CASE REPORT

Dry Needling a Novel Treatment Option for Post-scar Neuralgia: A Case Report
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ABSTRACT
Local injection therapies, often referred to as “wet needling”, use hollow-bore needles to deliver corticosteroids, anesthetics, sclerosants, botulinum toxins, or other agents.¹,² In contrast, “dry needling” refers to the insertion of thin monofilament needles, as used in the practice of acupuncture, without the use of injectate.³-⁴ Dry needling is typically used to treat muscles, ligaments, tendons, subcutaneous fascia, scar tissue, peripheral nerves, and neurovascular bundles for the management of a variety of neuromusculoskeletal pain syndromes.³,⁶,⁷ Given the broad base of international literature presently available on the technique, it is particularly concerning that the primary US-based, National Physical Therapy Association¹ and several State Boards of Physical Therapy¹⁰-¹³ have recently narrowed their definition of dry needling to an “intramuscular” procedure, i.e., the insertion of needles into nodules within taut bands of muscle, more commonly referred to as “trigger points” (TrPs) or “myofascial TrPs” (MTrPs).

As early as 1977, Melzack et al.¹⁴ stated that “trigger points are firmly anchored in the anatomy of the neural and muscular systems… and the stimulation of particular nerves or tissues by needles could bring about an increased input to the central biasing mechanism, which would close the gates to (pain) inputs from selected body areas.”¹⁴

The lateral cutaneous nerve of the thigh is part of the lumbar plexus. It functions primarily as a sensory nerve and its composition varies among individuals with several different combinations of lumbar nerves that originate from L1 to L3.¹⁴ The lateral cutaneous nerve of the thigh then emerges at the lateral border of the psoas major, crosses the iliacus, to the anterior superior iliac spine. The nerve then passes under the inguinal ligament and over the sartorius muscle and enters the iliacus, to the anterior superior iliac spine. The nerve then passes

CASE DESCRIPTION
A 64-year-old male patient presented at our outpatient department with complaints of the left thigh pain along the anterolateral aspect extending till the knee. The pain was electric shock like associated with tingling. Pain aggravated on walking and standing, and was relieved on rest. The patient had an accident and injured his left hip in 2001 and underwent surgery for the same. The pain started 2–3 months after the surgery. The patient was a known diabetic and hypertensive since 10 years and was on treatment for the same.

On examination, there was an altered sensation over the left anterolateral aspect of the thigh, and Tinel sign was positive. Sensory examination, motor power, and reflexes were normal. Electromyography (EMG)/nerve conduction velocity (NCV) studies revealed left lateral cutaneous nerve of thigh neuropathy.

We had made a diagnosis of entrapment neuropathy of the left lateral cutaneous nerve of the thigh and was started on medications like tab. baclofen 20 mg od and paracetamol 1,000 mg tds, but the patient did not have any pain relief. An injection of lignocaine with 5% dextrose and methylprednisolone was done below the scar tissue around the lateral cutaneous nerve of the thigh. The patient reported pain relief. Later, an ultrasound-guided radiofrequency ablation of the left lateral cutaneous nerve of the thigh was carried out, but still, the patient did not have any pain relief.

We had to exclude the diagnosis of entrapment neuropathy as ablation of the lateral cutaneous nerve of the thigh did not produce...
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Discussion

The first, peer-reviewed journal article on dry needling published by a Western, medical physician, did not limit needle insertion to muscular TrPs rather, the 241-patient study reported that only 2 of the 14 target structures were muscular TrPs. The other structures needed included ligaments, scar tissue, tendons, bones, and tendo-osseous insertion sites, all of which are types of connective tissue. In addition, “a high density of neurovascular structures” has been found at dry needling target sites.

The initial response of pain relief in our patient to the injection of lignocaine into the scar tissue can be attributed to the membrane-stabilizing effects of local anesthetics. Membrane stabilizing effects involve the inhibition or total abolishment of action potentials from being propagated across the membrane. This phenomenon is common in nerve tissues as they are the carrier of impulses from the periphery to the central nervous system. Membrane stabilization blocks the propagation of action potentials across nerve cells, thereby producing a nerve block.

Likewise, there is robust evidence that peri-neural needling of non-TrP structures helps reduce pain and disability while improving sensory and motor nerve conduction velocities. Perineural needling has also been shown to stimulate microcirculation in patients with mild to moderate carpal tunnel syndrome.

The biomechanical, chemical, and vascular effects of needling either superficial subcutaneous tissue (non-muscular) or deep intramuscular tissue without injectate have been well documented. Microcirculation around the knee joint has been demonstrated following “dry” needling into non-TrP locations, and improved muscle blood flow has been found following “manual acupuncture” in the lower extremities.

Dry needling done in and around the scar tissue of the patient resulted in pain relief. The mechanism responsible for this could be that dry needling can reduce peripheral and central sensitization. Noxious input from muscles is particularly effective in inducing neuroplastic changes in the spinal dorsal horn and likely in the brainstem. Dry needling may be instrumental in reversing such neuroplastic changes by removing a constant and intense nociceptive source.

Conclusion

This case report describes the successful management of a patient with post-scar neuralgia using dry needling, when all other treatment options were not producing pain relief. It is suggested that dry needling can be considered as an effective treatment option.

References

1. Speed CA. Injection therapies for soft-tissue disorders. Best Pract Res Clin Rheumatol 2003;17(1):167–181. DOI: 10.1016/S1521-6942(02)00122-5.
2. Speed CA. Injection therapies for soft-tissue lesions. Best Pract Res Clin Rheumatol 2007;21(2):333–347. DOI: 10.1016/j.berh.2006.11.001.
3. Casaneuva B, Rivas P, et al. Short-term improvement following dry needle stimulation of tender points in fibromyalgia. Rheumatol Int Apr 23, 2013.
4. Manheimer E, White A, et al. Metaanalysis: acupuncture for low back pain. Ann Intern Med 2005;142(8):651–663. DOI: 10.7326/0003-4819-142-8-200504190-00014.
5. Gunn CC, Millbrandt WE, et al. Dry needling of muscle motor points for chronic low-back pain: a randomized clinical trial with long-term follow-up. Spine (Phila Pa 1976) 1980;5(3):279–291. DOI: 10.1097/00000763-198005000-00011.
6. Lewit K. The needle effect in the relief of myofascial pain. Pain 1979;6(1):83–90. DOI: 10.1016/0304-3959(79)90142-8.
7. Neal BS, Longbottom J. Is there a role for acupuncture in the treatment of tendinopathy? Acupunct Med 2012;30(4):346–349. DOI: 10.1136/acupmed-2012-010208.
8. APTA. Physical therapists & the performance of dry needling: an educational resource paper. Alexandria, VA, USA: APTA Department of Practice and APTA State Government Affairs; 2012.
9. NCBPTE. Position statement: intramuscular manual therapy (dry needling). North Carolina Board of Physical Therapy Examiners, June 14, 2012.
10. MSSBPT. Intramuscular manual therapy (dry needling) may be performed by a licensed physical therapist. Mississippi State Board of Physical Therapy, Part 3101 Rule 1.3c, September 10, 2012.
11. LAPTB. Louisiana Physical Therapy Practice Act: Treatment with Dry Needling. Louisiana Physical Therapy Board, Rule 311, Page 29, October 20, 2011.
12. NEBPT. Minutes of the board of physical therapy: discussion of board opinions. Nebraska Board of Physical Therapy, June 20, 2011:1–4.
13. SPTB. Requirements for physical therapists to perform dry needling. Colorado Department of Regulatory Agencies: State Physical Therapy Board, Rule 211, 2008:10–11.
14. MelzacK R, Stillwell DM, et al. Trigger points and acupuncture points for pain: correlations and implications. Pain 1977;3(1):3–23. DOI: 10.1016/0304-3959(77)90032-X.
15. Ivins GK. Meralgia paresthetica, the elusive diagnosis: clinical experience with 14 adult patients. Ann Surg 2000;232(2):281–286. DOI: 10.1097/00000658-200008000-00019.
16. Standingr S Gray’s Anatomy: The Anatomical Basis of Clinical Practice. Churchill Livingstone/Elsevier; 2008.
17. Uzel M, Akkin SM, et al. Relationships of the lateral femoral cutaneous nerve to bony landmarks. Clin Orthop Relat Res 2011;469(9):2605–2611. DOI: 10.1007/s11999-011-1858-2.
18. Hsieh YL, Kao MJ, et al. Dry needling to a key myofascial trigger point may reduce the irritability of satellite MTrPs. Am J Phys Med Rehabil 2007;86(5):397–403. DOI: 10.1097/PHM.0b013e31804a554d.
19. Aronon JK. Changing beta-blockers in heart failure: when is a class not a class? The British Journal of General Practice 2008;58(551): 387–389. DOI: 10.3399/bjgp08X299317, PMC 2418988.
20. Khosrawi S, Moghtaderi A, et al. Acupuncture in treatment of carpal tunnel syndrome: a randomized controlled trial study. J Res Med Sci 2012;17(1):1–7.
21. Kumnerddee W, Kaewtong A. Efficacy of acupuncture versus night splinting for carpal tunnel syndrome: a randomized clinical trial. J Med Assoc Thai 2010;93(12):1463–1469.
22. Hsieh JC, Tu CH, et al. Activation of the hypothalamus characterizes the acupuncture stimulation at the analgesic point in human: a positron emission tomography study. Neurosci Lett 2001;307(2): 105–108. DOI: 10.1016/S0304-3940(01)01952-8.
23. Hui KK, Liu J, et al. Acupuncture modulates the limbic system and subcortical gray structures of the human brain: evidence from fMRI studies in normal subjects. Hum Brain Mapp 2000;9(1):13–25. DOI: 10.1002/1097-0193(2000)9<13::AID-HBM2>3.0.CO;2-F.
24. Yang CP, Hsieh CL, et al. Acupuncture in patients with carpal tunnel syndrome: a randomized controlled trial. Clin J Pain 2009;25(4): 327–333. DOI: 10.1097/AJP.0b013e318190511c.
25. Almeida RT, Duarte ID. Nitric oxide/cGMP pathway mediates orofacial antinociception induced by electroacupuncture at the ST36 acupoint. Brain Res 2008;1188:54–60. DOI: 10.1016/j.brainres.2007.10.060.
26. Kubo K, Yajima H, et al. Effects of acupuncture and heating on blood volume and oxygen saturation of human Achilles tendon in vivo. Eur J Appl Physiol 2010;109(3):545–550. DOI: 10.1007/s00421-010-1368-z.
27. Affaitati G, Costantini R, et al. Effects of treatment of peripheral pain generators in fibromyalgia patients. Eur J Pain 2011;15:61–69. DOI: 10.1016/j.ejpain.2010.09.002.
28. Larsson R, Oberg PA, et al. Changes of trapezius muscle blood flow and electromyography in chronic neck pain due to trapezius myalgia. Pain 1999;79(1):45–50. DOI: 10.1016/S0304-3959(98)00144-4.
29. Wall PD, Woolf CJ. Muscle but not cutaneous C-afferent input produces prolonged increases in the excitability of the flexion reflex in the rat. J Physiol 1984;356:443–458. DOI: 10.1113/jphysiol.1984.sp015475.
30. Sessle BJ, Hu JW, et al. Brainstem mechanisms underlying temporomandibular joint and masticatory muscle pain. J Musculoskeletal Pain 1999;7:161–169. DOI: 10.1300/J094v07n01_15.