PAIN UPDATE

Nonodontogenic toothaches

Edward F. Wright, DDS, MS

CLINICAL PROBLEM

A 45-year-old woman was examined for symptoms of constant pain with an intensity of 6 (on a scale from 0 to 10, in which 0 indicated no pain and 10 indicated worst pain possible) that worsened when eating where teeth nos. 30 and 31 used to be located. The patient reported when she first went to her dentist complaining of this pain that it seemed to be in tooth no. 30. Her dentist could not identify any dental or periodontal pathology. As the patient insisted, her dentist performed "root canal treatment" on the tooth and this temporarily relieved her pain. The pain subsequently moved to tooth no. 31 and her dentist could not diagnose a dental-related problem, yet performed endodontic treatment on this tooth, which also provided her with temporary relief. Tooth no. 30 began to hurt again, and it was extracted. A short time later tooth no. 31 began to hurt, and it was also extracted. The patient still had this pain approximately 3 years after it initially began.

Intraoral examination, as well as panoramic and bitewing imaging, found that the extraction sites had healed well and no intraoral pathology could be identified. What could be the true source of this patient's pain?

EXPLANATION

In approximately 3.4% of the teeth that receive endodontic treatment, the pain is either initially caused by a nonodontogenic etiology, or the posttreatment pain is due to a nonodontogenic phenomenon.[1] It has been estimated that 680,000 teeth needlessly receive endodontic therapy each year.[2] This article focuses on a clinical approach to identifying the etiology of most nonodontogenic toothaches.

When a patient complains of pain in a tooth, clinical experience has shown that the pathology causing it is most often at or near the location the patient perceives it. Due to the convergence of peripheral nerves in the dental arches, it may be difficult to decide between 2 or 3 neighboring teeth. It is recommended that clinicians first try to identify the cause for the pain at this location, for example, caries, periodontal disease, a pulpal disorder, local hyperocclusion, or an incomplete tooth fracture.[3-5] Also, the clinician should be aware that the pain could be due to persistent oral habits such as clenching or grinding of teeth during the daytime or during sleep. In this situation, multiple teeth in the arch are generally tender to percussion and often the opposing teeth are also tender.[6]

If the reason for the pain cannot be identified at the exact location the patient perceives it, investigate whether its etiology is in the region. The pain may be from a different tooth, which could even be in the opposing arch. In this search, local anesthesia may need to be used to anesthetize teeth with a ligamentary injection, or anesthetize sections of the mouth with local anesthetic infiltrations or blocks.[3,4]

Sinusitis should also be considered when evaluating the region.[3,7] If the tooth pain is in the maxillary arch and began recently, ask whether the patient recently had a cold or allergy flare-up, suggesting a possible correlation. If the tooth pain is a chronic problem, ask whether sinus congestion flare-ups correspond with the tooth pain complaint. To test whether sinus congestion is contributing to the pain complaint, medications such as 1 60-milligram tablet of pseudoephrine hydrochloride (Sudafed) every 4 to 6 hours and/or 2 sprays of 5% oxymetazoline hydrochloride (Afrin) in each nostril every 12 hours, may be recommended or prescribed. If sinus congestion is contributing to the dental pain complaint, the pain should decrease as medications temporarily reduce the congestion.[7,8]

In the event that local and regional etiologies have been ruled out, consider that the pain may be referred from a musculoskeletal structure. The most common cause for nonodontogenic toothaches is thought to be referred pain from muscles, even if the patient does not perceive pain in the muscle.[5,8-10] It has been reported that tender areas within the ipsilateral masseter muscle are probably the most common structures to refer pain to the posterior teeth.[10-12] One study found that the tender areas within the masseter muscle, which generally refers pain to maxillary teeth, are most commonly in the superior region of the masseter muscle, whereas those that refer to mandibular teeth are most commonly in the inferior region of the masseter muscle.[12]

In an attempt to reproduce the referred pain to the tooth, identify locations where the masseter muscle is tender and then apply 1 kilogram (2.2 pounds) of force

TABLE

Recommended order in which to evaluate tooth pain.

POTENTIAL ETIOLOGY	WHAT IS TO BE EVALUATED
Local	Tooth for caries, periodontal disease, and so forth Tooth for heavy parafunctional forces
Regional	Other teeth Sinuses
Referred Pain	Masticatory and cervical muscles, and temporomandibular joints
Other Causes	Neurologic, neurovascular, cardiac, psychogenic, neoplastic, and other pathologic conditions

with your fingertip to each tender area for 5 seconds or until the tooth pain is elicited.[13] Each tender area may refer pain to a different location; hence, this palpation may need to be repeated until the tender area is identified that reproduces the patient's pain complaint. If these palpations do not reproduce the tooth pain, you can similarly palpate and attempt to reproduce the pain from other masticatory and cervical muscles, and the temporomandibular joints (TMJs) also can be palpated for the same purpose.[8,12]

Clinical experience has found that if palpation of masticatory musculoskeletal structures reproduces the pain complaint and local and regional etiologies for the pain have been ruled out, then it is highly probable that treating these structures will decrease the pain complaint. This is accomplished through traditional temporomandibular disorder (TMD) therapies.

In the event that local, regional, and referred pain etiologies have been ruled out as the cause for the tooth pain, the dentist must be cognizant that nonodontogenic toothaches can be caused by a neurologic, neuropathic, neurovascular, cardiac, psychogenic, neoplastic, or other pathologic condition.[3,9,11] The most common of these is the neuropathic condition known as atypical odontalgia[14-16] or more recently renamed "persistent dentoalveolar pain" disorder on the basis of the presence of chronic, continuous pain localized in the dentoalveolar region and not caused by another disorder.[17] A summary of these recommendations is provided in the table.

If the dentist cannot ascertain the cause for the nonodontogenic toothache, it is recommended the patient be referred to someone with specialized training in orofacial pain or to a neurologist who could at least evaluate the patient for potential neurologic, neuropathic, and neurovascular causes. If a malignant condition is causing the problem, that would be discovered during the neurologic or other medical workup.

EVALUATION, DIAGNOSIS, AND MANAGEMENT

Palpating the patient's masticatory and cervical structures revealed that she had generalized tenderness of her masticatory muscles and of both TMJs. Knowing that referred pain to mandibular teeth is most commonly reproduced by palpating tender areas within the inferior region of the masseter muscle, her right masseter muscle was palpated as described above. The first area tested reproduced the patient's pain complaint, and the diagnosis for this pain complaint was myofascial pain with referral.[13]

Because local (for example, extraction sites) and regional (for example, adjacent teeth, opposing teeth, and sinus) etiologies for the tooth pain had been ruled out, the decision was made to provide conservative TMD therapies that could reduce the impact of the tender area within the patient's masseter muscle.

The patient was given TMD self-management instructions.[8] When discussing the potential negative impact of daytime parafunctional habits, it was learned that she always clenched her teeth whenever she was stressed, deep in thought, driving, or working on the computer. The patient reported that she thought she could break this habit on her own now that she was made aware of it. Impressions and an interocclusal record were made for a stabilization appliance, and the appliance was inserted at the next appointment.

At the 5-week appliance follow-up appointment, the patient related she no longer was clenching her teeth during the day; she wore her stabilization appliance at night, and the tooth pain was no longer present. Further resources for understanding the practical implications of nonodontogenic toothaches are provided in the box. ■

BOX

Further resources for practical implications.

- Wright EF. *Manual of Temporomandibular Disorders.* 3rd ed. Ames, IA: Wiley Blackwell; 2014.
- American Academy of Orofacial Pain. Toothaches of non-dental origin. Available at: http://www.aaop.org/content.aspx?page_id=22&club_id=508439&module_id=108085.
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- Okeson JP. *Bell's Oral and Facial Pain.* 7th ed. Chicago, IL: Quintessence; 2014

http://dx.doi.org/10.1016/j.adaj.2014.07.001

Dr. Wright is a professor, Department of Comprehensive Dentistry, Dental School, University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Dr., MSC 7890, San Antonio, TX 78229, e-mail wrighte2@uthscsa.edu. Address correspondence to Dr. Wright.

Disclosure. Dr. Wright did not report any disclosures.

Pain Update is published in collaboration with the Neuroscience Group of the International Association for Dental Research.

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