

Classification and Differential Diagnosis of Oral and Maxillofacial Pain



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KEYWORDS

- Orofacial pain • Maxillofacial pain • Craniofacial pain • Classification • Differential diagnosis
- Diagnostic evaluation • Physical examination • Diagnostic imaging

KEY POINTS

- Most orofacial pain is related to dental disease and the cause can be readily established, the problem dealt with expeditiously, and the pain eliminated.
- The formal medical evaluation includes the chief complaint, history of present illness, medical history, physical examination, diagnostic studies, including imaging, and psychosocial evaluation.
- The physical examination consists of a muscle examination, temporomandibular joint examination, intraoral examination, neurologic examination, and vascular examination.
- Diagnostic studies include blood tests, diagnostic injections, biopsies of suspicious lesions, radiographs, computed tomography, soft tissue MRI, technetium bone scan, salivary gland scintigraphy, and ultrasonography.

INTRODUCTION

Orofacial pain syndromes are common in clinical practice and tend to be unique in their presentation owing to the complex anatomy and specialized sensory innervation of the face, head, and neck. Although nociceptive transmission in the trigeminal and spinal systems is similar, the 2 systems have important differences. The 3 trigeminal cutaneous divisions are completely separate in a rostrocaudal pattern with topographical representation in the brainstem. They are also bilaterally distinct and separate. Additionally, however, there is a circumferential, cutaneous, perioral organization that is also topographically organized in the brainstem adjacent to the rostrocaudal organization in a complex somatotopic fashion.¹⁻³

In the perioral region, the trigeminal divisions contain afferent fibers that subserve the

dermatomes, which include the lips, teeth, gingiva, anterior two-thirds of the tongue, upper pharynx, uvula, and soft palate. In addition to this cutaneous distribution, the trigeminal nerve contains afferent fibers that provide sensory innervation to a variety of deep structures in the face, including the muscles of mastication and facial expression, the nasal and oral mucosa, the corneae, tongue, tooth pulp, temporomandibular joints, dura mater, intracranial vessels, external auditory meati, and ears (partially, and with cranial nerves [CN] VII, IX, and X).

The trigeminal system carries somatosensory information from these cutaneous and deep structures as well as from specialized organs that have principally nociceptive innervation. Most nociceptive afferent fibers relay through the trigeminal brainstem complex, with oral and perioral structures represented more rostrally than the peripheral sites on the face.¹⁻⁴

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In addition, nociceptive afferents from other CN and the upper cervical spinal segments (C2–C4) also are relayed through the trigeminal brainstem complex.^{5,6} In the subnucleus caudalis, cells relaying nociceptive signals (nociceptive-specific cells and wide dynamic range cells) are localized primarily to analogous regions of laminae I and V in the spinal cord.^{5,7} Deep afferent fibers also converge on cells that receive cutaneous nociceptive input, providing a substrate for referred pain in the face, head, and neck through the trigeminal system.^{5,6} This anatomic and physiologic construct has very important implications with regard to pain patterns in the face, head, and neck region and the source or generator of the pain disorder. Structures in the facial region and the cervical region can alternatively be involved in the production of pain in these respective areas and make the differential diagnosis confusing and sometimes elusive (Figs. 1 and 2).^{5,6,8} Finally, the trigeminal nociceptive relay cells are modulated strongly by central pathways (descending opioidergic, noradrenergic, and serotonergic) that may dynamically modulate nociception under a variety of environmental situations and behavioral states.^{1,4–6}

Although the trigeminal dermatomes do not overlap generally with those supplied by the adjacent cervical spinal nerves and other CN, they overlap extensively in the spinal afferent system. Because the peripheral sensory nerves overlap so little with the trigeminal system, nerve lesions may result in more pronounced central somatosensory changes

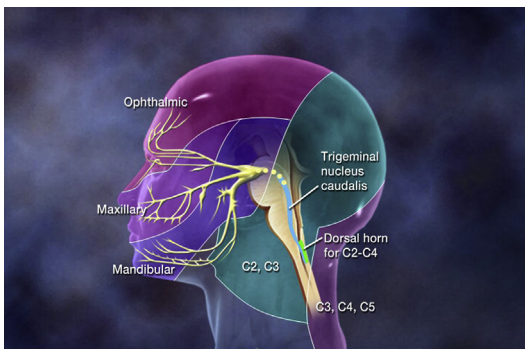


Fig. 1. Activation of the trigeminocervical network (TNC) may result in referred pain that could be perceived anywhere along the TNC. The TNC, which includes the 3 branches of the trigeminal nerve (the ophthalmic branch [V1], the maxillary branch [V2], and the mandibular branch [V3]) as well as the sensory nerves for the posterior head and neck (C2, C3, C4, C5) feed into the TNC. Activation of the TNC may result in referred pain to various locations along the TNC. Pain may be perceived on one or both sides of the head, the eyes or sinuses, and the posterior head and neck.

than those evoked by similar lesions in spinal nerves. These changes may partly underlie trigeminal neuropathic pain disorders and may also influence the development of chronic orofacial pain.⁹

As with other chronic pain conditions, psychosocial factors explain much of the variance in the outcome of persistent orofacial pain disorders (see article by Kulich RJ, et al: *A Model for Opioid Risk Stratification: Assessing the Psychosocial Components of Orofacial Pain*, in this issue). Affective and anxiety symptoms, especially emotional trauma, have been implicated in precipitating and maintaining chronic orofacial pain.¹⁰ Marked somatic overconcern or somatization disorder can also compromise treatment in these disorders. Similarly, chronic disability behavior further compromises the patient's status. Validated self-report orofacial pain scales also address psychosocial issues, and their use within multidisciplinary facial pain facilities is common.^{11–13}

DIAGNOSTIC EVALUATION

Pain in the orofacial region is a common presenting symptom in clinical practice. The majority of symptoms are related to dental disease and, in most cases, the cause can be established readily, the problem dealt with expeditiously, and the pain eliminated. However, in many patients, pain may persist and defy attempts at treatment. Intractable oral or facial pain can be challenging diagnostically, given the many potential causes of pain, the anatomic complexity of the region, and the psychosocial importance of the mouth and face. To formulate a differential diagnosis and ultimately make a definitive diagnosis to initiate proper

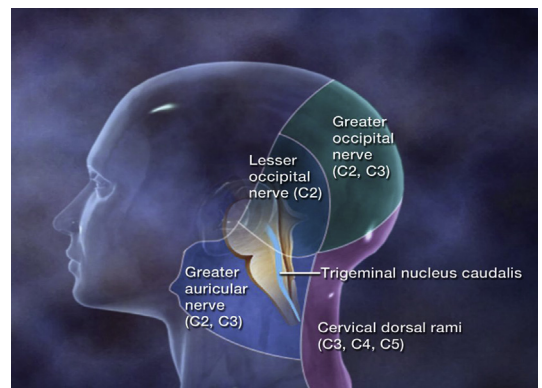


Fig. 2. Pain can be perceived in the posterior head and neck regions. Because activation of the trigeminocervical network can result in referred migraine pain to all regions supplied by the upper cervical nerves (C2, C3, C4, C5), patients may present with posterior head and neck pain.

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