Myofascial pain with referral from the anterior digastric muscle mimicking a toothache in the mandibular anterior teeth: a case report

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Background: Non-odontogenic toothaches often present as a diagnostic dilemma to clinicians. Myofascial pain with referral from the trigger points in the masticatory muscles are one of the common causes of non-odontogenic toothaches. However, there are limited reports of myofascial pain from the anterior digastric muscle referring pain to the mandibular anterior teeth and mimicking odontogenic pain. Case presentation: A case of non-odontogenic toothache in the mandibular anterior teeth due to myofascial pain with referral from trigger points in the anterior digastric muscle is presented. The patient had significant relief with a trigger point injection of the anterior digastric muscle. Amitriptyline 10 mg once daily was prescribed for 1 month. In addition, she was advised home care instructions to control predisposing, perpetuating, and precipitating factors, and given home care exercises, a hard joint stabilization splint, physiotherapy, and postural re-education. Conclusion: Non-odontogenic toothaches may be multifactorial. The case presented emphasizes the importance of a comprehensive evaluation to differentiate odontogenic pain from non-odontogenic pain. Irreversible dental procedures should be instituted after an accurate diagnosis and multidisciplinary management may be required in complex cases. (Quintessence Int 2020;51: 56–62; doi: 10.3290/j.qi.a43615)

Key words: anterior digastric muscle, myofascial pain, pain, temporomandibular disorder, trigger point
Myofascial pain with referral is confirmed by the presence of trigger points, pain referral to distant sites characteristic for each muscle, twitch response at the site, and reproduction of the patient’s pain complaint. It may also be accompanied by motor dysfunction and autonomic symptoms. In many instances the pain may be referred to the maxillary and/or mandibular teeth. The characteristic referral patterns of the various masticatory and accessory muscles have been described in detail by Simons et al.

Presented is a case of non-odontogenic toothache in the mandibular anterior teeth due to myofascial pain with referrals from trigger point in the anterior digastic muscle, and the management is described.

**Case presentation**

A 43-year-old woman presented to the Orofacial Pain Center with the chief complaint of pain in the mandible and mandibular teeth.

Six months previously, following an episode of intense yawning, the patient reported that she felt a “stretching sensation” in her jaw and developed pain and sensitivity in the mandibular anterior teeth. She consulted a general dental practitioner and was prescribed multiple brands of desensitizing toothpastes and medicaments, assuming her complaints were related to dentinal hypersensitivity. At the time of onset of symptoms, the patient described the pain in the alveolar process of the mandibular anterior teeth as being continuous, dull aching (20 mm on a visual analog scale [VAS]) and the pain in the mandibular anterior teeth as similar to a tooth being sensitive.

Subsequently, she was referred to an endodontist who performed root canal treatments (RCTs) of the mandibular right and left central and lateral incisors, presuming the complaints had an endodontic origin. She was prescribed multiple broad and narrow spectrum antibiotics, assuming an odontogenic infection. The medications and RCTs failed to provide relief and the pain persisted. Hence, the RCTs were repeated and finally the patient was advised to undergo extraction of the mandibular right and left central and lateral incisors and both mandibular canines 4 months after the pain complaints started. This resulted in an aggravation and change in the quality of pain (from mild, continuous, dull aching pain to severe, continuous, sharp pain [VAS 70 mm]).

The patient was then prescribed a trial of carbamazepine 300 mg once daily, pregabalin 75 mg once daily, and vitamin B12, presuming the condition to be trigeminal neuralgia. The medications were administered for a period of 3 weeks. The patient did not report any side effects at the dose administered. The medications did not have any effect on the pain.

The patient was advised to have a removable partial denture in the area of the missing mandibular anterior teeth. During the course of the dental treatment, the patient developed tenderness in her jaw and was referred to an oral surgeon. A soft night guard was fabricated. She had a mild reduction in pain with the soft night guard. She was then referred to a pain physician who in turn referred her to the Orofacial Pain Center.

Investigations ordered by previous dental practitioners and physicians included an panoramic radiograph, full-mouth radiographs, temporomandibular joint (TMJ) tomograms, computed tomography (CT) of the brain and face, magnetic resonance imaging (MRI) of the brain, complete blood count (CBC), thyroid profile, and peripheral smear, all of which were within normal limits. The CT scan showed a deviated nasal septum to the left with bilateral inferior turbinate hypertrophy. The panoramic radiograph and full-mouth radiographs were negative for dental pathology.

At the time of her presentation, the pain was severe (VAS 80 mm). In the region of the mandibular anterior teeth, the pain was sharp and continuous, with no known aggravating or relieving factors. The patient did not notice the pain during sleep. However, the patient reported disturbed sleep with difficulty initiating and maintaining sleep. The patient had gastritis and a history of right sided Bell palsy a few months prior to the onset of the symptoms of facial pain. She was prescribed prednisolone and physiotherapy for the Bell palsy. Her medical and family history was otherwise noncontributory. The patient’s job was active and involved regular bending. The patient also reported mouth breathing. Extraoral examination revealed a moderately built and nourished, conscious, cooperative patient who was well-oriented with the surroundings. She had mild deficits on the right side of the face (weakness of the facial muscles) due to Bell palsy.

TMJ and musculoskeletal evaluation revealed a range of movement that was within normal limits. She had mild tenderness on the lateral and posterior pole of the right TMJ. Muscle palpation revealed severe tenderness and trigger points in the right superficial masseter, sternocleidomastoid muscle (SCM), and anterior digastic muscle. Palpation of the trigger points in the right anterior digastic reproduced the patient’s complaints. Intraoral examination revealed an edentulous area in the region of the mandibular right and left central incisors, lateral incisors, and canines. A bony spicule was present in the region of the extraction site of the mandibular right canines.
On palpation of the bony spicule, the patient reported mild tenderness, but it did not reproduce the patient’s chief complaint. A full-mouth radiograph taken 1 month previously was negative for dental pathology. Topical local anesthetic spray was used and an infiltration of 1 mL of 2% lignocaine without epinephrine local anesthetic injection bilaterally in the region of the mandibular anterior teeth did not resolve the pain. The clinical examination, radiographs, and local anesthesia tests ruled out odontogenic sources of pain. A vapocoolant spray and stretch of the anterior digastric using ethyl chloride spray was performed and this relieved the pain of the chief complaint completely. Spray and stretch of the anterior digastric muscle using ethyl chloride spray reduced the pain significantly (VAS 80 mm prior to the procedure, VAS 30 mm subsequently). The source of pain was confirmed by palpation of the anterior digastric muscle and was relieved by vapocoolant spray and stretch. With the odontogenic causes ruled out, a diagnosis of myofascial pain due to referral from trigger point in the anterior digastric was made. The patient was advised to undergo a trigger point injection.

The patient was then referred to a pain management physician. The procedure was explained to the patient and informed consent was obtained. The area was isolated and sterilized with alcohol and povidone-iodine (Betadine). The digastric muscle was determined using ultrasound (Fig 1). Following needle placement confirmation using the ultrasound, a 1-inch long, 22-gauge needle was advanced into the anterior belly of the digastric muscle. Following negative aspiration, the 1.8 mL of 2% lignocaine without epinephrine local anesthetic injection using a Luer-Lok syringe was slowly deposited in the anterior belly of the digastric muscle with a gentle needling motion to break up the trigger point (Fig 2). The patient had complete relief of pain for 1 day (VAS 0 mm) and partial relief for 1 week (VAS reduced from 80 mm to 30 mm). She was followed up with home care instructions on controlling predisposing, perpetuating, and precipitating factors, home care exercises, hard joint stabilization splint, amitriptyline 10 mg once daily for 1 month, physiotherapy, and postural re-education. She reported substantial relief of pain (VAS 10 mm). The patient was also referred for psychological counseling and was diagnosed with comorbid depression, secondary to the facial pain. She was treated with duloxetine 20 mg once a day. The pain relief was sustained at a follow-up 16 months following treatment.

Discussion
Dental practitioners receive extensive training to diagnose and treat dental pathologies. Non-odontogenic toothache may occur due to referral of pain from structures in the head and neck such as ear, nose, and throat (ENT) pathology, sinusitis, TMD, neurovascular pain, and neuropathic pain. It often presents as a diagnostic enigma. Myofascial pain with referral from trigger points in the masticatory muscles can frequently refer to intraoral structures and other distant structures. The pain in these instances can mimic odontogenic pain. Previously, cases of non-odontogenic toothache due to referral from trigger points in the masseter and other masticatory muscles have been described.
In the present case, the pain in the mandibular anterior teeth and mandible was misdiagnosed as pain of odontogenic origin and irreversible procedures were performed. The institution of irreversible procedures resulted in progression of the condition. The case highlights the importance of carefully collecting a patient history combined with a comprehensive clinical examination. This facilitates the arrival at an accurate diagnosis of the source of pain, before initiation of an irreversible procedure.10 Odontogenic pain may also co-exist with other orofacial pain conditions or headache disorders. 15,16 In such instances, a local anesthetic injection block may be a useful adjunct tool to differentiate odontogenic pain from non-odontogenic pain. The complete cessation of pain with local anesthetic injection block generally indicates odontogenic origin. A paradigm for the diagnosis of non-odontogenic toothache due to myofascial trigger points is presented in Fig 3.

Non-odontogenic pain may be referred from different masticatory muscles and accessory muscles and masquerade as a toothache. The patterns of referral and method of palpation of trigger points have been detailed in the Trigger Point Manual by Simons et al.1 Trigger points in the anterior, middle, and posterior temporalis may refer pain to the maxillary anterior region, premolars, and molars, respectively. Similarly, the trigger points in the masseter can refer to the mandibular molars, and anterior digastric trigger points can refer pain to the mandibular anterior region.

The function of the anterior digastric muscle is to depress and retrude the mandible. The action of the digastric muscle is especially important at maximum opening and quick or forced jaw opening. The digastric muscle has a predominance of Type II muscle fibers, which enables quick opening; however, it has a very few muscle spindles and Type I muscle fibers. Thus it is unable to maintain prolonged tension.3 Trigger points in the digastric often develop in patients with parafunctional habits like bruxism, mouth breathing (it may be secondary to nasal obstructions such as a nasal polyp, or structural abnormalities in the nose such as a deviated nasal septum),3 and episodes of intense yawning. Trigger points in the masseter and other elevator muscles of the jaw may also result in trigger points in the digastric muscle.3 Additionally, it has been suggested that key trigger points in the SCM may also induce satellite trigger points in the anterior digastric muscle.3 As mentioned previously, the patient was a mouth breather, which could have predisposed her to developing trigger points in the digastric muscle.

A comprehensive evaluation of the masticatory muscles is essential. Reproduction of the patient’s pain complaint during
the clinical examination can help diagnose the source of pain. Table 1 describes the differentiating features between odontogenic and non-odontogenic pain by myofascial trigger points. In the present case, the diagnosis was confirmed by reproduction of the patient’s pain complaint by palpation of the anterior digastric muscle, failure of local anesthetic injection blocks to relieve pain in the mandibular anterior teeth, negative findings with intraoral radiographs and intraoral examination, and relief of pain through vapocoolant spray and stretch followed by trigger point injections. The trigger point injections were accomplished using lignocaine without epinephrine. Epinephrine is generally avoided in trigger point injections as it may be myotoxic and constrict blood flow to the muscles. The treatment was multidisciplinary. The case also reflects the importance of cross-referrals between physicians and dental practitioners to aid in successful diagnosis and management of complex cases. Predisposing, perpetuating, and precipitating events were identified, and addressed to prevent further recurrences.

Table 1  Differential diagnosis of odontogenic vs non-odontogenic pain from myofascial trigger points

<table>
<thead>
<tr>
<th>Odontogenic pain</th>
<th>Non-odontogenic pain from myofascial trigger points</th>
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</thead>
<tbody>
<tr>
<td>Dental pathology such as caries, apical periodontitis</td>
<td>Positive</td>
</tr>
<tr>
<td>Percussion of tooth</td>
<td>Positive</td>
</tr>
<tr>
<td>Palpation of trigger point</td>
<td>No change</td>
</tr>
<tr>
<td>Response to spray and stretch</td>
<td>No change</td>
</tr>
<tr>
<td>Response to local anesthetic injection into trigger point</td>
<td>No change</td>
</tr>
<tr>
<td>Response to local anesthetic injection at tooth site</td>
<td>Pain reduction</td>
</tr>
</tbody>
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Treatment of myofascial pain includes trigger point spray and stretch, trigger point pressure release, trigger point injections, home care instructions, corrective actions, pharmacotherapy, appliance therapy, psychological counseling, and addressing comorbidities such as depression, physiotherapy, and postural re-education. The management paradigm for digastric trigger points is detailed in Fig 4. Trigger point spray and stretch, and trigger point pressure release is the first step. This aids in confirming the diagnosis and may be therapeutic in mild cases. If it provides relief or the relief is temporary, it may be followed with a trigger point injection. Identification and treatment of predisposing, perpetuating, and precipitating events is crucial for successful treatment and prevention of recurrences. Patients are counselled on home care instructions, corrective actions, and exercises to prevent recurrences. Pharmacotherapy of myofascial pain includes muscle relaxants such as cyclobenzaprine, carisoprodol, and amitriptyline. Amitriptyline and nortriptyline may be beneficial in chronic myofascial pain or patients with myofascial pain and concomitant sleep disturbances. Amitriptyline is a tricyclic antidepressant that is well validated in low doses for chronic pain. It is a serotonin-norepinephrine reuptake inhibitor, and is especially beneficial in chronic pain patients with sleep disturbances such as the present patient. Although the mechanism of action is still unclear, appliances such as a TMJ stabilization appliance have been found to be beneficial in patients with TMD and are recommended in cases of painful TMD or TMD cases that present with functional limitations. Patients with orofacial pain conditions may have comorbidities such as depression, and in such instances psychological counseling and psychiatric evaluation may be essential. Many cases of TMD may persist or recur, and in such cases physiotherapy may be recommended. Postural re-education is also performed in patients with forward head posture or poor work ergonomics. In the present patient, pharmacotherapy and appliance therapy were done in the early stages of treatment following trigger point spray and stretch and trigger point injection.

General dental practitioners may encounter patients with complaints of pain in the teeth or alveolar process in the absence of dental pathologies on clinical and radiographic examination. In these instances, an accurate history and comprehensive clinical examination may help in locating the source of pain. The site of pain is often different from the source of pain in myofascial pain with referral. In patients with myofascial pain with referral from trigger points in the anterior digastric muscle, the site of pain may be the alveolar process of the mandible and the mandibular anterior teeth, whereas the source of pain is the anterior digastric muscle. Hence, emphasis should be on diagnosing and treating the source of pain rather than the site of pain.
The key to successful treatment of toothache of non-dental origin lies in an accurate diagnosis. An accurate diagnosis stems from a logical process combining history, comprehensive clinical evaluation, use of appropriate diagnostic aids, and in certain instances, a trial of therapeutic agents.

Conclusion/recommendation

A case of myofascial pain with referral of the anterior digastric presenting as a non-odontogenic toothache in the mandibular anterior teeth was described. The management of the case with trigger point injections, pharmacotherapy, and physiotherapy was detailed. Trigger point injections to the anterior digastric muscle may be complicated to accomplish in a general dental clinic; however, the history and examination (including palpation) are not. It is mandatory for general dental practitioners to institute appropriate referrals for further evaluation and management when necessary, such as in cases where odontogenic causes of toothache or facial pain may be a factor or when a diagnosis is not apparent. Thoroughness in patient care is crucial and, as this case study illustrates, can result in avoidance of unnecessary, harmful, and/or irreversible procedures.

![Fig 4](Image) Flow chart depicting the management paradigm for digastric trigger points.

References
