

Myofascial Trigger Points: An Overview – Evan Fryer

In today's society, many people are unaware of the repercussions associated with strenuous physical activity. Just because there is no immediate sign of injury through pain, doesn't mean that muscle damage is nonexistent. Unlike breaking a bone or tearing a ligament, affliction in skeletal muscle is not instantaneous. The anatomical basis of this pain is a series of nodules in taut bands of muscle fibers called Myofascial Trigger Points.

These trigger points are distributed in a nonuniform manner throughout the body and are activated by a number of different factors. Although psychological stress, smoking, and homeostatic imbalances contribute to the development of trigger points, the predominant cause of these nodules is skeletal muscle overload (Gerwin, 2008). There is evidence to suggest that when sarcomeres eccentrically contract past their normal limit, there is an excessive release of Acetylcholine (Dommerholt, Bron, & Franssen, 2006). This release stimulates sodium channels in the sarcoplasmic reticulum and increases calcium levels within muscle cells that trigger sustained muscle contractures. As this happens, "myosin filaments literally get stuck in the Z-band of the sarcomere" (Dommerholt et al., 2006, p. 211). Titin, which is also present in the Z-bands during sarcomere contraction, prevents the myosin filaments from detaching and therefore prevents the sarcomere from

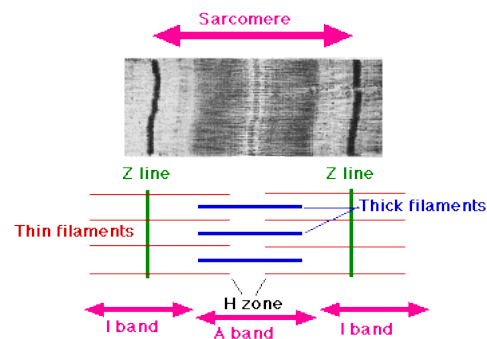


Figure 1 - Sarcomere in Skeletal Muscle

reestablishing its resting length (See Figure 1). The result is a “knot” in the skeletal muscle also known as a Myofascial Trigger Point that can be extremely painful when stretched or palpated. As muscles are stretched, muscle spindle fibers in the skeletal muscles send sensory information via sensory neurons to the Central Nervous System. However, when a muscle containing a trigger point complex contracts, there is an unordered alignment of the muscle spindle fibers and the muscular striations (Dommerholt et al., 2006). As a result, peripheral nociceptors are directly activated and pain is detected through the Somatic Nervous System pathway (See Figure 2).

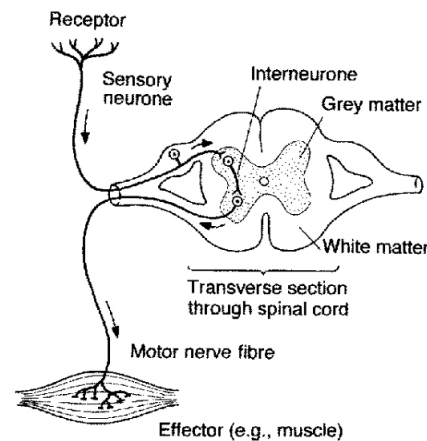


Figure 2 – Pathway of Somatic Nervous System

At this point, you may be wondering why this irritable and hypersensitive nodule is called a trigger point. The term “trigger point” comes from the fact that it *triggers* a pain pattern that can affect another region of the body (Gerwin, 2008). For

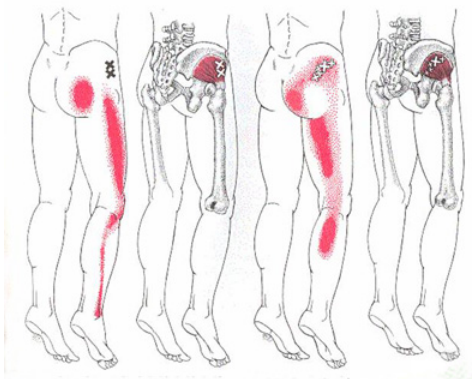


Figure 3 - Example of Pain Pattern Caused by Trigger Point

example, a trigger point in your lower trapezius muscle has the ability to cause pain in your levator scapulae muscle. There have even been cases where a trigger point in the gluteus medius muscle has caused pain in the foot of an individual (See Figure 3). Although

the degree of pain varies from person to person, each trigger point has its own specific pain pattern that remains consistent throughout the human race. In some cases, especially in chronic or long-term pain, Myofascial Trigger Points have caused severe headaches or migraines. Despite the level of severity, pain from these trigger points is most often dull, aching, and vaguely nauseating (Gerwin, 2008). In all cases, it is important to rid your body of Myofascial Trigger Points before there are further complications. Diagnosis of trigger points is fairly easy, as they can normally be detected by manual palpation. However, in some cases, the “hard ball”, or nodule, cannot be detected from touch; thus, there are a number of alternative methods. One method includes moving your fingers across your skin, transversely across the muscle striations. This can trigger a reflex arch, or twitch, in the skeletal muscle (Dommerholt et al., 2006). It has also been proven that Myofascial Trigger Points can be detected using heat technology as the areas around the trigger point complex have a greater temperature. In all cases, it is necessary to consult a physician if pain does not subside.

Once detected, there are a number of proven methods to eradicate Myofascial Trigger Points from your body. The most popular method -- and one of

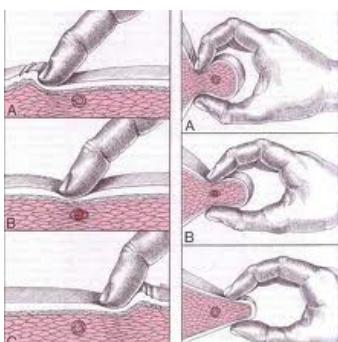


Figure 4 - Trigger Point Therapy (Manual Therapy)

the most basic -- is Manual Therapy (Dommerholt et al., 2006). This method involves deeply massaging the trigger point in order to loosen the “frozen” taut band in the muscle. Although this method can be painful, it is extremely useful in reorganizing the striations into a

uniform pattern and is relatively easy to perform by yourself (See Figure 4). Another method, which is highly debated among practitioners, is called Dry Needling, or Acupuncture (Dommerholt et al., 2006). In this method, solid needles are inserted directly into the Myofascial Trigger Points, which, if inserted correctly, will stimulate a local twitch response. To this date, there are no studies that prove the effectiveness and safeness of Dry Needling, and therefore, it is illegal in many countries.

Research involving Myofascial Trigger Points has only recently been performed and we are a ways away from a complete scientific explanation of these nodules. However, as we continue to strive for this better understanding, it is important to take care of our bodies by reducing musculoskeletal pain. Practicing safe physical activity and limiting overload on our skeletal muscles will surely prevent lifetime injury and unequivocally reduce the pain associated with Myofascial Trigger Points in our bodies.

References

- Dommerholt, J., Bron, C., & Franssen, J. (2006). Myofascial trigger points: An evidence-informed review. *Journal of Manual & Manipulative Therapy*, 14(4), 203-221. Available from <http://jmmtonline.com/>
- Gerwin, R. D. (2008). The taut band and other mysteries of the **trigger point**: An examination of the mechanisms relevant to the development and maintenance of the **trigger point**. *Journal of Musculoskeletal Pain*, 16(1), 115-121. doi:10.1080/10582450801960081