Management of Facial Pain

Essay
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Master Degree in Otorhinolaryngology

BY

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إدارة آلام الوجـــــــه

رسالة توطئة للحصول على درجة الماجستير فى

جراحة الأذن والأنف والحنجرة

مقدمة من

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

NSAIDs	: Non steroidal anti-inflammatory drugs
PET	: Positron-emission tomography
PHN	: Postherpetic neuralgia
PNS	: Paranasal sinus
REM	: Rapid eye movement
TCAs	: Tricyclic antidepressants
TMDs	: Temporomandibular disorders
TMJ	: Temporomandibular joint
TrPs	: Trigger points
TTH	: Tension type headache
TN	: Trigeminal neuralgia
V1	: Ophthalmic division of trigeminal nerve
V2	: Maxillary division of trigeminal nerve
V3	: Mandibular division of trigeminal nerve
VZV	: 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 (glossopharngeal 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 compromises 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 (glossopharngeal 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)**.

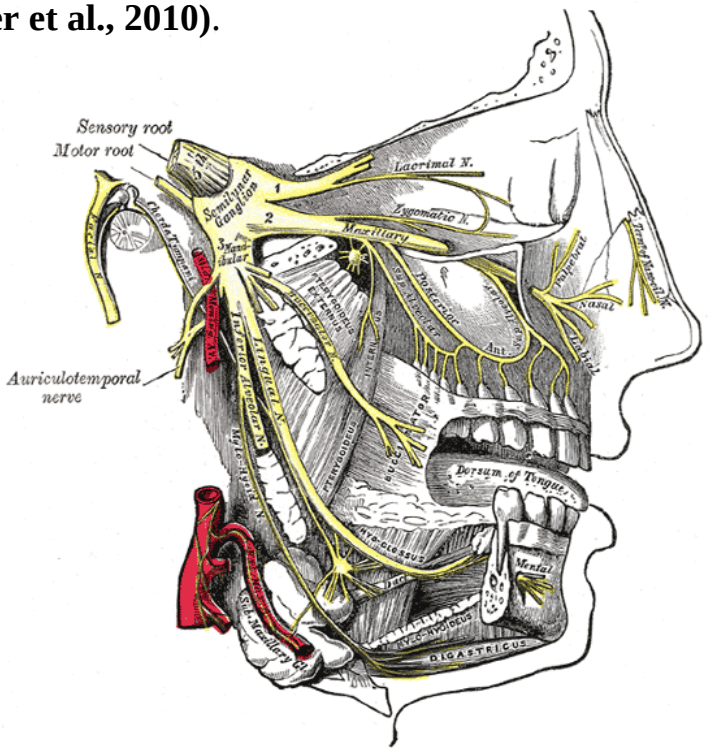

Fig.1: Distribution of trigeminal nerve **(Binder et al, 2010)**

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 occulomotor 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 supplys 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)**.