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An overlooked cause of hand pain: myofascial trigger points in the interosseous muscles

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Myofascial pain syndrome is a common musculoskeletal disorder that can affect any skeletal muscle in the human body[1]. Myofascial trigger points cause pain through a combination of muscle fiber contractures, local ischemia, and sensitization of nociceptors. These changes result in both localized and referred pain patterns, affecting adjacent muscles and contributing to chronic pain syndromes. Myofascial trigger points in the interosseous muscles are often induced by repetitive strain, trauma, and biomechanical stress. Activities involving continuous hand use, such as typing or playing musical instruments, can fatigue these muscles, while trauma and poor hand positioning increase tension and the risk of trigger points. Additionally, ulnar nerve entrapment and chronic stress contribute to sustained muscle contractions and localized ischemia, both of which facilitate trigger point formation[2].

Myofascial pain and trigger points, though widely recognized among musculoskeletal specialists, remain relatively underexplored within the diagnostic imaging community. Imaging techniques contribute primarily by excluding other potential causes of pain and providing anatomical guidance for therapeutic interventions. Trigger points may appear as hypoechoic ellipsoid, fusiform, or oval shapes close to the deep fascia within the muscle. The rate of detection with ultrasound is around 30 percent[3]. In fact, trigger points in the dorsal interosseous (DI) muscles can be an important cause of hand pain, though they may be overlooked by clinicians. The interosseous muscles originate from the metacarpal bones and attach to the bases of the proximal phalanges. The DI muscles are deep-seated muscles that originate from the adjacent surfaces of the two metacarpal bones, and their primary function is the abduction of the fingers. Although the main action of the DI muscles is to abduct the fingers, they are also active during extension of the interphalangeal joints when the metacarpophalangeal joints are flexed[4].

The myofascial trigger point (MTrP) of the DI muscles can produce a pain pattern similar to osteoarthritis of the first carpometacarpal joint and may exacerbate existing osteoarthritis[5]. Additionally, MTrPs of the third and fourth DI muscles can cause referred pain along the edge of the finger, the dorsum of the hand, and the ulnar side of the fifth finger. These pain patterns are similar to those seen in C7 or C8 radiculopathies and ulnar neuropathies, as well as the pain seen in triangular fibrocartilage complex injuries and arthritis. Therefore, the identification of MTrPs in the DI muscles should be considered in the context of pain in the ulnar aspect of the hand and wrist, especially in the absence of other neurologic abnormalities or inflammatory conditions[1] (Fig. 1A).

The purpose of this communication is to present the effectiveness of dry needling for the treatment of interosseous muscle MTrPs causing hand pain. In our study, trigger points were diagnosed through a combination of physical examination and ultrasound imaging. Clinicians palpated the interosseous muscles to identify areas of tenderness, taut bands, and referred pain patterns consistent with trigger points. Ultrasound imaging was used to confirm these findings, allowing for precise localization of the affected muscle regions and distinguishing them from other potential causes of pain. Dry needling is effective in treating myofascial trigger points by disrupting muscle contractures and improving local blood flow. Needle insertion induces a local twitch response, helping to release muscle tension and decrease nociceptive input, ultimately leading to pain relief.

All procedures were conducted under aseptic conditions to minimize the risk of infection. We used 0.16 × 25 mm needles for superficial dry needling of the interosseous muscles. In cases where patients had thin or sensitive skin, shorter needles were selected to reduce discomfort and potential trauma. Patients were positioned supine with the forearm pronated and hand in a neutral position. Trigger point dry needling can be performed using a straight palpation technique. In the flat palpation technique, the skin should be palpated at a right angle from the dorsal to the palmar direction (Fig. 1B). For ultra-

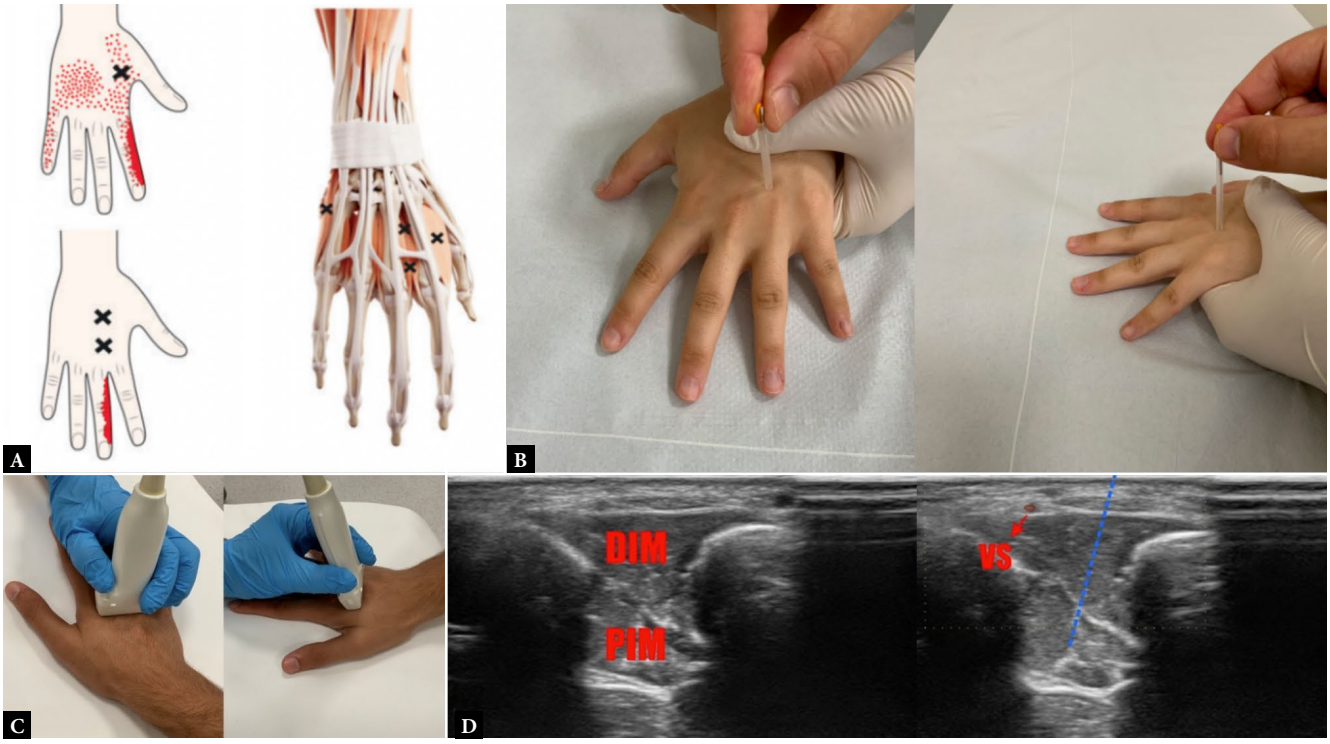

Fig. 1. A. *Referred pain areas of interosseous muscles trigger points;* **B.** *dry needling technique with flat palpation and perpendicular application, top and side views;* **C.** *ultrasound-guided approach, placement of the ultrasound probe and dry needling position;* **D.** *ultrasound imaging of dorsal and palmar interosseous muscles, with avoidance of superficial veins. The figures are published with the permission of Hipokrat Kitabevi*

sound-guided dry needling, the probe is placed obliquely between the metacarpal bones on the short axis of the interosseous space with the forearm pronated and the hand in a neutral position (Fig. 1C). In cases where blind needling was performed, careful palpation was used to localize trigger points, though ultrasound guidance was preferred to increase precision and reduce complications. After locating the trigger point by palpation or ultrasound, the needle was inserted into the muscle tissue at an angle between 0–45 degrees until a local twitch response was elicited. The needle was moved gently within the muscle to achieve relaxation. For ultrasound-guided procedures, continuous imaging ensured precise needle placement and minimized the risk of vascular injury[6] (Fig. 1D). Studies have shown that ultrasound-guided dry needling can significantly improve both the efficacy and safety of the procedure[7]. In the short term, patients typically reported immediate pain relief. Mid-term benefits included improved range of motion and reduced frequency of pain episodes, observed within 1–3 months post-treatment. Long-term outcomes varied, with some patients requiring additional sessions for sustained relief, based on their individual response. Observed complications were minimal, including temporary soreness, minor bruising, and mild discomfort at the needle insertion site. No significant adverse events were recorded, and all minor complications resolved within a few days without intervention.

Our findings suggest that ultrasound-guided dry needling of the interosseous muscles effectively reduces hand pain and improves functional outcomes. This aligns with previous studies, such as Choi *et al.*[1], which identified the role of interosseous muscle trigger points in hand pain syndromes. Our study builds upon this evidence by demonstrating the precision of ultrasound-guided needling in targeting these muscles, potentially enhancing pain relief outcomes. This finding is consistent with Diep *et al.*[6], who reported the advantages of ultrasound guidance in myofascial interventions. While previous studies have primarily focused on palpation-guided needling, our use of ultrasound guidance allowed for more precise localization, potentially improving therapeutic outcomes, as suggested by Perreault *et al.*[6]. Compared to traditional palpation-guided methods, ultrasound guidance offers a clear advantage by enhancing needle placement accuracy, minimizing complications, and potentially leading to faster and more reliable pain relief. In comparison to other treatments, such as pharmacological interventions or physical therapy, dry needling provides targeted relief with minimal systemic effects, and ultrasound guidance enhances its efficacy and safety profile. This makes it a valuable alternative for patients who may not respond well to conventional therapies or who prefer minimally invasive options.

We expect that dry needling of the dorsal interosseous muscles will result in a significant reduction in hand pain and improvement in function among participants. Additionally, the study aimed to assess the accuracy of ultrasound guidance in localizing trigger points compared to palpation alone.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organizations which might negatively affect the contents of this publication and/or claim authorship rights to this publication.

Ethical statement

Written and verbal consent was obtained from the patient.

Author contributions

Original concept of study: BA, BTD, MHT, MTY. Writing of manuscript: BA, BTD, MHT, MTY. Analysis and interpretation of data: BA, MTY, FB. Final acceptation of manuscript: BA, BTD, MHT, FB. Collection, recording and/or compilation of data: BA, MHT, FB. Critical review of manuscript: BA, BTD, MTY, FB.

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