

Myofascial Trigger Points

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fact that it is remote from its source of origin. This referred pain rarely coincides with dermatologic or neuronal distributions, but follows a consistent pattern [5].

Etiology

Trigger points may develop after an initial injury to muscle fibers. This injury may include a noticeable traumatic event or repetitive microtrauma to the muscles. The trigger point causes pain and stress in the muscle or muscle fiber. As the stress increases, the muscles become fatigued and more susceptible to activation of additional trigger points. When predisposing factors combine with a triggering stress event, activation of a trigger point occurs. This theory is known as the injury pool theory [1].

Pathophysiology

There is no pathologic or laboratory test for identifying trigger points. Therefore, much of the pathophysiologic research on trigger points has been directed toward verifying common theories of their formation. Fig. 1 provides an example of the theory behind the formation of myofascial trigger points.

The local twitch response (LTR) has been described as a characteristic response of myofascial trigger points. LTR is a brisk contraction of the muscle fibers in and around the taut band elicited by snapping palpation or rapid

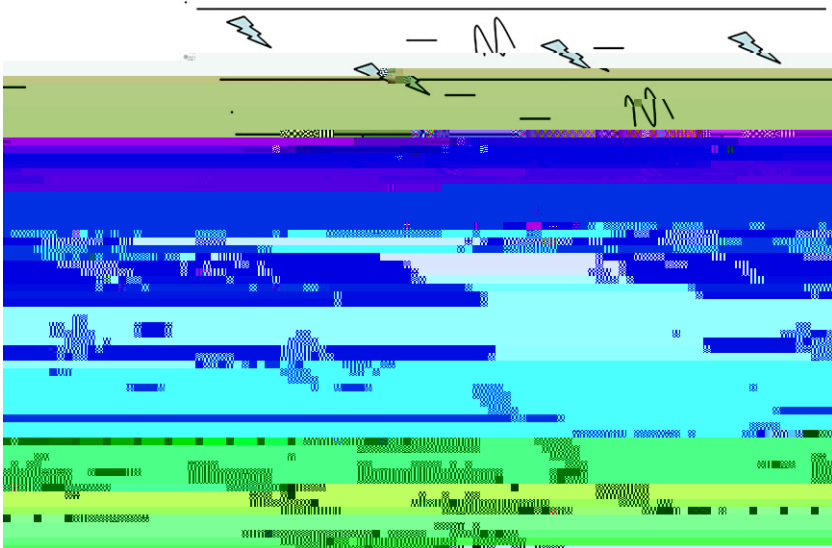


Fig. 1. Myofascial trigger point loci.

insertion of a needle into the myofascial trigger point[6]. The sensitive site where an LTR is found has been termed the ••sensitive locus.•• Based on observations during successful trigger point injections, a model with multiple

“bers. This process is repeated with the skin pushed to the other side. A taut band may be felt passing under the physician’s “nger. Snapping palpation,

1.

Onset description and immediate cause of the pain

Pain distribution pattern

Restricted range of motion with increased sensitivity to stretching

Weakened muscle due to pain with no muscular atrophy

Compression causing pain similar to the patient's chief complaint

A palpable taut band of muscle correlating with the patient's trigger point

LTR elicited by snapping palpation or rapid insertion of a needle

Reproduction of the referred pain with mechanical stimulation of the trigger point

and evenly until the patient reports discomfort. The pressure measurement is then recorded. Contralateral pressure measurements are taken to establish relative sensitivity of the point in question; a difference of 2 kg/cm² is considered an abnormal reading[14]. An electromyogram (EMG) also may assist in the diagnosis of the trigger point[15,16] When the active locus is entered, the peak amplitudes often are on the scale of the EMG monitor. Although this method may seem to be useful scientifically, significant clinical results have not been found.

Noninvasive techniques for management

Spray (freeze) and stretch

Travell and Simons[1] advocated passive stretching of the affected muscle after application of sprayed vapocoolant to be the single most effective



Fig. 3. Trigger points and their reference zones.

treatment for trigger point pain. The proper technique depends on patient education, cooperation, compliance, and preparation. The patient should be positioned comfortably, ensuring that the trigger point area is well supported and under minimal tension. Position should place one end of the muscle with the trigger point zone securely anchored. The patient should be marked after careful diagnosis of the trigger point region, and the reference zone should be noted. The skin overlying the trigger point should be anesthetized with a vapocoolant spray (ethyl chloride or dichlorodifluoromethane-trichloromonomethane) over the entire length of the muscle [12]. This spray should be applied from the trigger point toward the reference zone until the entire length of the muscle has been covered. The vapocoolant should be directed at a 30° angle to the skin. Immediately after the first vapocoolant spray pass, passive pressure should be applied to the other end of the muscle, resulting in a stretch. Multiple slow passes of spray over the entire width of the muscle should be performed while maintaining the passive muscle stretch. This procedure is repeated until full range of motion of the muscle group is reached, with a maximum of three repetitions before rewarming the area with moist heat. Care must be taken to avoid prolonged exposure to the vapocoolant spray, assuring that each spray pass lasts less than 6 seconds. Patients must be warned not to overstretch muscles after a therapy session.

Physical therapy

Some of the best measures to relieve cyclic myofascial pain involve the identification of perpetuating factors. Physical therapists assist patients in the determination of predisposing activities. With routine follow-up, they are often able to correct elements of poor posture and body mechanics [6].

Transcutaneous electrical stimulation

fast-out technique should be used to elicit an LTR. This local twitch was shown to predict the effectiveness of the trigger point injection [19]. After entering the trigger point, the needle should be aspirated to ensure that the lumen of a local blood vessel has not been violated. If the physician chooses to inject an agent, a small volume should be injected at this time. The needle may be withdrawn to the level of the skin without exiting, and it should be redirected to the trigger point repeating the process. The process of entering the trigger point and eliciting LTRs should proceed, attempting to contact as many sensitive loci as possible (Fig. 4).

An integral part of trigger point therapy is postprocedural stretching. After trigger point injection, the muscle group that was injected should undergo a full active stretch.

Complications of trigger point injections

As with the introduction of any foreign body through the skin, the risk for skin or soft tissue infection is a possibility. Injection over an area of infected skin is contraindicated. The physician should never aim the needle at an intercostal space to avoid the complication of a pneumothorax. Hematoma formation following a trigger point injection can be minimized with proper injection technique and holding pressure over the surrounding soft tissue after withdrawal of the needle [12,20].

Medications for injection

Local anesthetics

Local anesthetics are the substances that have been investigated most

injections were shown to improve measures on a pain scale, range of motion,

invasive and noninvasive, have been recognized for myofascial trigger points.

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