

## Differential diagnosis of facial pain

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### Abstract

We will describe the differential diagnosis of primary and secondary facial pains and present illustrative case studies. The diagnosis of facial pain needs a multidisciplinary approach if the clinical presentation is not pathognomic. While patients with acute facial pain urgently need treatment, those with chronic facial pain need at priority a correct diagnosis.

**Key words :** Facial pain ; clinical features ; causes.

### Introduction

A variety of etiologies can cause facial pain. A precise diagnosis is therefore mandatory in order to select the most effective therapy. Eye, ENT and dental disorders are frequent causes of pain in the face, but, when their clinical expression is not obvious, they are also often erroneously implicated in primary head/facial pains. For instance, tension-type headache or migraine are misdiagnosed as refractive errors or heterophoria, or as chronic sinusitis or temporo-mandibular dysfunction. Trigeminal neuralgia or cluster headache may be mistaken as dental pathology.

We will review the classification of facial pains, some cardinal features of their differential diagnosis and the major treatment strategies of neurological facial pains, as each of the non-neurological pains usually has an etiological treatment pertaining to the various subspecialities. Case studies will illustrate some of the diagnostic and management problems encountered in clinical practice.

### Classification

Most of the non-neurological causes of facial pain are listed in chapter 11 of the International Headache Society (IHS) Classification (Cephalalgia, 1998) (Table 1). A more detailed and comprehensive account of these causes can be found in the Classification of the International Association for the Study of Pain (IASP), as illustrated in table 2 for lesions of the oral cavity.

Neurological facial pains are mainly due to cranial neuralgias including trigeminal neuralgia and

Table 1

Non-neurological etiologies of facial pain

(IHS Classification)	
11.3	Eye disorders
11.3.1	acute glaucoma
11.3.2	refractive errors
11.3.3	heterophoria or heterotropia
11.4	Ears
11.5	Nose and sinuses
11.5.1	acute sinus headache
11.5.2	other diseases of nose or sinuses
11.6	Teeth, jaws and related structures
11.7	Temporomandibular joint disease

Table 2

Lesions of the ear, nose and oral cavity

	IASP	IHS
1. Maxillary sinusitis	031.X2a	11.5.1
2. Odontalgia ; Toothache 1. Due to dentinoenamel defects	034.X2b	11.6 id.
3. Odontalgia : Toothache 2. Pulpitis	031.X2c	
4. Odontalgia ; Toothache 3. Periapical periodontitis and abscess	031.X2d	
5. Odontalgia : 4. Tooth pain not associated with lesions (atypical odontalgia)	034.X8b	
6. Glossodynia and sore mouth (also known as burning tongue or oral dysesthesia)	051.X5 051.X8	
7. Cracked-tooth syndrome	034.X1	
8. Dry socket	031.X1	
9. Gingival disease, inflammatory	034.X2	
10. Toothache, cause unknown	034.X8f	
11. Disease of the jaw, inflammatory conditions	033.X2	
12. Other and unspecified pain in jaws	03X.X8d	
13. Frostbite of face	022.X1	

the recently coined "trigeminal dysesthesias" (Graff-Radford, 2000). The latter are post-lesional neuropathic pains (trauma, Herpes Zoster..) characterized by their continuous character and their association with hyperalgesia and allodynia (Table 3). "Atypical facial pain" (IHS code 12.8) is rarely a satisfactory diagnosis as it merely reflects the absence of an identified etiology (see case study 1).

Table 3

Neurological etiologies of facial pain

(IHS Classification)	
3	Cluster syndrome
3.1	cluster headache
3.2	chronic paroxysmal hemicrania
3.3	SUNCT
12	Cranial neuralgias
12.1	Persistent (“trigeminal dysesthesia”)
12.2	Trigeminal neuralgia
12.3	Glossopharyngeal neuralgia
12.4	Nervus intermedius neuralgia
...	
12.7	Central causes of facial pain
12.8	Facial pain not fulfilling criteria in groups 11 or 12 (“atypical facial pain”)

## Case study 1

- 53 y.o. male has since 6 months right facial pain
- pain is constant, described as severe aching, resistant to analgesics or NSAIDs
- it is centered on the right upper & lower teeth and irradiates towards the r. ear & nostrum
- the patient is a heavy smoker
- diagnosis on referral : “atypical facial pain”
- clin. exam. : some digital clubbing ; weight loss
- thoracic CT : bronchial carcinoma with mediastinal adenopathies
- Rp. : radiotherapy — disappearance of pain after 2-3 days
- diagnosis : referred pain from r. vagal nerve compression by metastatic adenopathies

Pain referred to the face, especially the ear, can be due to vagal nerve compression by tracheo-bronchial adenopathies in lung cancer. It is often misdiagnosed for several months before the cancer is detected (Schoenen *et al.* 1992).

Table 4

Pain of psychological origin in the head, face, and neck

	IASP	IHS
1. Delusional or hallucinatory pain	01X.X9e	4thdc 5&6
2. Hysterical, conversion, or hypochondriacal pain	01X.X9f (head or face)	
3. Associated with depression	11X.X9f (neck) 01X.X9g (head or face) 11X.X9g (neck)	

## Case study 2

- 68 y.o. male has since 1 week pain in the left inferior mandible
- light permanent pain with excruciating, unbearable, brief paroxysms irradiating to ipsilateral temple and neck
- the paroxysms are only alleviated by putting lukewarm water in his mouth
- no associated symptoms
- during the last 2 years, he has had similar pains twice for a few days
- has seen a dentist : “no problem”
- diagnosis on referral : “trigeminal neuralgia”,
- mandibular X-Rays : ? slight bone erosion ant.root left inf. premolar I
- referral to dentist : osteitis, cured after Rp.
- diagnosis : infection of dental root & osteitis

The “electric shock-like” character of trigeminal neuralgia pain is missing as well as “trigger zones”. Drinking is not a classical manoeuvre to alleviate pain in trigeminal neuralgia, where it can merely trigger pain. A second exam is sometimes useful.

The trigeminal autonomic cephalalgias (Goadsby and Lipton, 1997) which include cluster headache, chronic paroxysmal hemicrania, SUNCT and hemicrania continua, are responsible for pain in the upper part of the face, centered on the eye, but the most frequent causes of upper facial pains are tension-type headache and migraine, though in the latter pain in then face without pain in the head is exceptional.

Psychological factors appear to play an important role in certain facial pains, especially those classified as “atypical facial pain”. The IASP classification contains three categories of psychological pains whereas in the IHS classification such factors are listed as “most likely causative factors” (4th digit code) in some headache types (Table 4). The revised 2nd edition of the IHS Classification is planned to contains separate section for head/face pain attributed to psychiatric disorders.

In the population-based Danish study, etiologies of facial pains had the following lifetime prevalence in decreasing order : hangover (?! 72%), tension-type headache (69%) and migraine (15%), nose/sinus disease (15%), eye disorder (3%), neuralgias (0,5%) and ear disease (0,5%).

## Differential diagnosis

As in all pain syndromes, a detailed history is the essential part of the diagnosis. Together with the clinical examination, this allows to diagnose a primary headache or facial pain in most cases. If by history a primary pain disorder is suspected, but atypical features are present, and in particular if a secondary headache or facial pain is suspected, paraclinical investigations are necessary.

Diagnostic hints of facial pains can be gathered from the localisation of the pain, its character, temporal profile, associated symptoms and precipitating/aggravating factors. In rare primary disorders treatment response may help to establish the diagnosis. Because of the referral of pain to areas remote of those where the pain is generated, localisation is seldom pathognomic. Nonetheless, pain above the orbit or in the temple is typical of migraine or temporal arteritis, whereas orbital pain suggests cluster headache, glaucoma or the Tolosa-Hunt syndrome. Pain in the cheek can be found with acute maxillary sinusitis or dental problems, but also with trigeminal neuralgia or dysesthesias, the second division of the trigeminal nerve being

Table 5  
Diagnostic hints of facial pains

Character	Temporal profile
<ul style="list-style-type: none"> <li>- <i>mild &amp; dull</i></li> <li>tension-type</li> <li>temporomandibular dysfunction</li> <li>eye - refractive errors, heterophoria...</li> <li>- <i>severe, excruciating &amp; unbearable</i></li> <li>cluster syndrome</li> <li>glaucoma</li> <li>dental infection...</li> <li>- <i>explosive &amp; "electric shock"-like</i></li> <li>neuralgias</li> <li>- <i>burning, dysesthesias &amp; allodynia</i></li> <li>neuropathic orofacial pain</li> <li>("trigeminal dysesthesias")</li> </ul>	<ul style="list-style-type: none"> <li>- <i>very brief – seconds or &lt; sec</i></li> <li>neuralgias</li> <li>idiopathic stabbing headache</li> <li>- <i>brief – minutes</i></li> <li>SUNCT &lt; CPH &lt; cluster (seasonal !)</li> <li>dental infection...</li> <li>- <i>shortlasting – hours</i></li> <li>migraine</li> <li>glaucoma</li> <li>dental infection...</li> <li>- <i>longlasting – days</i></li> <li>migraine</li> <li>ENT, eye disorders</li> <li>- <i>continuous – weeks +</i></li> <li>trigeminal dysesthesias</li> <li>tension-type, temporomandibular dysf...</li> </ul>

#### Case study 3

- 55 y.o. female has since 9 years pain in the right inferior mandible
- started with quasi continuous pain for 2 months ("like a dental problem") thereafter typical explosive, brief, severe pain triggered by mastication, speech and touching the nose
- diagnosis : "trigeminal neuralgia"-satisfactory response to carbamazepine for 8 years, then increasing side effects
- in 1999 is referred to a dentist who diagnoses temporomandibular dysfunction and prescribes an occlusional splint
- as soon as the splint is applied, the patient becomes asymptomatic and stops CBZ. When the splint is taken out, the pain reappears.
- diagnosis : V3 neuralgia (?) favoured by temporomandibular dysfunction

In the majority of cases trigeminal neuralgia seems to be due to compression of the nerve by a vessel next to its entry in the brain stem. Amelioration of typical trigeminal neuralgia by an occlusional splint as in this patient is exceptional, but may be worthwhile trying with signs of TMJ dysfunction and trigeminal neuralgia.

#### Case study 4

- 57 y.o. male has since 10 years attacks of right supraorbital pain
- pain is of moderate intensity, lasts +/- 2 hrs and occurs 2-3 times/week
- it is associated with ipsilateral conjunctival injection, tearing and stuffy nose
- attacks can be precipitated by alcohol
- diagnosis on referral : "trigeminal neuralgia",
- CT scan : pituitary adenoma
- blood chemistry : increased prolactin
- disappearance of attacks shortly after starting treatment with bromocriptine
- diagnosis : macroprolactinoma

Symptomatic cases of cluster or chronic paroxysmal hemicrania are well documented in the literature. The structural lesions are usually, though not always, located in the midline next to the cavernous sinus loggia.

the most frequently affected. Pain in the mandible may indicate underlying pathology with eventual submental nerve compression, Eagle's syndrome or temporomandibular dysfunction. The tongue may hurt in the neck-tongue syndrome, where turning the head produces pain and paresthesias because of upper cervical spine pathology and anastomosis between the cervical plexus and the hypoglossus nerve.

The character and temporal profile of the pain are important clinical features (Table 5). The paroxysmal "electric shock"-like pain is for instance pathognomic of the neuralgias, in particular trigeminal neuralgia. By contrast, in the trigeminal dysesthesias occurring after a structural lesion of the trigeminal nerve the pain is described as continuous, burning numbness and often pulling pain. TMJ dysfunction usually produces pain that is sim-

ilar to tension-type headache, but in rare cases it could play an aggravating role in trigeminal neuralgia (see case study 3).

Associated symptoms may be characteristic of certain types of facial pain (Table 6). Ipsilateral autonomic signs centered on the eye including incomplete Horner's syndrome, conjunctival injection, tearing, eyelid edema and rhinorrhea are the hallmarks of the trigeminal autonomic cephalalgias Cluster, chronic paroxysmal hemicrania and SUNCT (Goadsby and Lipton, 1997 ; Dodick *et al.*, 2000).

Patients also have to be questioned about possible aggravating or ameliorating factors.

### Conclusion

Facial pain may have a variety of etiologies. A local cause (eye, ENT or dental) has to be excluded, as it often allows an etiological treatment. The most frequent primary facial pains are cluster headache and trigeminal neuralgia, which are typi-

Table 6  
Diagnostic hints of facial pains

Associated symptoms	Precipitating & aggravating factors
<ul style="list-style-type: none"> <li>- ciliary injection + blurred vision with "halos"</li> <li>acute angle closure glaucoma</li> <li>- + tearing, ptosis, nasal obstruction</li> <li>cluster, CPH, SUNCT</li> <li>- sensory deficit VI territory</li> <li>"Raeder's syndrome"</li> <li>(paratrig. struct.lesion)</li> <li>- explosive grimacing</li> <li>trigeminal neuralgia...</li> <li>- TMJ noise &amp; asymmetry</li> <li>temporomandibular dysfunction...</li> <li>- nasal discharge</li> <li>sinusitis...</li> <li>- GI symptoms &amp; sensoriphobia</li> <li>migraine...</li> <li>- systemic symptoms</li> <li>infection, inflammation, neoplasm...</li> </ul>	<ul style="list-style-type: none"> <li>- alcohol</li> <li>cluster</li> <li>migraine...</li> <li>- trivial touch / facial movements</li> <li>trigeminal neuralgia...</li> <li>- clenching &amp; chewing</li> <li>temporomandibular dysfunction</li> <li>dental pathology...</li> <li>- reading</li> <li>eye - refractive errors,</li> <li>heterophoria...</li> <li>- neck movements</li> <li>neck-tongue syndrome...</li> <li>- Valsalva manoeuvre</li> <li>acute sinusitis...</li> </ul>

Table 7  
Differential diagnosis of short lasting face and head pains

Characteristics	Cluster Headache	Chronic parosymal hemicrania (CPH)	SUNCT	Idiopathic stabbing headache	Trigeminal neuralgia
Prevalence	0.09 - 0.4%	rare	very rare	frequent	0.015%
Sex ratio (M:F)	9:1	1:3	8:1	M < F	2:3
Pain : type intensity localisation	transfixing unbearable orbital temporal	pulsating / transfixing unbearable orbital temporal	stabbing very intense orbital temporal	stabbling intense erratic	stabbing very intense V2 / V3
Attack duration	15-180 min	2-45 min	5-250 sec	< 1 sec	< 1 sec
Attack frequency	1-8 / day	1-40 / day	1 / day - 30 /day	variable	variable
Ipsilateral autonomic signs	+	+	++	-	-
Triggering by alcohol	+	(+)	-	-	-
Indomethacin efficacy	±	+	-	+	-

cal enough not to be confounded by a trained physician (Table 7). Their treatment is totally different. Other disabling secondary facial pains are trigeminal dysesthesias, most frequently caused by Herpes Zoster, facial or dental trauma. These neuropathic pains may respond favourably to the new generation antiepileptics lamotrigine and gabapentin.

To sum up, patients with acute facial pain urgently need treatment while patients with chronic facial pain urgently need a correct diagnosis ; for both a multidisciplinary approach may be rewarding.

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