

# Dental Pulpalgia Contributing to Bilateral Preauricular Pain and Tinnitus

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*The case of a patient with bilateral preauricular pain and tinnitus is reported. Minimal relief was obtained with traditional temporomandibular disorders therapy, and complete relief was obtained after endodontic therapy. Pulpal conditions that can refer pain are discussed, and recommendations are made to help practitioners identify a possible pulpal etiology for symptoms and tests of temporomandibular disorders.*

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Preauricular pain is a common symptom for patients with temporomandibular disorders (TMD), and 25% to 53% of patients with TMD report tinnitus.<sup>1-4</sup> Pulpalgia has been reported to cause referred pain in the masticatory muscles,<sup>5,6</sup> but no report of it causing referred bilateral pain or tinnitus is known. The present report describes a patient whose bilateral preauricular pain and tinnitus could be intensified by a thermal stimulus and relieved with a ligamentary injection. Minimal relief was obtained with traditional TMD therapy, and complete relief was obtained after endodontic therapy. Pulpal conditions that can refer pain are discussed, and recommendations are made to help practitioners identify a possible pulpal etiology for TMD symptoms; tests to confirm or refute this suspicion are discussed.

## Case Report

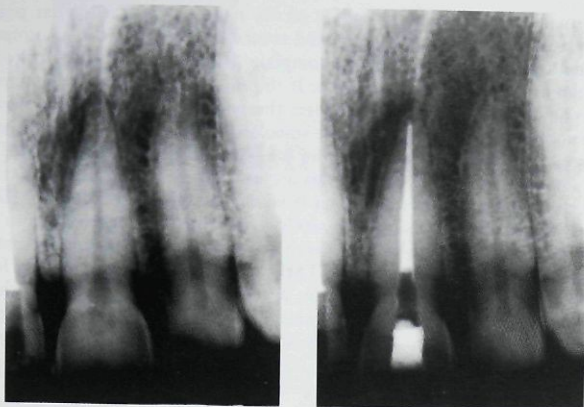
A patient with bilateral preauricular pain and tinnitus was diagnosed as having TMD and was referred for TMD therapy. The bilateral preauricular pain was constant dull pain with morning and evening throbbing pain, and the bilateral tinnitus was constant.

Palpation of the masticatory muscles revealed generalized tenderness. The patient reported that palpation of his masseter muscles increased the dull pain but did not change the throbbing pain or tinnitus. The throbbing pain could be initiated and the dull pain and tinnitus could be intensified by applying pressure to the apical area of his maxillary left central incisor or by applying cold to this tooth. The pain from the cold lingered for only 15 seconds. These symptoms were temporarily eliminated by a ligamentary injection along the tooth. The anterior teeth all responded similarly to electric pulp testing, except for the endodontically treated maxillary right central incisor, which had been treated 15 years prior because

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Fig 1 (Left) Radiograph of maxillary left central incisor prior to endodontic therapy.

Fig 2 (Right) Radiograph of maxillary left central incisor immediately after endodontic therapy.



of trauma. A periapical radiograph of the maxillary left central incisor did not reveal any evidence of apical pathosis (Fig 1).

After consultation with a staff endodontist, it was decided that since there was no apparent etiology for pulpalgia other than trauma 15 years earlier, TMD therapy was to be initiated first. If satisfactory symptom relief was not obtained, endodontic therapy was to be considered.

The patient was given standard TMD self-care instructions, ie, apply heat to the bilateral preauricular areas, avoid hard or chewy foods, and restrain from activities that overuse the muscles of mastication (oral habits). A mandibular acrylic resin flat plane splint was fabricated, and the patient wore it 24 hours per day, except when eating.

The patient had minimal improvement during the first week of TMD therapy; there was no change in his throbbing pain or tinnitus, but the intensity of the dull pain dropped from a rating of 6 (of a possible 10) to 5. No further improvement was observed during the next 3 weeks. The patient's symptoms were still intensified with cold or pressure to his central incisor, so endodontic therapy was provided (Fig 2).

One week after endodontic therapy, the patient had significant improvement. The throbbing pain was gone, the dull pain dropped from 5 to between 3 and 4, and the tinnitus changed from constant to occurring only two to three times during the week. Apical pressure to his central incisor increased his dull pain. The patient continued to wear his splint 24 hours per day, except when eating. At 3 weeks postendodontic therapy, the patient said he was symptom free, and the symp-

toms could not be stimulated at the tooth level. The patient was instructed to slowly discontinue wearing of the splint.

Two months postendodontic therapy, the patient said that as long as he wore the splint at night, he was symptom free; otherwise, he had mild dull preauricular pain and occasional tinnitus. Palpation of the muscles of mastication and temporomandibular joints (TMJs) revealed slight tenderness. Tinnitus could be stimulated by palpating either TMJ or masseter muscle.

## Discussion

Referred pain may be a patient's primary complaint and can appear as a TMD symptom. The tooth symptoms may be only mild in comparison. A pulp exhibiting symptoms of acute pulpalgia may refer pain to other teeth or to nearby cutaneous and deep structures.<sup>5</sup> A tooth with an acute pulpalgia generally presents with a history of spontaneous discomfort that may be altered by external stimulation, causing either an exacerbation or a reduction in the intensity of the discomfort. There is no radiographic evidence of apical pathosis, but apical inflammation may be present. Acute pulpalgia is also used to describe pulpal pathosis in which there is no history of spontaneous pain, but there is an extreme reaction to external stimulation with lingering sensitivity after the stimulus is removed.

A suspected tooth can be evaluated to determine if its pulp is causing or contributing to the patient's TMD complaint by placing an external

stimulus (hot or cold, depending on the patient's chief complaint) on the suspected tooth. If this aggravates the patient's TMD complaint, a ligamentary injection may be given. If the injection dramatically reduces or eliminates the patient's pain, this suggests the pulp of the stimulated tooth is causing or contributing to the patient's pain complaint. Only after both criteria are met should a determination of referred pain from the dental pulp be made. If the suspected tooth is diagnosed as exhibiting an acute pulpalgia with referred pain causing or contributing to the TMD symptoms, endodontic therapy or extraction is required to resolve the referral of these symptoms.

The ligamentary injection rather than the traditional dental anesthetic injection is recommended for the anesthetic test because a maxillary infiltration or inferior alveolar nerve block may cause symptom reduction merely as a result of its effect on the lateral pterygoid or medial pterygoid muscle, while the ligamentary injection should cause minimal change.

It is important that practitioners not rely on only the ligamentary injection test, because the anesthesia may block other sources of pain that may be the etiology of the referred pain, ie, pain from periodontal ligament inflammation or pulpal pain from adjacent teeth. Ligamentary injections have been shown to result in intraosseous distribution of the anesthetic, which may achieve pulpal anesthesia of as many as two adjacent teeth on each side of the injected tooth.<sup>7,8</sup> Therefore, pain reduction from the ligamentary injection should not by itself be considered diagnostic for the injected tooth. Instead, it should be used as an adjunctive measure to gain additional information to support the suspected diagnosis.

To help practitioners identify referred pain resulting from pulpal pathosis, the authors recom-

mend that practitioners evaluating patients for TMD or orofacial pain ask: (1) if hot or cold liquids aggravate their pain complaint and (2) if they have a dental problem. If the patient responds positively, the response should be evaluated further. If the tooth is found to cause or contribute to the patient's TMD symptoms, the tooth should be treated, and the patient should be reevaluated for residual TMD symptoms after symptoms have resolved from the dental procedure. Practitioners evaluating patients for TMD or orofacial pain must be alert for teeth that may be causing or contributing to the patient's symptoms and evaluate them when appropriate.

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## Resumen

**Pulpalgia Dental que Contribuye al Dolor Preauricular Bilateral y al Tinnitus**

Se reporta el caso de un paciente con dolor preauricular bilateral y tinnitus. Se obtuvo un alivio mínimo con la terapia tradicional para los desórdenes temporomandibulares, pero se obtuvo alivio completo después de realizar tratamiento de endodoncia. Se discuten las condiciones pulpaes que pueden referir el dolor, y se hacen recomendaciones para ayudar a los practicantes a identificar una posible etiología pulpar relacionada a los síntomas de desórdenes temporomandibulares.

## Zusammenfassung

**Pulpaschmerz im Zusammenhang mit beidseitigem präaurikulärem Schmerz und Tinnitus**

Es wird vom Fall eines Patienten mit beidseitigem präaurikulärem Schmerz und Tinnitus berichtet. Während mit einer konventionellen Myoarthropathie-Therapie nur geringe Linderung erreicht wurde, brachte eine Wurzelbehandlung komplette Symptomfreiheit. Es werden Pulpazustände diskutiert, welche Schmerz übertragen können und Empfehlungen gegeben, wie man eine mögliche pulpare Ätiologie für Beschwerden identifizieren kann.