



Orofacial Dental Pain and Its Management – A General Guide and Systemic Review

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ABSTRACT: Pain is one of the main symptoms for which patients seek medical attention. Pain has been designated as the “Fifth vital sign” to mark its importance as health status indicator. Orofacial dental pain may be due to various conditions affecting numerous structures local to or distant to the oral cavity including the meninges, cornea, oral, nasal, sinus mucosa, dentition, musculature, salivary glands and temporomandibular joint. Evidence support the fact that the most commonly experienced orofacial pain is dental in nature. The dental reasons should be well thought of as the first step even in cases where orofacial pain is poorly localized. One of the most common reasons for seeking dental care is said to be pain and dysfunction, usually involving the teeth and surrounding tissue. Musculoskeletal, vascular and neuropathic causes of orofacial pain occur very frequently. Orofacial disorders may have pain and associated symptoms arising from a discrete cause, such as postoperative pain or pain associated with a malignancy, or may be syndromes in which pain constitutes the primary problem, such as TMJ disorder pain or headaches.

KEYWORDS: Dental pain, Musculoskeletal pain, Neuropathic pain, deep somatic pain.

INTRODUCTION

Orofacial pain may be acute or chronic. Risk factors for chronic orofacial pain include age, gender, and psychological factors. Most population-based studies have shown that women report more facial pain than men with rates approximately twice as high among women compared to men.¹

Evidence support the fact that the most commonly experienced orofacial pain is dental in nature. The dental reasons should be well thought of as the first step even in cases where orofacial pain is poorly localized. One of the most common reasons for seeking dental care is said to be pain and dysfunction, usually involving the teeth and surrounding tissue. Musculoskeletal, vascular and neuropathic causes of orofacial pain occur very frequently. Orofacial disorders may have pain and associated symptoms arising from a discrete cause, such as postoperative pain or pain associated with a malignancy, or may be syndromes in which pain constitutes the primary problem, such as TMJ disorder pain or headaches.²

The clinical examination of the orofacial pain patient includes assessment of cranial nerve function, cervical spine evaluation (posture and range of motion), palpation of masticatory and neck muscles, temporomandibular joint examination (tenderness to palpation, range of motion, joint sounds), and complete intra-oral and dental evaluation. Depending upon the findings of the history and clinical evaluation, appropriate laboratory tests and diagnostic imaging procedures may be required.³

CLASSIFICATION OF OROFACIAL PAIN

The first prerequisite in classifying pain is a common language with which to communicate intelligibly. A reliable pain classification needs to be based on symptomatology. This requires an understanding of the clinical characteristics displayed by the different categories of pain. It is on the basis of the subjective symptoms and objective signs of the nociceptive condition under examination that proper identification is made.

Classification of Headache by International Headache Society's (1988)

Part One: The primary headaches

- Migraine



- Tension-type headache
- Cluster headache and other trigeminal
- autonomic cephalalgias
- Other primary headaches

Part Two: The secondary headaches

- Headache attributed to head or neck trauma
- Headache attributed to cranial or cervical vascular disorder
- Headache attributed to nonvascular intracranial disorder
- Headache attributed to substances or their withdrawal
- Headache attributed to infection
- Headache attributed to disorder of homeostasis
- Headache or facial pain attributed to disorder of cranium, neck, eyes, ears, nose, sinuses, teeth, mouth, or other facial or cranial structures
- Headache attributed to psychiatric disorder

Part Three: Cranial neuralgias, central and primary facial pain and other headaches

- Cranial neuralgias and central causes of facial pain³
- Other headache, cranial neuralgia, central or primary facial pain

A. The **IASP classification** of chronic pain for ICD-11: chronic secondary headache or orofacial pain Rafael Benoliela , Peter Svenssonb , Stefan Eversc, Shuu-Jiun Wangd,e, Antonia Barkef , Beatrice Korwisif 2016

- Chronic primary headache or orofacial pain Chronic migraine without or with aura (G43.3)
- Chronic tension-type headache (G44.22)
- Chronic trigeminal autonomic cephalalgias (TACs):
- Chronic cluster headache (G44.02)
- Chronic paroxysmal hemicranias (G44.04)
- Short-lasting unilateral neuralgiform headache with conjunctival injection and tearing (SUNCT) (G44.05)
- Hemicrania continua (G44.51)
- Chronic primary temporomandibular disorder pains Myalgia (M79.1)
- Myofascial pain with referral Arthralgia (M26.62)
- Chronic burning mouth Glossodynia (K14.6)
- Chronic primary orofacial pain
- Orofacial pain as a presentation of primary headaches
- Persistent idiopathic dentoalveolar pain
- Atypical facial pain (persistent idiopathic facial pain) (G50.1)⁴

• Pain of Dental origin-

A) Dental Pain

Dental pain has their origin in the dental pulps or the periodontal structures.

➤ Pulpal Pain

a) Acute Pulpal Pain

The most typical of all the visceral pain is the acute pulpal pain. It is completely nonlocalizable by the patient, that its source often cannot be determined subjectively. Objectively can be determined in the form of deep caries, erosion into the pulp chamber or root canal or fracture or splinting. The cause of acute pulpal pain is noxious stimulation of the pulpal receptors. Normally the tooth structures protect these nerve endings from the superficial stimulation so that only extreme surface irritation such as electric stimulation or extremes of thermal changes is sensed, as pain ⁵



b) Chronic Pulpal Pain

Under certain conditions, injured pulpal tissue may progress from an acute to chronic inflammatory phase and thus undergo changes that proceed neither to resolution nor to necrosis but remain indefinitely as to what is described as chronic pulpitis. When chronic pulpitis develop, the pain response changes from extremely variable character of acute pulpal pain to milder or less variable discomfort that may not be described as pain at all, in fact the tooth may become symptomless unless further injury takes place.

B) Toothache from Non dental/Non Odontogenic cause

Sources of Non-Odontogenic dental pain

1. Dental pain of Myofascial Origin
2. Dental pain of Sinus/Nasal Mucosal Origin
3. Dental pain of Neurovascular Origin
4. Dental pain of Neuropathic Origin
 - a. Episodic Neuropathic
 - b. Continuous Neuropathic Toothache
 5. Dental pain of Cardiac Origin
 6. Dental pain of Psychogenic Origin
 7. Dental pain of Somatoform origin⁶

Characteristics of Myofascial Toothache

The pain is relatively constant, dull, and aching and nonpulsatile. The toothache is not provoked by local stimulation. The toothache is increased with muscle function. Other heterotopic pains are often reported (i.e. "tension type" headache). The presence of localized firm, hypersensitive bands within the muscle tissues (trigger points). Increased provocation of the trigger points increases the toothache (heterotopic pain).⁷

Characteristics of Sinus/Nasal Mucosal Dental pain-

Pressure felt below the eyes. The pain is increased by applying pressure over the involved sinus. The tooth is sensitive to percussion. The toothache is increased by lowering the head. The toothache is increased by stepping hard on the heel of the foot. Local anaesthesia of the tooth does not eliminate the pain. The diagnosis is confirmed by appropriate imaging.⁸

Characteristics of Neurovascular Dental Pain-

An intense, often pulsating toothache. The pain has a temporal, periodic behavior with complete remission between episodes. Frequently felt in a maxillary premolar or canine.

The toothache may be immediately preceded by focal neurologic symptoms (an aura). The toothache is accompanied by photophobia, phonophobia. Provocation of the tooth does not increase the pain. The effect of local anaesthesia is unpredictable. A history of other neurovascular disorders (migraine). A trial of 50 mg tablet of sumatriptan (Imitrex) reduces the toothache.⁹

Characteristics of Neuralgic Dental pain-

The pain is a severe, unilateral, lancinating, shock-like (paroxysmal pain) felt in a tooth. The pain episodes are brief, lasting only 5-10 seconds. There is no pain reported between episodes.

The pain is provoked by relatively innocuous peripheral stimulation of a "trigger zone". The trigger zone is commonly an extra-oral site such as the lip or chin but may be the tooth. If the tooth is the trigger zone, repeated stimulation will not produce the paroxysmal pain (need time for quenching period).

If the tooth is the trigger zone, repeated stimulation will not produce the paroxysmal pain (need time for quenching period). Very localized anaesthesia of the tooth (inter-ligamentous injection) will not reduce the pain unless it is also the trigger zone. Local anaesthetic at the trigger zone (or a nerve block) will eliminate the episodes of paroxysmal pain and toothache during the period of anaesthesia.¹⁰

Characteristics of Neuritic Toothache

Persistent, nonpulsatile, often burning pain felt in a tooth. The presence of other neurologic symptoms. (I.e. paresthesia, dysesthesia, anaesthesia) Other teeth may feel "dead" or "strange". The associated gingival tissue may be affected. The onset of the toothache followed an infection or trauma (i.e. sinusitis, surgery etc.).¹¹



Characteristics of Deafferentation Toothache

A continuous tooth ache that may vary in intensity but is always present.

Most common in the maxillary molars and premolars. The pain location may change over time but usually remains in the same nerve distribution. Most common in middle aged females with a history of trauma to the painful region.

Characteristics of Atypical Odontalgia

The pain is felt in a tooth or tooth site (the maxillary canine and premolar are most commonly involved). The pain is continuous or almost continuous.

The pain persists for more than 4 months. There is no sign of local cause or referred pain. Local anaesthetic blocking of the painful tooth provides equivocal results. The effect of local anaesthesia is unpredictable. The toothache is non-responsive to dental therapies.¹²

Characteristics of Cardiac Toothache

A deep, diffuse tooth ache that may sometimes pulsate. The toothache has a pressure, burning quality. The toothache has a temporal behavior that increases with physical exertion or exercise. The toothache is associated with chest pain, anterior neck pain and/or shoulder pain. Local provocation of the tooth does not alter the pain. The patient has a prior history of cardiovascular disease. The pain is decreased with sublingual nitroglycerin (already prescribed by the physician).¹³

Characteristics of Somatoform Toothache

There is no identifiable source of pain. There is a lack of response to reasonable dental treatment. The pain is reported in many teeth and/or other sites.

The pain jumps from tooth to tooth or to other locations. There is a general departure from normal or physiologic patterns of pain. There is an unusual and unexpected response to therapy. The toothache spontaneously changes in intensity and quality. The patient presents with usual behavior or expectations. The clinical characteristics do not fit any of the other pain condition.¹⁴

Periodontal Pain

Periodontal pain is deep somatic pain of musculoskeletal type. It is more localized than pulpal (visceral) pain. It is intimately related to biomechanical (masticatory) function. It responds to provocation proportionately and in graduated increments rather than as threshold response like pulpal pain. The receptors of periodontal pain are capable of localization of stimulus. Therefore, periodontal pains of all types rarely present any real diagnostic problem because the proper offending tooth is readily identified and this is true for both whether the pain is in the apical area (periapical pain) of the periodontal ligament or in the lateral region of the tooth. Such localization is identified by applying pressure laterally or axially. The cause of the periodontal pain may vary, it may occur as primary periodontal inflammatory condition due to local cause such as trauma or occlusal stress or contact with an adjacent embedded tooth.

Atypical facial pain and atypical Odontalgia -

Atypical odontalgia (AO) has been defined as “severe throbbing pain in the tooth without major pathology.”¹⁷ AO is a localized form of atypical facial pain. It is poorly understood phenomenon associated with persistent pain in apparently normal teeth and surrounding alveolar bone.

Etiology and Pathogenesis

The causes and pathophysiology of AFP and AO remain enigmas still several casual theories have been proposed, but little evidence has been found to support these theories. The etiologies most commonly described for AFP and AO are:

1. Psychological
2. Deafferentation
3. Vascular or neurovascular.

1) **Psychological disorders-** Usually depression is the most commonly mentioned one. Lesse (1956) described patients with AFP and AO and he concluded that the pain complaints were entirely psychogenic in origin or represented a gross overreaction to a very minor organic deficit. Melzack and Wall (1965) stated that the psychological factors are important in AFP, perhaps by opening or closing various “gates” either peripherally or centrally.



2. **Deafferentation-** Deafferentation research has demonstrated that, after injury, organization and activity of central and peripheral nerves can change. This can result in chronic pain and other related symptoms (paresthesia, dysesthesia) for example, neuroma secondary to nerve trauma is thought to result in such pain.

3) **Vascular or neurovascular-** Rees and Harris (1978) and Sicuteri et al. (1991) suggested a vascular or neurovascular etiology. The patient can localize the area, even the tooth assumed to be the cause of the pain. Maier and Hoffmeister (1989) stated that some aspects of AFP can be seen as a form of reflex sympathetic dystrophy. Both AFP and complex regional pain syndrome share common features, such as the disproportionate development after an initiating noxious event of relatively low intensity, the pain relief after sympatholytic intervention.¹⁵

Clinical Features

Pain, usually located in a tooth or a tooth site. The pain is frequently continuous and persistent, but fluctuating in intensity. It affects predominantly maxillary molars and premolars.

Diagnosis

There are no universally accepted guidelines for the diagnosis of AO while several authors have suggested their own theories. In opinion the diagnostic criteria best describing the disease are the ones proposed by Graff-Radford and Solberg in 1992. The criteria describe the pain which is the principle characteristic of the disease in terms of location, timing, and duration. Moreover, the criteria help with the differential diagnosis by indicating the absence of clinical signs of pathology, and local anaesthesia does not resolve the pain.¹⁶

Diagnostic criteria for Atypical Odontalgia

Pain in a tooth or a tooth site, Continuous or almost continuous pain, Pain persisting more than four months, No sign of local or referred pain, equivocal somatic nerve block.

Differential diagnosis

Trigeminal neuralgia, Pain due to infection or trauma⁴¹, Dental pain of pulpal origin, Myofascial pain dysfunction syndrome¹⁷

Treatment

Counselling of the patient-Patients should be counselled regarding the nature of the pain and reassured that they do not have an undetected life threatening disease and that they can be helped without invasive procedures.

Consultation with specialists- Consultation with other specialists such as otolaryngologists, neurologists, or psychiatrists may be helpful if the condition does not resolve. Tricyclic amines such as amitriptyline, nortriptyline, and doxepin, alone or in association with phenothiazines. Treatment starts with a low dose of 20-25 mg of amitriptyline that needs to be adjusted according to two factors: (a) pain control and (b) adverse reactions. The dose is titrated until acceptable pain level is achieved, usually reaching up to 75 mg per day. Undesirable side effects require that tricyclic amines be titrated to the lowest clinically effective dose and discontinued if pain symptoms subside.

Monoamine oxidase inhibitors have shown to be therapeutically successful in some specific cases. Topical desensitization with capsaicin, topical anaesthetics, or topical doxepin. Analgesics and non-steroidal anti-inflammatory drugs give temporary relief. Benzodiazepines (e.g. combination of Chlordiazepoxide and amitriptyline) are effective in selected subgroups of AFP, such as in patients with a burning mouth syndrome.¹⁸

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