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Case report

Immediate effect of DNT on frontal headache and otalgia originating from temporalis and masseter trigger points: a case report and physiotherapy management

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ABSTRACT

Chronic tension-type headache (CTTH) and migraine are frequently associated with myofascial trigger points **(TrPs)** in the neck, head, and shoulder muscles. Dry needling, a minimally invasive physiotherapy technique, effectively deactivates TrPs. This case highlights its rapid impact on frontal headache and ear pain. A 35-year-old female educator reported ongoing dull pain centered around her right eye and forehead, accompanied by discomfort in her ear. An examination by an ENT specialist revealed no evidence of underlying ENT pathology, while a physiotherapy evaluation revealed active trigger points in the right temporalis and masseter muscles, along with a history of teeth grinding. Management incorporated dry needling therapy (DNT) to the temporalis and masseter muscles while maintaining sterile conditions, followed by ischemic compression, ultrasound treatment, focused stretching, postural adjustments, and behavioral education. The patient reported an immediate decrease of about 60% in pain intensity following the initial needling session. Over the course of five treatment sessions, the Visual Analogue Scale (VAS) score decreased from 6/10 at rest to 2/10. The Pain Disability Index (PDI) score reduced from 38/70 (moderate disability) at baseline to 12/70 (minimal disability), indicating substantial functional improvement. This case illustrates how DNT, when used alongside multimodal physiotherapy, can quickly alleviate facial pain and associated symptoms arising from trigger points in the temporalis and masseter muscles. It is essential to promptly identify musculoskeletal origins when ENT and dental conditions have been ruled out.

Keywords: Headache, Tension-type, Migraine disorders, Myofascial pain syndromes, Trigger points, Dry needling, Facial pain.

INTRODUCTION

Myofascial trigger points (TrP) are often one of the most neglected and disregarded sources of musculoskeletal discomfort. Research indicates that TrP may be a frequent primary issue rather than a consequence of other medical conditions. In other terms, TrP can arise without any underlying health problems and can serve as an independent source of pain. However, TrP can also coexist alongside various musculoskeletal disorders, including osteoarthritis of the hip or knee joint, as well as visceral issues such as endometriosis, interstitial cystitis, irritable bowel syndrome, dysmenorrhea, or prostatitis [1].

Simons et al. have outlined the pain referral patterns associated with various trigger points (TrPs) in several muscles of the head and neck, which can potentially cause pain in the head: upper trapezius, temporalis, sternocleidomastoid, splenius capitis, suboccipital muscles, among others. Since tension-type headache (TTH) is marked by bilateral, pressing or tight sensation; pressure or a band-like constriction; and/or heightened tenderness upon palpating the neck and shoulder muscles, these characteristics of pain are similar to the descriptions of referred pain that arise from TrPs [2].

Chronic tension-type headache (CTTH) and other primary headache disorders are frequently associated with myofascial trigger points (TrPs) in the neck, head, and shoulder muscles.

Facial pain is a common presenting symptom in ENT and dental clinics. When routine investigations fail to identify any pathology, musculoskeletal sources such as Myofascial Pain Syndrome **(MPS)** should be considered [3].

MPS involves hyperirritable spots within taut bands of skeletal muscle known as trigger points which can cause referred

pain patterns that mimic other conditions. Bruxism, faulty posture, and occupational stress are common contributing factors [4].

This case report presents a female school teacher with frontal headache, inner ear and facial pain managed successfully through a physiotherapy-based multimodal approach [5].

Objectives

To present the effectiveness of Dry needling therapy on frontal headache and Otalgia due to temporalis and Masseter trigger points [6].

Case description

A 35-year-old female school teacher presented with complaints of pain in the inner ear region, radiating to the right periorbital and frontal regions for the past 3 months, with an increase in pain over the last 2 days.

Referral Source

Referred by an ENT specialist following negative ENT pathology findings.

History

The patient reported experiencing a persistent, dull pain in the face that radiated to the right forehead area, worsened by work-related stress and extended periods of poor posture. An assessment of the patient's job indicated that it required long periods of speaking, writing on a board, and maintaining a forward-head posture. Furthermore, the patient acknowledged engaging in parafunctional behaviours like teeth grinding, especially during times of psychological stress and while asleep.

Examination

Posture: Mild forward head posture and right upper trapezius elevation.

Palpation: Active trigger points in right temporalis and masseter causing referred pain.

VAS (Pain): 6/10 at rest; 8/10 during activity.

The Pain Disability Index (PDI) score 38/70 (moderate disability) at baseline.

PT intervention

Goals

Reduce facial and referred pain

Deactivate trigger points

Improve cervical and muscle flexibility

Address postural and behavioural factors

Treatment

Dry Needling: The dry needling (DN) technique for each active myofascial trigger point **(AMTrP)** involves a specific position for the patient and a needle insertion method tailored to the muscle. Prior to the procedure, skin disinfection was conducted on all muscles (Temporalis and Masseter) to minimize the risk of infection, and a uniform needle size was used a smaller needle (0.32 mm × 25 mm) was employed. The DN technique was performed directly on the AMTrP, with the goal of eliciting all local twitch responses as described by Travell and Simons. The techniques implemented included in-and-out needling or needle winding for muscles with a significantly large diameter and no hazardous structures nearby, while the bidirectional rotation technique was utilized for muscles with flatter bellies (such as temporalis, masseter muscles and for those located near critical structures like blood vessels and nerves (e.g., rectus capitis posterior major, obliquus capitis superior, and inferior). (Figure 1 to 4).

Applied to active trigger points in right temporalis and masseter muscles under aseptic precautions using a smaller needle (0.32 mm × 25 mm) was used.

Immediate pain relief of approximately 60% reported post-session.

Manual therapy

Ischemic pressure release on masseter and temporalis muscles [7].

Suboccipital release for reducing cranio-cervical tension [8-10].

Figure 1: Needle inserting technique for temporalis

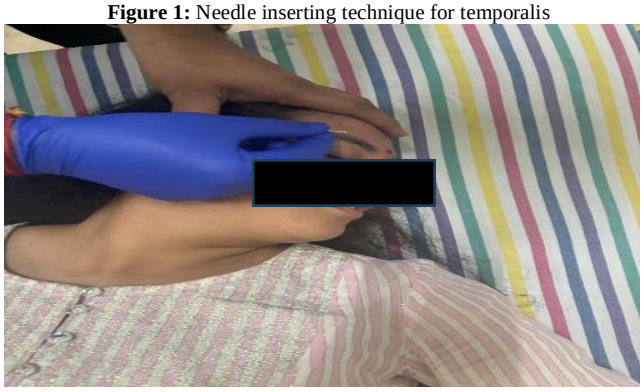

Figure 2: Needling on temporalis trigger point

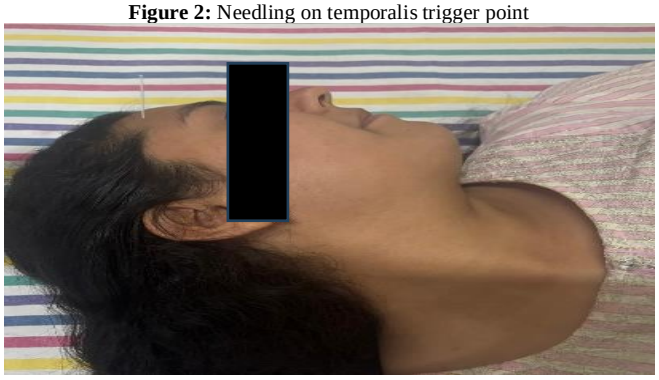

Figure 3: Needle inserting technique for masseter muscle

Figure 4: Needling on masseter muscle trigger point

Electrotherapy
Ultrasound therapy (1 MHz, continuous, 1.2 W/cm² for 5 mins) over temporal, masseter and upper trapezius.

Stretching exercises
SCM, levator scapulae, upper trapezius (3–5 reps, 30-sec holds)

Gentle stretching of temporalis and masseter (with guidance).

Postural advice and behavioural education
Ergonomic correction during teaching

Stress management techniques

Awareness of jaw resting position and avoiding clenching.

RESULT

After the dry needling treatment, there was a significant decrease in both pain intensity and functional impairment. The initial score on the Visual Analogue Scale (VAS) was 6/10 while at rest and 8/10 during activities, which dropped to around 3–4/10 (about 60% relief) right after the first dry needling session, and further decreased to 2/10 after completing five sessions. Tenderness at the trigger points, which was initially noted in the masseter and temporalis muscles, showed significant reduction right after treatment and was greatly diminished by the end of the treatment series. The Pain Disability Index (PDI) score also reflected notable improvement, falling from 38/70 (indicating moderate disability) at the start to 28/70 (suggesting mild to moderate disability) following the first session, and improving to 12/70 (indicating minimal disability) after five sessions, demonstrating a steady enhancement in overall functional status [10-12].

Table 1: VAS, TrP tenderness and PDI values after Dry needling therapy

Parameter	Initial Value	After Dry Needling (Immediate)	After 5 Sessions
Visual Analogue Scale	6/10 (rest), 8/10 (activity)	3–4/10 (approx. 60% relief)	2/10
Trigger Point Tenderness	Present in masseter/temporalis	Markedly reduced	Significantly reduced
PDI	38/70 (moderate disability)	28/70 (mild–moderate disability)	12/70 (minimal disability)

No negative events were noted concerning the intervention. The patient commonly experienced mild soreness in the upper trapezius, masseter muscles following the needling technique as a side effect. In all instances, this side effect resolved within 48 hours without requiring any specific treatment.

DISCUSSION

Dry needling has been shown to produce rapid analgesia in myofascial trigger points by disrupting the dysfunctional motor end plate activity and altering central pain processing 10. The dry needling (DN) technique for each active myofascial trigger point (AMTrP) involves a specific position for the patient and a needle insertion method tailored to the muscle. Before the procedure, skin disinfection was conducted on all muscles to minimize the risk of infection, and a uniform needle size (0.32 mm × 40 mm) was utilized, except for the sternocleidomastoid, zygomatic major, and superficial muscles (occipitofrontal and temporal), for which a smaller needle (0.32 mm × 25 mm) was employed.

The DN technique was performed directly on the AMTrP, with the goal of eliciting all local twitch responses as described by Travell and Simons. The techniques implemented included in-and-out needling or needle winding for muscles with a significantly large diameter and no hazardous structures nearby, while the bidirectional rotation technique was utilized for muscles with flatter bellies (such as temporalis, occipitofrontalis anterior and posterior, and zygomaticus major) and for those located near critical structures like blood vessels and nerves (e.g., rectus capitis posterior major, obliquus capitis superior, and inferior).

In this case, targeting the temporalis and masseter trigger points with dry needling produced an immediate pain reduction of approximately 60%, allowing the patient to engage more effectively in stretching and postural re-education. The Pain Disability Index (PDI) score reduced from 38/70 (moderate disability) at baseline to 12/70 (minimal disability), indicating substantial functional improvement. This aligns with existing literature supporting dry needling as an effective adjunct for MPS-related craniofacial pain.

CONCLUSION

This case demonstrates that myofascial pain syndrome can mimic ENT-origin facial pain and that a comprehensive physiotherapy approach — including dry needling, manual therapy, electrotherapy, and ergonomic strategies — can yield rapid and sustained improvements. The immediate effect of dry needling in this patient underscores its value as an adjunctive tool for trigger point deactivation in temporalis and masseter muscles.

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Conflict of interest
There was no conflict of interest for this study.

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