopharynx can cause orofacial pain. In

acute sinusitis a cold is often followed by local pain and tenderness (but not swelling) and radio-opacity of the affected sinuses, sometimes with an obvious fluid level. Pain may be aggravated by change of position of the head. With maxillary sinusitis, pain may be felt in related upper molars, which may be tender to percussion. The pain of ethmoidal or sphenoidal sinusitis is deep in the root of the nose. Tumours can also cause orofacial pain by infiltrating branches of the trigeminal nerve.

### Eyes

Disorders of refraction, retrobulbar neuritis or glaucoma can cause pain, which may radiate to the orbit or frontal region.

### Ears

Middle-ear disease may cause headaches.

#### Local causes:

Various orofacial lesions

#### Neurological disorders:

Trigeminal neuralgia  
Malignant neoplasms involving the trigeminal nerve  
Glossopharyngeal neuralgia  
Herpes zoster (including post-herpetic neuralgia)

#### Psychogenic causes:

Atypical facial pain and other oral symptoms

#### Vascular disorders:

Migraine  
Migrainous neuralgia  
Giant cell arteritis

#### Referred pain:

Angina, nasopharyngeal, ocular and aural disease  
Chest disease (rare)

**Table 1.** Causes of orofacial pain.

Dental surgeon	Ancillary, Hygienist, Nurse
Refer to specialist. Understand disease and management in order to extend education of, and reassure, patient	Understand disease and management in order to extend education of, and reassure, patient
Alert specialist to any possible adverse effects of treatment	Oral health education of patient
Oral healthcare; in particular to avoid causes of pain	Avoid any trigger zones
Oral health education of patient	Alert dental surgeon to any changes, or possible adverse effects of treatment
Avoid any trigger zones	
Avoid drug interactions with carbamazepine or other agents	

**Table 2.** Roles of the dental clinical team in the management of a patient with trigeminal neuralgia.

**Neck**

Neck pain, usually from cervical spondylosis, occasionally causes pain to be referred to the face.

**NEUROLOGICAL CAUSES**

Sensory innervation of the mouth, face and scalp depends on the trigeminal nerve, and disease affecting this nerve can cause orofacial pain or sensory loss—or, indeed, both.

Severe orofacial pain suggestive of trigeminal neuralgia but with physical signs such as facial sensory or motor impairment can result from:

- cerebrovascular disease;
- multiple sclerosis;
- infections such as HIV; or
- neoplasms.

**Neuralgia with no Apparent Organic Cause**

Such conditions have many names: idiopathic trigeminal neuralgia, trigeminal neuralgia, benign paroxysmal trigeminal neuralgia, tic douloureux.

Trigeminal neuralgia is the most common neurological cause of orofacial pain. It is, however, rare and seen mainly in middle-aged or older patients.

**Aetiology**

The cause is unclear, but trigeminal neuralgia may be due to an

atherosclerotic blood vessel pressing on the roots of the trigeminal nerve.

**Clinical Features**

Trigeminal neuralgia has the following main characteristics.

*Pain* which is:

- severe;
- of abrupt onset and termination;
- electric shock-like, brief, stabbing (lancinating);
- unilateral;
- restricted to the trigeminal nerve distribution.

The pain usually involves the mandibular and, rarely, the other divisions of the trigeminal nerve.

In some patients the pain is triggered. The trigger site may bear no relation to the painful area, but is always ipsilateral to the pain. Patients do not necessarily recognize the trigger for what it is, and may find that pain is brought on by chewing, talking, swallowing, smiling or temperature change—usually exposure to cold air.

**Pain-free Intervals Between Attacks**

This is often an intermittent disease, with apparent remissions for months or years. However, recurrence is common. Very often the pain spreads to involve a wider area over time and the intervals between episodes tend to shorten.

**Lack of Neurological Abnormality**

There is no sensory loss in the

trigeminal region; nor are other neurological abnormalities present. Neurological assessment is needed because similar pain is secondary to multiple sclerosis, tumours, neurosyphilis, HIV infection and other lesions.

**Diagnosis and Management**

Patients with trigeminal neuralgia are ideally seen at an early stage by a specialist in order to confirm the diagnosis and initiate treatment (Tables 2 and 3).

Medical treatment, typically using anticonvulsants, is successful for most patients. Carbamazepine (Tegretol) is still the main agent used. It must be given continuously prophylactically for long periods. However, it is *not* an analgesic and, if given when an attack starts, will not relieve the pain. Carbamazepine must be used carefully and under strict medical surveillance because it can have a range of adverse effects, particularly affecting balance, blood cells, blood pressure and liver function. Typically, the dose is increased to try to control the pain while at the same time trying to avoid ataxia and other adverse effects. If carbamazepine fails, phenytoin or baclofen or other drugs are occasionally useful.

If medical treatment fails or the adverse drug effects are too pronounced, surgery may be required. Injections of local analgesic will temporarily block the pain. Local cryosurgery to the

- This is an uncommon disorder
- The cause is unknown but involves spontaneous activity of pain nerves
- It is not inherited
- It is not known to be infectious
- Similar symptoms may be seen in some neurological conditions (which we will exclude)
- There are usually no long-term consequences
- X-rays and blood tests may be required
- Symptoms may be controlled but not cured by drugs with an anticonvulsant action
- Uncontrolled pain may be treated by freezing the nerve, or by surgery

**Table 3.** Patient information sheet: trigeminal neuralgia.

trigeminal nerve branches involved (cryoanalgesia) can produce analgesia without permanent anaesthesia, but the benefit can usually be measured only in months rather than years.

For intractable cases neurosurgery, such as destruction of the trigeminal ganglion (radiofrequency ganglionolysis) or decompression of the trigeminal nerve, may be required. Unfortunately, pain is exchanged for anaesthesia and risk of damage to the cornea and, occasionally, continuous anaesthesia but with pain (anaesthesia dolorosa).

### Glossopharyngeal Neuralgia

Glossopharyngeal neuralgia affecting the throat and ear is *much* less common than trigeminal neuralgia but the pain is similar, and typically triggered by swallowing or coughing. Occasionally it is secondary to a tumour. Carbamazepine is used but adequate relief of pain can be difficult to obtain.

### Herpetic and Post-herpetic Neuralgia

Herpes zoster (shingles) is often preceded and accompanied by neuralgia, and post-herpetic neuralgia can cause a continuous burning pain that may be so intolerable that the patient contemplates suicide. Specialist advice is required.

## PSYCHOGENIC CAUSES OF OROFACIAL PAIN

### Tension Headaches

Tension headaches are not uncommon stress-related pains in the forehead, temple and/or neck, seen mainly in young adults.

#### Aetiology

Tension headaches are caused by anxiety or stress-induced muscle tension, presumably because the accumulation of metabolites in the tense muscles produces pain.

#### Clinical Features

The pain affects the upper face (frontal or temporal muscles) or neck (occipital muscles), and not the mouth. Typically it is felt as a constant ache or band-like pressure, often worsening towards the evening. However, tension headaches do not waken the patient in the night.

#### Management

Reassurance may be effective, but the pain may be helped by relaxation or anxiolytics such as a little alcohol or benzodiazepines. A change to a more relaxed lifestyle may be indicated.

### Psychogenic Orofacial Pains

#### Aetiology

The mouth is concerned intimately with the psychological development of the

- This is fairly common
- The cause is not completely known
- It is not inherited
- It may be caused by increased nerve sensitivity
- There may be a background of stress
- There are usually no serious long-term consequences
- X-rays and blood tests may be required
- Treatment takes time and patience; some nerve-calming drugs can help

**Table 5.** Patient information sheet: atypical facial pain.

individual, and disorders of structures such as the lips, teeth, tongue and oral mucosa can hold enormous emotional significance. It may be for these reasons, therefore, that there are a range of types of orofacial pain for which an organic cause cannot be identified even with sophisticated modern techniques, and which are thought to have a psychogenic basis. It must be stressed that such a diagnosis should be made only where there has been very careful exclusion of organic disease.

Psychogenic orofacial pain can be seen in:

- normal persons under stress;
- people with a personality trait, such as hypochondriasis;
- neurotic, often depressed persons;
- psychotic patients.

#### Clinical Features

The following features are common to patients suffering psychogenic oral pains:

- the pain is chronic;
- the pain is often of a constant dull boring or burning type;
- there may be ill-defined localization;
- the symptoms do not waken the patient from sleep;
- objective signs and all investigations are negative;
- the patient often appears otherwise quite well;
- adverse life-events, such as bereavement or family illness, may precede the onset of pain;
- multiple oral complaints, such as dry mouth or bad taste, are common;
- other psychogenic related complaints, such as headaches, chronic back

Dental surgeon	Ancillary, Hygienist, Nurse
Understand disease and management in order to extend education of, and reassure, patient	Understand disease and management in order to extend education of, and reassure, patient
Exclude organic causes of pain.	Oral health education of patient
Initiate treatment with antidepressants or refer to specialist	Alert dental surgeon to any changes, or possible adverse effects of treatment
Be alert to any possible adverse effects of treatment	
Oral healthcare; in particular to avoid causes of pain and unnecessary operative intervention	
Oral health education of patient	
Avoid drug interactions with tricyclic or other agents	

**Table 4.** Roles of the dental clinical team in the management of a patient with atypical orofacial pain.

- Denture problems
- Deficiencies of vitamins B, folic acid or iron
- Mucosal disorders:
  - Erythema migrans (geographic tongue)
  - Lichen planus
  - Infections (candidosis)
- Diabetes mellitus
- Xerostomia
- Psychogenic:
  - Cancerophobia
  - Depression
  - Anxiety states
  - Hypochondriasis
- Drugs

**Table 6.** Causes of burning mouth.

pains, irritable bowel syndrome or dysmenorrhoea, are common;

- few of those affected seem to try or persist in using analgesics;
- many patients are middle-aged, often older women;
- cure is unlikely;
- multiple consultations are common.

**Management**

Many patients need to see a specialist because psychiatric assessment may be helpful. Some patients respond to antidepressants such as dothiepin, but others refuse psychiatric help or medication.

**Atypical Facial Pain**

This term is given to the chronic orofacial pain seen mainly in older women, for which no organic cause can be found.

**Aetiology**

Over 50% of such patients are depressed or hypochondriacal, and some have lost or been separated from parents in childhood. Many lack insight and will persist in blaming organic diseases for their pain.

**Clinical Features**

Features in addition to those mentioned above include the following:

- a dull, continuous ache;
- pain is usually in the upper jaw;
- often restorative procedures and/or

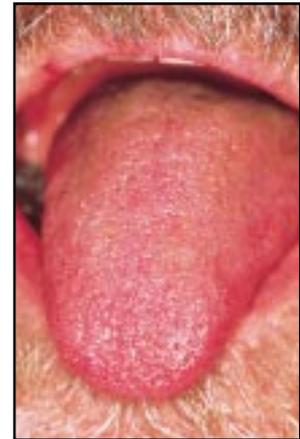
exodontia have been attempted, in vain.

**Management**

Attempts at relieving pain by restorative treatment, endodontia or exodontia are usually unsuccessful but the patient may blame the dental surgeon for the problem. The dental team can help in several ways, particularly by offering reassurance (Table 4), but many patients need to see a specialist for psychiatric assessment. Patients must be kept informed about the condition (Table 5). Some patients respond to antidepressants such as dothiepin, but others refuse psychiatric help or medication.

**Burning Mouth**

This condition is also known as glossopyrosis, glossodynia, oral dysaesthesia. It is a common chronic complaint, seen especially in middle-aged or elderly women, who typically complain of a burning sensation in the tongue.



**Figure 1.** Oral dysaesthesia: the tongue often looks normal.

**Aetiology**

The condition may result from restricted tongue space from poor denture construction, or parafunction such as tongue-thrusting, in about 50% of cases. A psychogenic cause such as anxiety, depression or cancerophobia is present in about 20%. Systemic problems such as a haematological deficiency state are found

Type	Symptom pattern	Other features
1	No BMS on waking, but increases during the day	Unremitting
2	BMS on waking and through the day	Unremitting
3	No regular pattern	May remit

**Table 7.** Types of burning mouth syndrome (BMS).

Dental surgeon	Ancillary, Hygienist, Nurse
Understand condition and management in order to extend education of, and reassure, patient	Understand condition and management in order to extend education of, and reassure, patient
Exclude organic disease	Oral health education of patient
Initiate treatment or refer to specialist	Alert dental surgeon to any changes, or possible adverse effects of treatment
Be alert to any possible adverse effects of treatment	
Oral healthcare; in particular to avoid causes of pain. Treat any candidosis.	
Oral health education of patient	
Avoid drug interactions with tricyclic or other agents	

**Table 8.** Roles of the dental clinical team in the management of a patient with burning mouth syndrome.

- This is a common condition
- The cause is not usually known but it may be a nerve hypersensitivity
- It is not inherited
- It is not infectious
- It may occasionally be caused by some mouth conditions, deficiencies, diabetes or drugs
- It has no long-term consequences
- Blood tests or biopsy may be required
- Burning mouth syndrome may be controlled by some nerve-calming drugs

**Table 9.** Patient information sheet: burning mouth syndrome.

in about 30% of patients. Denture allergy is remarkably rare (Table 6).

*Clinical Features*

The burning sensation is usually bilateral and often relieved by eating and drinking, in contrast to pain caused by organic lesions which is typically made worse by food. Burning mouth ‘syndrome’ most frequently affects the tongue. It may also affect the palate and, less commonly, the lips or lower alveolus. There are no clinically detectable signs of mucosal disease (Figure 1). Three types have been described (see Table 7): type 2 is most common, type 3 least common.

*Diagnosis and Management*

Oral examination is important to exclude organic causes of discomfort such as deficiency states, glossitis, erythema

migrans (geographic tongue), candidosis or lichen planus (these conditions were described fully in article 6 of this series: *Dent Update* 1999; **26**: 254-259).

Laboratory screening for anaemia, a vitamin or iron deficiency ( blood tests), diabetes (blood and urine analyses), xerostomia (salivary flow rates) or candidosis (oral rinse) may be indicated, as may psychogenic assessment, and thus specialist referral may be warranted.

Reassurance, and occasionally psychiatric care, are indicated (Tables 8 and 9).

**Temporomandibular Pain-Dysfunction Syndrome**

Temporomandibular pain-dysfunction syndrome (TMPD; also called myofascial pain-dysfunction or facial arthromyalgia) is the term given to symptoms such as discomfort, limited opening and/or click related to the temporomandibular joint. It is seen mainly in young adult women in whom no organic cause can be reliably identified.

*Aetiology*

The cause is not clear and has been variously attributed to:

- trauma;
- occlusal abnormalities;

- This is a common condition
- It seems to be related to stress, damage or habits involving the teeth and joints
- It is not inherited
- There are no serious long-term consequences: arthritis does not result
- The symptoms usually clear spontaneously after some months
- Various treatments such as rest, exercises, drugs, splints, or adjustments to the teeth may help

**Table 11.** Patient information sheet: TMPD.

- habits; or
- stress.

In any event, the underlying cause of discomfort appears to be muscle tension and an ischaemic type of pain.

*Clinical Features*

TMPD refers to any or all of the triad of:

- pain (typically mild and dull and over one side of the face or joint but can radiate elsewhere);
- limitation of jaw opening (jaw opening is not always limited but in some there may even be locking); and
- clicking from the temporomandibular joint (clicking or crepitus may be heard on opening or closing the mouth).

There appear to be no long-term sequelae to TMPD such as arthritis.

*Diagnosis and Management (Tables 10 and 11)*

In all cases, organic disease must first be carefully excluded: similar manifestations have been seen in malignant disease, for example. There is no defined treatment, and therapies range from rest through to the use of anxiolytics, antidepressants, analgesics, exercises, short-wave diathermy and even acupuncture, lasers or surgery.

In the absence of any evidence that intervention is indicated or significantly effective, it seems prudent to counsel rest, and possibly use an occlusal splint at night in the first instance. Certainly most patients respond well to this regimen.

Dental surgeon	Ancillary, Hygienist, Nurse
Understand condition and management in order to extend education of, and reassure, patient	Understand condition and management in order to extend education of, and reassure, patient
Exclude organic disease	Oral health education of patient, in particular to avoid parafunctional habits
Initiate treatment. Construct occlusal splints, and undertake occlusal rehabilitation as indicated.	Alert dental surgeon to any changes, or possible adverse effects of treatment
Be alert to any possible adverse effects of treatment	
Oral healthcare; in particular to avoid causes of pain or occlusal disharmony	
Oral health education of patient	
Avoid drug interactions with tricyclic or other agents	

**Table 10.** Roles of the dental clinical team in the management of a patient with TMPD.

	Dental	Periodontal	Mucosal	Salivary glands	Neuralgic	Vascular	TMPD	Psychogenic
Site	Mouth, ear, jaws, cheek	Tooth	Mucosa	Area of gland	Nerve distribution	Orbit or upper face	Temple, ear, jaws, teeth	Diffuse, deep, sometimes across midline
Localization	Poor, diffuse, radiating, does not cross midline	Good	Usually good	Usually good	Good	Usually good	Poor, but usually unilateral	Poor
Duration	Seconds to days	Hours to days	Hours to days	Hours to days	Seconds	Minutes to hours	Weeks to years	Weeks to years
Character of pain	Intermittent, sharp, paroxysmal	Steady, boring	Burning or sharp	Drawing, pulling	Lancinating, paroxysmal	Throbbing, deep	Dull, continuous	Dull, boring, continuous
Precipitating factors	Heat and cold	Chewing	Sour and spicy foods	Eating	Touch, wind	Alcohol	Yawning, chewing	Stress, fatigue
Associated signs	Caries, exposed dentine	Abscess	Erosions or ulcers	Salivary gland swelling	None usually	Lacrimation, injected eye, nasal discharge	Click in TMJ, trismus	None
Aetiological factors	Caries, trauma, cracked tooth, gingival recession	Acute periodontitis	Varied	Saliva, retention, infection	Idiopathic, multiple sclerosis	Vasomotor	Stress, parafunction	Depression
Treatment	Restoration, endodontics	Periodontics or extraction	According to cause	Drainage, antibiotics	Carbamazepine, nerve block, cryoanalgesia, neurosurgery	According to cause (Table 13)	Antidepressants, other treatments	Antidepressants

Table 12. Differential diagnosis of orofacial pain.

### Atypical Odontalgia

Pain and hypersensitivity in teeth, indistinguishable from pulpitis or periodontitis but occurring in the absence of detectable pathology, and aggravated by dental intervention, characterize this disorder. It is probably a variant of atypical facial pain, and should be treated similarly.

### The Syndrome of Oral Complaints

Multiple pains and other complaints such as dry mouth or bad taste may occur simultaneously or sequentially in this condition, and patients may bring diaries of their symptoms to emphasize their problem. This has been termed the ‘maladie du petite papier’, and though there is not always a psychogenic basis, such notes characterize patients with non-organic complaints. Relief is rarely admitted. Probably a variant of atypical

facial pain, it should be treated similarly.

### VASCULAR CAUSES

Orofacial pain is occasionally caused by disorders in which the most obvious organic feature is vascular dilatation or constriction. However, the pain is usually more obviously in the face or head than in the mouth (see Tables 12 and 13).

#### Migraine

Migraine is an uncommon severe headache associated with nausea and sometimes photophobia, seen mainly in adult women.

#### Aetiology

Migraine headache is probably related to arterial dilatation. Attacks may be precipitated by a number of factors,

including:

- alcohol;
- various tyramine-containing foods such as ripe bananas, some red wines or chocolate;
- the contraceptive pill;
- stress.

#### Clinical Features

Classical migraine has the following features:

- preceding warning symptoms (an ‘aura’) of visual, sensory, motor or speech disturbances. Visual phenomena are often of zig-zag coloured lights (fortification spectra) or transient visual defects.
- recurrent headache which is usually severe, unilateral (hemicrania) and lasts for hours or days;
- photophobia;
- nausea or vomiting.

	TMJ pain dysfunction	Psychogenic	Idiopathic trigeminal neuralgia	Migraine	Migrainous neuralgia
Age (years)	20-30	35-60	50	Any	30-50
Sex	F>M	F>M	F>M	F>M	M>F
Site	Temple, ear, jaws, teeth. Usually unilateral	Diffuse, deep, sometimes across midline	Unilateral, mandible or maxilla	Any	Retro-orbital
Associated features	Click in TMJ, trismus	Life-events, back pain etc.		Photophobia, nausea, vomiting	Conjunctival injection, lacrimation, nasal congestion
Character	Dull, continuous	Dull, boring continuous: stress, fatigue	Lancinating	Throbbing	Boring
Duration of episode	Weeks to years	Weeks to years	Brief (seconds)	Hours (usually day)	Few hours (usually night)
Precipitating factors	Yawning, stress, parafunction	Depression	Trigger areas	Foods	Alcohol
Relieving factors	Antidepressants, other treatments	Antidepressants	Carbamazepine	Sumatriptine (see text)	Sumatriptine (see text)

**Table 13.** Differentiation of important types of facial pain.

*Management*

In acute attacks aspirin or paracetamol may give some relief and ergotamine or sumatriptine given early may abort an attack. However, these should be prescribed by a physician, because they can produce serious adverse reactions. There is no reliable evidence that occlusal problems underlie most migraine and thus splints etc. are rarely indicated.

Often patients prefer to lie in a quiet, dark room. Fortunately, the number, frequency and intensity of attacks usually diminish with increasing age and spontaneous remissions are not uncommon.

**Migrainous Neuralgia (Cluster Headache)**

Migrainous neuralgia is a rare type of retro-orbital pain occurring mainly at night, in young men.

*Aetiology*

Migrainous neuralgia is less common than migraine, and is related to vascular changes.

*Clinical Features*

The pain typically:

- is unilateral;
- occurs in attacks, which last less than 1 hour, commence and often terminate suddenly;
- is often precipitated by alcohol consumption;
- often awakens the patient at night or in the early hours of the morning (2-3 a.m.);
- is burning and ‘boring’ in character;
- is localized around the eye;
- is associated with profuse watering of the eye on the affected side, congestion of the conjunctiva, nasal discharge and obstruction.

*Management*

Migrainous neuralgia should be managed by a physician, with oxygen inhalations, non-steroidal anti-inflammatory agents, ergotamine or sumatriptine.

**Cranial Arteritis**

Cranial arteritis (temporal arteritis; giant cell arteritis) is a rare condition seen mainly in elderly people; the pain is associated with dilated, throbbing superficial temporal arteries.

*Aetiology*

Biopsy shows the arterial elastic tissues

to be fragmented, with giant cells numerous in the region of the deranged internal elastic lamina. It appears to be an immunological type of disease.

*Clinical Features*

Cranial arteritis is characterized by:

- deep and aching, throbbing and persistent pain, often over the temple;
- pain that is made worse when the patient lies flat (it may be exacerbated or reduced by pressure on the artery involved);
- tenderness of the affected superficial temporal and other cranial arteries;
- malaise, weakness, weight loss, anorexia, fever, sweating;
- a raised erythrocyte sedimentation rate (or plasma viscosity).

*Management*

Patients with cranial arteritis may be threatened with loss of vision, and therefore urgent treatment with systemic corticosteroids (prednisolone) is indicated.

**OTHER ORGANIC CAUSES**

These include:

- raised intracranial pressure;

- meningeal irritation;
- diseases of the skull;
- medical diseases;
- chronic post-traumatic headache.

**REFERRED CAUSES**

Pain may occasionally be referred to the face or jaws from the neck (see above), lungs or heart.

Anginal pain usually affects the mandible, is initiated by exercise (especially in the cold) and abates quickly on resting.

**FURTHER READING**

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**BOOK REVIEW**

**Oxford Handbook of Clinical Dentistry**, 3rd edn. By Mitchell. Oxford University Press, Oxford, 1999 (£17.95). ISBN 0-19-262963-8.

This is a difficult book to review, there is so much in it! The book was initially written to be a white coat pocket book providing easy reference not only for the dental student but also practitioners who wanted a quick reference guide. The fact

that it is now on its 3rd edition shows how popular it has been.

The book has been updated with some new chapters and contributions, particularly from Brian Nattress in the Restorative chapters, which have been revised for the better. New sections have been included on evidence-based practice, the new NHS complaints procedure, OSCEs and the 1997 ALS guidelines.

The text is set out in chapters according to specialty or topic of interest. Everything from local anaesthesia for

children to cardiovascular disease is covered. The authors intend that students will use the book as an aide memoire and in support of this there are spaces on pages on which additional notes can be made.

Dipping into the book for information is easy and useful and I think that this edition like the others will become very popular. I think its place as a white coat book is safe!

**Madeleine C. Murray**  
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**BELLE MAUDSLEY LECTURE**

**APPLICATIONS FOR THE BELLE MAUDSLEY LECTURER 2000**

This award of £500 is intended for those who have completed their specialty training in orthodontics within the past five years and are in hospital, university, community or specialist practice. Submissions should be of clinical interest within the field of orthodontics and should be in the form of a paper suitable for publication in *Dental Update*.

Prospective applicants are advised to consult past issues to discern the particular style and nature, especially for orthodontic articles, as published in *Dental Update*.

The successful applicant will be required to deliver the Belle Maudsley Lecture at the invitation of the British

Orthodontic Society at the 1999 British Orthodontic Conference in Brighton, and the paper will be submitted to *Dental Update*.\* Where a paper received from an unsuccessful applicant is considered to be of suitable merit, this will also be submitted to *Dental Update* for possible publication in a later edition of the journal.\*

Applications, which should conform to the Guidelines for Authors (*available from the publishers*), should be sent to: The Chairman, Scholarship & Awards Committee, British Orthodontic Society, Eastman Dental Hospital, Gray's Inn Road, London WC1X 8LD. The deadline for applications is 1 February 2000.

\*The acceptance for publication of any paper depends on independent referees' reports organized by *Dental Update*.