Injections for Chronic Pain

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KEYWORDS

• Chronic pain • Regenerative injections • Trigger point injections • Botulinum toxins

KEY POINTS

- Even in the setting of chronic pain, various injections can still have a useful role in facilitating a rehabilitation program.
- Spinal injections, such as epidural steroid injections and facet joint injections, are among the most commonly used procedures in most pain practices; but a growing number of practices are considering less common injections, such as trigger point injections, regenerative injections/prolotherapy, and injections using botulinum toxins.

INTRODUCTION

Although interventional procedures should be used cautiously in the setting of chronic pain, there is a role for a variety of injections to facilitate patients' overall rehabilitation program. There are many resources available, including a prior edition of *Physical Medicine and Rehabilitation Clinics of North America*, which discuss the more conventional spinal injections. The focus of this article is on lesser-known injection options for treating chronic pain. The authors separately discuss trigger point injections (TPIs), regenerative injections (prolotherapy), and injections using botulinum toxins (BTx).

TRIGGER POINT INJECTIONS

Myofascial pain syndrome (MPS) is a common musculoskeletal pain syndrome characterized by a myofascial trigger point (MTrP) at muscle, fascia, or tendinous insertions. A MTrP is a hyperirritable tender spot, frequently associated with taut band that, on palpation, is firmer in consistency than adjacent muscle fibers. When compressed, an MTrP may cause patient vocalization or a visible withdrawal (which is known as the jump sign).

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Stretching and exercise are the foundation of treatment and management of MPS; however, for refractory cases, needle therapy may be offered. This therapy may include TPIs (using local anesthetics, corticosteroids, and/or BTx), dry needling (DN) (intramuscular stimulation [IMS]), and acupuncture.

Local Anesthetics

Despite the popularity of TPIs, there is no conclusive evidence that demonstrates superior effectiveness of TPIs over DN in the treatment of MPS.[1,2] One systematic review of randomized controlled trials found that direct injection to MTrPs was indeed effective but that the nature of the injected substance did not influence the outcome; hence, the investigators concluded that the beneficial effects of TPIs were likely the result of needle insertion or placebo.[1] However, another review showed short-term benefits of TPIs with lidocaine that were superior to DN or placebo.[3] It is conceivable that local pain and soreness associated with needling can be ameliorated with local anesthetic injection.[2]

Corticosteroids

Although inflammation may play a role in MPS, there is no evidence that the injection of corticosteroid provides any enhanced benefits.[4] In addition, corticosteroids carry the risk of local muscle necrosis and adrenal suppression. Thus, the use of corticosteroids for TPIs is not recommended.

Botulinum Toxin

Botulinum toxin (BTx) is a potent neurotoxin produced by the bacterium *Clostridium botulinum* that blocks acetylcholine release into the neuromuscular junction, leading to prolonged muscle relaxation (typically lasting 3 to 4 months). BTx is used for a variety of pain procedures as discussed separately in this article later. Briefly, the authors discuss the use of BTx in TPIs.

In TPIs, BTx is thought to reduce muscular ischemia and free entrapped nerve endings. Central and peripheral antinociceptive properties of BTx have also been postulated. Despite these mechanisms that could theoretically offer a benefit for patients with MPS, the use of BTx injections for myofascial trigger points is controversial. Meta-analyses of randomized trials in patients with neck pain have found no benefit of BTx intramuscular injections in the short-term (4 weeks) or long-term (6 months) when compared with placebo.[5,6] Although a recent review[7] showed inconclusive evidence regarding the effectiveness of BTx in the treatment of MPS, an older Cochrane review found moderate evidence that BTx injections are *not* effective.[3] In sum, given the high cost of the medication and questionable evidence for its efficacy, cost and clinical value should be carefully assessed before considering BTx injections for MPS.

Dry Needling

Dry needling (DN) (also known as intramuscular stimulation [IMS]) involves the practice of using a small-gauge needle (sometimes acupuncture needles) to irritate the MTrP without injecting any substance (as opposed to those discussed earlier). Systemic reviews and meta-analyses of randomized controlled trials suggest that DN is an effective therapy for MPS.[1,8,9] If DN is used to specifically target MTrPs, it is most effective when a local twitch response (LTR) (brisk contraction of the taut band) is elicited.[10] A fast-in-fast-out technique has been advocated to elicit a maximal number of LTRs. The needle penetrates the taut band of the muscle, is withdrawn to superficial subcutaneous tissue, then redirected to another area in proximity (**Fig. 1**). Deep DN to the