



# **Management of Facial Pain**

**Essay**

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Master Degree in Otorhinolaryngology**

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## **LIST OF ABBREVIATIONS**

<b>5-HT receptor</b>	: Serotonin receptor
<b>CGH</b>	: Cervicogenic headache
<b>CH</b>	: Cluster headache
<b>CT</b>	: Computed tomography
<b>CPH</b>	: Contact point headache
<b>CTTH</b>	: Chronic tension type headache
<b>DHE</b>	: Dihydroergotamine
<b>ECG</b>	: Electrocardiography
<b>ESR</b>	: Erythrocyte sedimentation rate
<b>ETTH</b>	: Episodic tension type headache
<b>FDA</b>	: Food and Drug Administration
<b>GABA</b>	: Gamma aminobutyric acid
<b>GCA</b>	: Giant cell arteritis
<b>GPN</b>	: Glossopharyngeal neuralgia
<b>HZ</b>	: Herpes zoster
<b>IHS</b>	: International Headache Society
<b>IASP</b>	: International Association for Study of Pain
<b>MA</b>	: Migraine with aura
<b>MRA</b>	: Magnetic resonance angiography
<b>MRI</b>	: Magnetic resonance imaging:
<b>MS</b>	: Multiple sclerosis
<b>MVD</b>	: Microvascular decompression
<b>MWA</b>	: Migraine without aura
<b>NFP</b>	: Neuropathic facial pain
<b>NP</b>	: Neuropathic pain

<b>NSAIDs</b>	: Non steroidal anti-inflammatory drugs
<b>PET</b>	: Positron-emission tomography
<b>PHN</b>	: Postherpetic neuralgia
<b>PNS</b>	: Paranasal sinus
<b>REM</b>	: Rapid eye movement
<b>TCAs</b>	: Tricyclic antidepressants
<b>TMDs</b>	: Temporomandibular disorders
<b>TMJ</b>	: Temporomandibular joint
<b>TrPs</b>	: Trigger points
<b>TTH</b>	: Tension type headache
<b>TN</b>	: Trigeminal neuralgia
<b>V1</b>	: Ophthalmic division of trigeminal nerve
<b>V2</b>	: Maxillary division of trigeminal nerve
<b>V3</b>	: Mandibular division of trigeminal nerve
<b>VZV</b>	: Varicella zoster virus



## **Introduction**

Facial pain is a common complaint, affecting the lives of millions of people around the world. Generating a differential diagnosis requires thorough knowledge of the diagnostic range of facial pain (**Sarlani et al., 2005**).

The results of international epidemiologic studies indicate that facial pain occurs in approximately 10% of the adult population. Women are constantly more often affected than men by a ratio of 2:1 on the average (**Kohlmann, 2002**).

Innervation of facial region is provided mainly by the 5th (trigeminal nerve) cranial nerve and partly by the 9th (glossopharyngeal nerve) and 10th cranial nerves (vagus nerve), with a very minor contribution from the 7th cranial nerve (facial nerve). The back of the scalp is innervated primarily by dorsal roots of C1 and C2 spinal segments (**Tal et al., 2008**).

There is a vast array of facial pain categories including: (1) neuropathic, (2) neurovascular, (3) musculoskeletal, (4) pain caused by local, distant, systemic pathology or psychogenic causes (**Sarlani et al., 2005**).

In 1988, first edition the International Headache Society (IHS) Classification developed diagnostic criteria for headaches and divided these into headaches, cranial neuralgia and facial pain **(Farri et al., 2012)**.

The second edition of IHS Classification was published in 2004. Current classification comprises 14 groups. The first four cover “primary headaches”. Groups 5 to 12 of the classification refer to “secondary headaches”. Group 13, constitutes “cranial neuralgias and central causes of facial pain”. Group 14 consists of those headaches that are unspecified and not elsewhere classified **(Farri et al., 2012)**.

The International Association for Study of Pain (IASP) divides pain syndromes of head into (1) neuralgia of the head and face, (2) craniofacial pain of musculoskeletal origin, (3) lesions of the ear, nose and oral cavity, (4) primary headache syndromes, vascular disorders and cerebrospinal fluid syndromes, (5) pain of psychological origin **(Koopman et al., 2009)**.

Due to lack of objective diagnostic tools, diagnosis and classification of facial pain is made on clinical judgment using criteria of IHS or the criteria of IASP **(Koopman et al., 2009)**.

It is important for otolaryngologists to identify their critical role in diagnosing and treating the subset of patients that suffer from facial pain. It is equally important for the medical community to recognize the importance of a multidisciplinary team approach in the management of facial pain (**Numa et al., 2003**).

## **Aim of The Work**

The aim of this work is to review the literature discussing different causes of facial pain and their management.

## **Anatomical considerations related to facial pain**

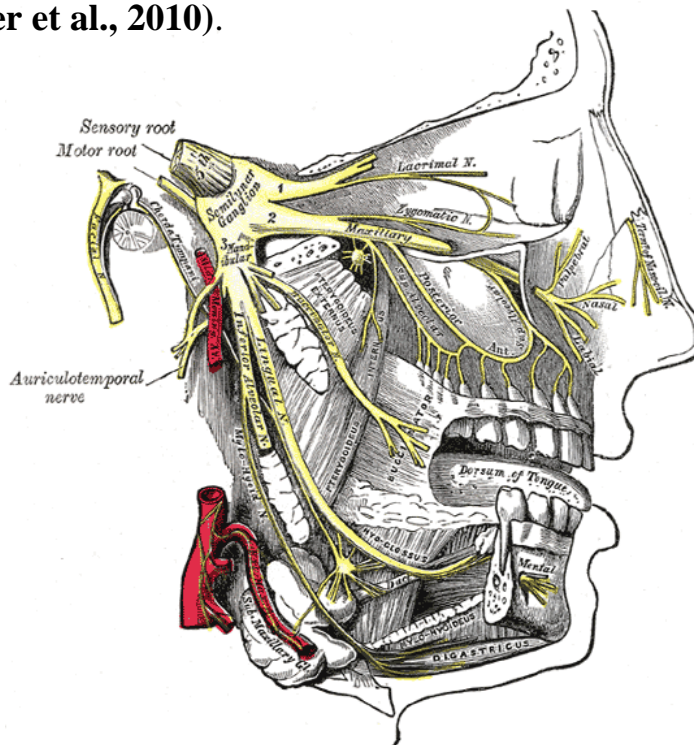
Somatic and visceral sensory innervation of the facial region is provided mainly by the 5th cranial nerve (trigeminal nerve) and partly by the 9th (glossopharyngeal nerve) and 10th cranial nerves (vagus nerve) with a very minor contribution from the 7th cranial nerve (facial nerve). The back of the scalp is innervated primarily by dorsal roots of C1 and C2 spinal segments (**Tal et al., 2008**).

Studies have confirmed that the trigeminal nerve; the largest cranial nerve has a predominant role in the pathophysiology of facial pain (**Larrier et al., 2003**).

The two roots of the nerve emerge from the ventro-lateral aspect of the pons near its upper border; the larger, lateral root (portio major) is sensory, the smaller, medial root (portio minor) is motor. The nerve passes ventrally through the cisterna pontis, and has a course of about 1 cm before the sensory root swells into the trigeminal ganglion (Gasserian ganglion), which is the first cell station for its sensory fibres (**Ellis et al., 2004**).

The trigeminal ganglion is located in a dural pocket (Meckel's cave) on the anterior slope of the petrous portion of the temporal bone (fig. 1). The trigeminal nerve coalesce from three major divisions: ophthalmic, maxillary, and mandibular nerves. The smaller trigeminal motor component accompanies the mandibular nerve (**Traurig et al., 2008**).

The trigeminal nerve receives somatic sensation from skin and mucus membrane of face, forehead, anterior scalp, nasal and oral cavities, conjunctiva, paranasal sinuses, teeth, anterior two thirds of tongue, and part of external surface of tympanic membrane as well as dura of anterior and middle cranial fossae (**Binder et al., 2010**).



**Fig.1:** Distribution of trigeminal nerve (**Binder et al, 2010**)

***Branches of the trigeminal nerve:***

(I) The *ophthalmic nerve (V1)* is the first branch of the trigeminal nerve. It provides sensory innervation to the cornea, ciliary body, iris, lacrimal gland, conjunctiva, part of the mucous membranes of the nasal cavity, and the skin of the eyelids, eyebrow, forehead, and nose. Anatomically, the ophthalmic nerve runs inferiorly to the oculomotor and trochlear nerves along the lateral wall of the cavernous sinus (**Larrier et al., 2003**).

The recurrent meningeal nerve is the first branch arising from the ophthalmic division and supplies sensory innervation to the dura matter. The ophthalmic division then divides into three branches whose names indicate their distribution: lacrimal, frontal and nasociliary nerves. They enter the orbit from the middle cranial fossa by passing through the superior orbital fissure (fig.2) (**Schulte et al., 2007**).