



Dry needling technique in myogenous temporomandibular disorders: A clinical commentary

Dry needling technique has gained huge popularity in recent years, and physical therapists (PTs) all around the globe are keen to learn this technique. Dry needling is a skilled intervention provided by PTs that uses a monofilament needle to advance into the skin and to treat the underlying myofascial trigger points (MTrPs), muscular tissues, and connective tissues for neuromuscular pain and movement impairments.^[1] Dry needling is certainly different from acupuncture in a very fundamental way. Acupuncture is a traditional form of Chinese assessment and treatment system, whereas dry needling is thoroughly based on western scientific principles. Except for the usage of needles both is completely different in terms of assessment and treatment. APTA and AAOMPT had released positional statements stating that dry needling is falling under the scope of physiotherapy.^[2] About 36 states in the USA have approved PTs to practice dry needling. PTs in other countries such as Canada, UK, Australia, New Zealand, South Africa, and India are regularly using dry needling technique to treat patients with pain and movement dysfunction.

Although there are various schools of thought in dry needling, the trigger point dry needling is the widely accepted form of dry needling. Dry needling targets the MTrPs, which is the common cause of pain and dysfunction. A MTrP is defined as hyperirritable spot in the taut bands of the skeletal muscle that are tender to touch and that cause local and referred pain.^[3] About one-third of the patients with musculoskeletal pain meet the diagnostic criteria for myofascial pain syndrome.^[4]

Dry needling is used in all common musculoskeletal conditions and recently PTs are finding a good degree of success in treating temporomandibular disorders (TMD). TMD is a very common problem affecting up to 33% of people within the lifetime.^[5] The causes can be odontogenic (dental issues), arthrogenic (joint and disc issues), and myogenic (trigger points, tightness, spasm).^[6]

Myogenic causes of TMD are often characterized by the presence of MTrPs in the masticatory and craniocervical muscles. It includes masseter, temporalis, medial pterygoid, lateral pterygoid, digastric, sternocleidomastoid, splenius capitis, suboccipital muscles, and upper trapezius. Each muscle can have one or more MTrPs within it, which can refer pain both locally and to the distant site (Figure 1). Some of the referral pains can be even misdiagnosed as a headache, ear pain, tinnitus, sinus block, tooth ache, etc. Studies show that one-third of the patients suffering from ear pain are actually due to TMD.^[7]

Hence, these patients seek help from varied specialties in line with their referral symptoms (Table 1). Sometimes, the dentist might extract the teeth presuming that the pain is emanating from the tooth. Neurologist and ENT specialists assess and treat this condition in perspectives related to their domain, and they even might refer them for further investigations.

It is imperative that these patients are properly tested for myogenous sources of their pain and be referred to the PTs who have expertise in treating such problems. Most of the times, these patients will be juggled between different specialties seeking for a permanent cure. Such delay in the treatment will only add more chronicity to the condition.

Myogenous TMD, regardless of the chronicity, tend to respond swiftly with dry needling technique. After precise palpation of the involved muscles, the needles are advanced into the muscle to hit the MTrP. Ideally, a fast-in and fast-out technique must be employed to elicit a local twitch response (LTR).^[8] An LTR is a momentary contraction (fasciculation) of the taut band in response to mechanical stimulation. An LTR is visible or palpable when a needle hits the MTrP. Thus, elicitation of the LTR is diagnostic criteria for the presence of MTrP.^[9] Elicitation of LTR indicates that the needled point is correct; hence, it is assumed that the underlying MTrP was treated correctly. LTR is also strongly associated with imminent pain relief.

Apart from pain relief, the jaw clicks would reduce and mouth opening improves. Although the patient might feel pain during and after the treatment, most of the times with proper patient education, the treatment is well tolerated. There are randomized controlled studies and case series done to find the efficacy of dry needling on masticatory muscles. Masseter, temporalis and lateral pterygoid are the common muscles needled. The result revealed that after dry needling, the pain pressure threshold had improved, pain decreased and mouth opening improved compared to the control or sham group.^[10] One particular study revealed that patients with a cervicogenic headache having associated TMD with a prevalence of 44.1%. Moreover, the group which received additional treatment for their TMD had shown better clinical outcomes in terms of their headache and neck functions.^[11] Another study done by Fernandez-Carnero *et al.* found that dry needling over the masseter muscle reduced the pain pressure threshold and increased the maximum mouth opening.^[12] There is also a single case study done on a unilateral ear pain successfully treated by dry needling on

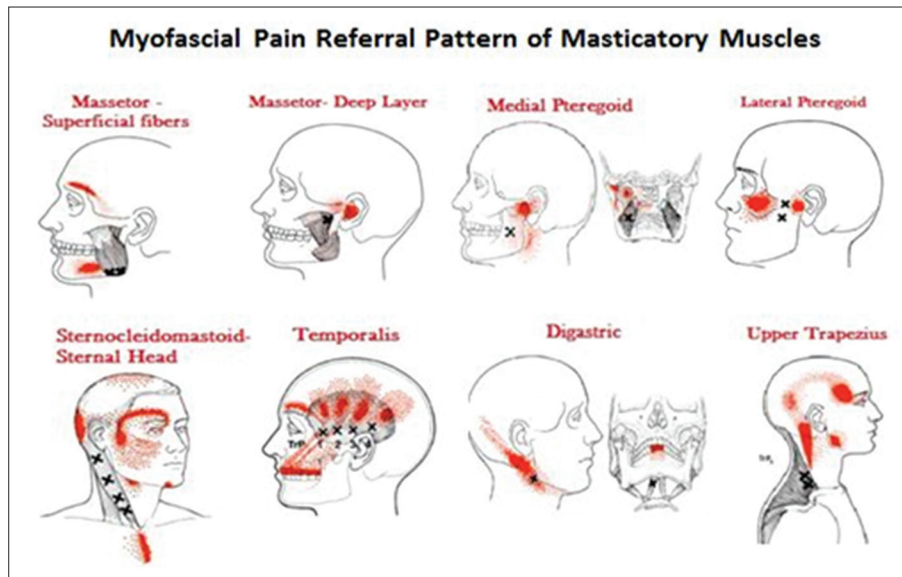


Figure 1: Pain referral pattern of myofascial trigger points

Table 1: Common symptoms pertaining to myogenous TMD^[6]

Pain over the jaw, teeth, ear, forehead
Limited MMO
Sense of stiffness and fatigability in the masticatory muscles
Associated neck pain, head ache, ear block
Concomitant TMJ disc issues like clicking, locking, Jaw deviation
Difficulty in eating, yawing, laughing, eating
Altered behavior and psycho-social functioning

TMJ: Temporomandibular joint, TMD: Temporomandibular disorders, MMO: Maximal mouth opening

Table 2: Physiological mechanism of dry needling

Mechanical disruption of MTrPs thereby release its contraction knots
Normalizes the chemical; environment and reduces the chemical irritation
Distal axonal denervation that ceases the sustained Ach release over MTrPs
Infiltration of the new tissue growth factors like PDAF to promote healing
Blockage of C – fibers due to A delta stimulation – pain gate mechanism
Descending pain control – release of endorphin, dynorphin etc., (happy hormones)

MTrPs: Myofascial trigger points, PDAF: Platelet-derived angiogenesis factor

temporomandibular joint muscles.^[13] Similarly, there are other studies supporting the usage of Dry Needling for MTrPs in the other regions of the body. Unfortunately, masticatory muscle MTrPs are not generally considered as a cause of pain and dysfunction in TMD patients. Considering these MTrPs and treating it using dry needling would offer an effective solution to resolve such conditions.

The mechanism of dry needling was proposed in various studies (Table 2). There are many ways by which the dry needling helps to relieve pain.^[14] The actual mechanism of dry needling is debated, but PTs performing dry needling believe that eliciting LTR is vital for pain relief. This LTR, when coupled with stretching, helps to relax the actin-myosin bonds, thereby loosening the tight bands.^[15] In addition, dry needling of the MTrPs will help to normalize muscle tone and the neurological interface, and improve the flow of acetylcholinesterase, thus correcting bradykinin, calcitonin gene-related peptide, and substance P levels in the affected muscle.^[16] It is certain that there are many ways that dry needling helps in altering the pain and dysfunction.

Dry needling offers excellent scope to PTs treating TMDs. Other medical specialties must be aware of myogenous TMD and must refer those types of patients to PTs, who are licensed to perform dry needling. Ideally, every dental hospitals and colleges must have PTs visiting their facility to offer therapy to TMD patients because the dentists are the first contact practitioners for these patients. Before addressing odontogenic sources, these patients must be screened for myogenous sources of pain and treated accordingly, (Table 3). It must be a team work between dentists and PTs to decide on who has to intervene first. The interrelationship between dentistry and physiotherapy in TMD was well proven in a study on 300 TMD patients.^[17] This study did not mention anything related to dry needling usage but in myogenous TMD, usage of dry needling would offer great benefit to the patients.

Conclusion

TMD is quite a common disorder that causes significant pain and disability. Despite its high prevalence, these patients hardly

Table 3: Clinical tips for physical therapists treating TMD

Palpate the TMJ muscles and try to correlate the findings with patient's symptoms

Look for the cervical spine posture and its muscular imbalances in TMD

Identify and address parafunctional habits like gum chewing, nail biting, bruxism etc.

Perform dry needling precisely into the muscles harboring MTrPs

Do realize the role of psychosocial and cognitive factors in TMD

Rule out the odontogenic TMDs before giving and physical therapy intervention

Dry needling resolves the MTrPs quickly if the patient has a primary myofascial pain

TMJ: Temporomandibular joint, TMD: Temporomandibular disorders, MTrPs: Myofascial trigger points

visit to physiotherapy clinic. A high level of unawareness prevails in this area and PTs must take initiative to create awareness so that those patients turn to PTs for therapy. Dentist must also have awareness and knowledge in this area so that they can do appropriate referral. Dry needling will give dramatic results in TMD patients if the patients are correctly assessed and treated. With that, these patients can have a pain free and quality life. PTs must get appropriately trained and licensed to needle these critically positioned muscles.

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