

Imaging in Orofacial Pain

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KEYWORDS

- Imaging • Orofacial pain • Intraoral • Temporomandibular disorder • Neuropathic • Headache

KEY POINTS

- Imaging in orofacial pain involves using either a 2-dimensional and/or 3-dimensional modality. Each modality has its advantages and disadvantages.
- The diagnosis of orofacial pain challenges both dentists and physicians. For dentists, evaluation of orofacial pain must go beyond the oral cavity, teeth and their supporting structures, temporomandibular joints, and muscles of mastication. Physicians need to rule out common dental-related diseases.
- Imaging usefulness in the diagnosis of intraoral pain disorders, temporomandibular disorders, neuropathic pain disorders, and headaches is discussed.
- Inadequate radiographic evaluation before a dental surgical procedure is the most common cause of trigeminal nerve damage.
- Both dentists and physicians should be aware of pain associated with Eagle syndrome. It is important to remember that the location or site of orofacial pain is not always related to the source of the pain.

INTRODUCTION

The term orofacial pain refers to pain related to soft or hard tissues of the head and neck. It may present as either an acute or a chronic condition. Acute pain begins suddenly and usually does not last long, whereas chronic pain may last longer than weeks or months.¹ Chronic orofacial pain can have a negative effect on the patient's daily activities and quality of life, including sleep, absence from work, or loss of employment.² Studies have reported that the prevalence of orofacial pain may vary from 5% to 57% depending on many factors. These factors include the sociocultural differences of the study population, dental awareness of the patient, and the patient's access to dental care.^{3,4} The source and pathophysiology of orofacial pain include dental, mucosal, musculoskeletal, neurovascular, and neuropathic.⁵ These structures in the head and neck region, along with their complex cranial nerve innervation, make a differential diagnosis of orofacial pain more challenging because of the wide range of diagnostic

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possibilities.¹ Oberoi and colleagues⁴ have found that several studies have a similar distribution of orofacial pain symptoms. They showed that toothache was the most common symptom followed by temporomandibular joint (TMJ) pain. Another study used a systematic random sampling of 1668 patients visiting 100 general dentists and concluded that dentoalveolar and musculoligamentous pain were the most prevalent types of pain.³

The diagnosis of orofacial pain challenges both dentists and physicians. For dentists, evaluation of orofacial pain must go beyond the oral cavity, teeth and their supporting structures, TMJs, and muscles of mastication.⁶ Physicians need to rule out common dental-related diseases. A cross-sectional study conducted in 2016 included 166 general dentists.⁷ This study found that dentists had a less than desirable knowledge of the cause of chronic orofacial pain (48.2%), and its clinical presentation (45.2%). Furthermore, only 36.1% had good knowledge of what a physical examination for orofacial pain could include and only 7.8% had good knowledge of how it can be treated. The investigators recommended that educational programs in academic curricula be included to improve general dentists' knowledge of chronic orofacial pain. The diagnosis of orofacial pain bridges an important gap between dentistry and medicine. A multidisciplinary team approach has been recommended to recognize the clinical presentation of orofacial pain, improve treatment outcomes, and prevent the negative impact on the patient's quality of life.²

Imaging in orofacial pain involves using either a 2-dimensional and/or a 3-dimensional modality. The selection criteria of imaging modality should be based on the patient's chief complaint and individual needs, and the results of the clinical examination. The use of imaging is to determine the presence and/or absence of disease, to assess the extent and nature of disease, to evaluate the location, and to establish a baseline on which to measure the results of treatment or other intervention. The ultimate goal is to maximize diagnostic efficiency while minimizing patient's radiation risk.

MOST COMMON IMAGING MODALITIES FOR OROFACIAL PAIN

1. Two-dimensional
 - a. Intraoral radiography
 - i. Periapical radiography
 - ii. Bitewing examination
 - iii. Occlusal radiography
 - b. Extraoral radiography
 - i. Panoramic radiography
2. Three-dimensional
 - a. Cone beam computed tomography (CBCT)
 - b. Multidetector computed tomography (MDCT)
 - c. Magnetic resonance imaging (MRI)

The advantages and disadvantages of most common imaging modalities are listed in [Table 1](#).

Intraoral Radiography

Intraoral radiography is the most frequently used modality for demonstrating the condition of teeth and their supporting structures. There are 3 categories of intraoral radiographs: periapical, bitewing, and occlusal projections.

- After the clinical examination, periapical radiographs should be made to demonstrate the entire tooth and the surrounding bone in the area of interest. Periapical

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