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Get To the Point

Considering myofascial trigger points can improve therapy outcomes

By Mary Biancalana, MS, CMTPT, LMT

If you ask someone on the street, he will probably know someone directly or indirectly who has had difficulty recovering from a minor surgical procedure or mild injury. The story repeats itself like this: The person went through what the physician said would be a simple and routine procedure. Rehab should only take a few weeks and after eight to 10 visits to physical therapy, the person would be as good as new.

However, life had another path for that person to follow. He's not achieving the expected strength goals at expected time intervals post-surgery. He's not achieving the expected range-of-motion goals at a reasonable time post-procedure. He's doing all his home exercises, pulling on variously colored rubber bands and stretching in all ways shown in the handouts, but still the area will not improve. The strength plateau leads to guarding and compensation with other

muscles. The range-of-motion deficits lead to postural changes and shifts in movement to accommodate the "new normal" range to complete ADLs — with difficulty.

Perhaps this isn't really a failed procedure or a malingering patient, but rather a person who has developed or activated already existing latent myofascial trigger points (TrPs). Those pesky trigger points may be the root cause of the lack of post-surgical progress. Understanding that myofascial trigger points can cause referred pain, weakness and loss of range of motion (myofascial dysfunction) can alter and improve the course of treatment for traditional physical therapy.

To Stretch or Not to Stretch

Much is now known about the pathological biochemistry of the trigger-point complex. There are at least 13 sensitizing substances found locally in the trigger point that are in much higher concentrations than the surrounding tissue (Shah et al., 2005). It's not known if each of these sensitizing substances is a good guy or bad guy. More information is forthcoming from many researchers, including Dr. Jay P. Shah and his colleagues at NIH.

These trigger points contain areas of densely compacted sarcomeres and the altered chemistry can change the ability of the muscle cell to fully contract and fully relax. When the sarcomeres are densely contracted within the trigger point, this leaves some of the sarcomeres overly stretched. Many thousands of myofibril bundles containing dysfunctional muscle cells are stuck in this biochemical feedback loop. It's not the tiny microscopic trigger points we're looking for and treating, rather the taut bands that develop that are palpable and made up of many dysfunctional muscle segments. Referred pain, loss of range of motion, and strength deficits develop when these segments go untreated.

Strength deficits may develop because a muscle cell that is already stuck in the contractile state cannot contract any further. The local energy crisis and biochemical changes that occur within the trigger-point complex perpetuate the muscular dysfunction. As for range-of-motion deficits, yes there is dysfunction in the primary muscle that was truly injured or traumatized, but often during the recovery stage, antagonistic muscles develop trigger-point dysfunction and aren't able to allow full stretch range. These antagonists can actually, due to the trigger-point dysfunction in their taut bands, contract on the passive short while we're attempting to stretch the opposing primary muscle, thereby restricting the intended movement.

Root Cause of the Problem

For instance, when a patient presents with restricted femoral external rotation after rehabbing a hip strain, it would make sense to work to increase the current external rotation. Considering the myofascial trigger point therapy model however, it may actually be the external rotators themselves contracting on the short, preventing further range gains. Trigger-point compression to deactivate the taut bands in these external rotators will be necessary to bring more normal stretch range to internal rotators in the area.

Weakness Caused by TrPs

How can considering the pseudo weakness caused by referred pain and myofascial dysfunction alter the course of treatment for traditional physical therapy practices?

When considering that physical therapists are held accountable for performance and ROM outcomes, uncovering anything that

can reduce those favorable outcomes is very important. If you don't consider the weakness and restriction in ROM caused by taut bands and TrPs, then it would appear the patient will be labeled a "failure" in physical therapy.

For example, after a supraspinatus tear repair and reattachment, the patient will be placed in an immobilizing sling for a certain amount of time. When physical therapy is started, abduction exercises are often prescribed. Since the arm has been passively held in one position for so long, there's bound to be weakness and some loss of range of motion due to the development of TrPs. Perhaps the loss of humeral abduction is not due just to weakness in the abductors themselves.

Instead, this could be due to trigger-point inhibition of the antagonists and other shoulder stabilizers, which are not able to fully stretch and relax to allow abduction. The latissimus dorsi, teres major and subscapularis need to be free of taut bands causing restriction, so as to allow scapular upward rotation and thereby humeral abduction.

So, Which Muscles Get Treated?

Knowing which muscles can refer to or cause weakness in a particular area can directly alter treatment interventions.

Often, treatments are directly applied to the area of pain. In both theory and practice, this seems like a perfectly good way to use time and resources. However, referred pain from trigger points in muscles far removed from the painful area could be the primary culprit. Knowing the referral patterns of muscles can greatly increase PT outcomes because intervention can be applied to the *source* of the pain, which could be seemingly unrelated to the actual location of pain.

For example, if a patient complains of lateral lower-leg pain and has an unstable ankle due to inhibition of the fibularis longus, ultrasound, heat or compression is usually applied to the lateral lower leg and not to the muscles in the hip or buttocks. Refer to the gluteus minimus illustration based on Drs. Travell and Simons to see how primary trigger points in the gluteus minimus can refer pain

to the lateral lower leg. This referral can also cause functional changes to all the muscles in the referral zone, including the fibularis longus. Drs. Travell and Simons and others have mapped pain-referral patterns across the entire body. Each area has listed the most probable muscles that could cause pain there.

Also consider the anterior shoulder. A patient can insistently complain of pain directly in the front of the left shoulder. Upon a visit to a physician, a DX of impingement syndrome is given and treatment of 8 to 10 sessions of physical therapy is suggested.

What if the physical therapist knew that the infraspinatus (in the posterior shoulder) was the most likely source of referred pain directly to the anterior shoulder? Upon further important investigation into the patient's sleep, working and living postures, it may also be discovered that the patient actually sleeps on his stomach with the left arm overhead and tucked under a pillow every night. Then the true root of the problem could be uncovered and remediation in sleep and work posture

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could begin immediately. Therapeutic interventions could be applied to the infraspinatus including trigger-point pressure release, dry needling, ultrasound and compression work through range of motion, even though that wasn't the site of the complaint of pain. The patient could also learn self-care techniques to apply compression to the infraspinatus to keep the trigger points deactivated. All this may not have been considered unless the Travell and Simons Trigger-Point Protocol was considered as part of an already excellent physical therapy practice model.

Treating Myofascial Trigger Points

There are many forms of treatment used to deactivate trigger points and restore full, pain-free range of motion. In-clinic dry needling, treatment with vapocoolants, as well as medical devices such as cold laser and acoustic shockwave compression can be used, in addition to manually applied trigger-point pressure release. To improve outcomes even more, a home self-care program should be taught to the patient. This home care program should emphasize applying trigger-point pressure release to replicate the clinical interventions. It's wise to have the patient passively apply pressure against gravity or against a self-care tool. Tennis balls, "s-curve" tools and an assortment of other small compression tools can be employed by the patient to restore local circulation, normalize contracted sarcomeres and reduce pain caused by myofascial TrPs.

We should be sure to ask about sleep, work and hobby postures that may be continuing to perpetuate the muscular dysfunction. Unidentified and untreated trigger points can be detrimental to clinical outcomes in rehabilitation. Knowing which muscles may be harboring them, restricting range of motion and reducing strength can improve clinical results. ■

Mary Biancalana is owner of Trigger Point Sports Performance and Muscle Health Inc., Chicago, IL. She is a board-certified myofascial trigger point therapist with more than 12 years of clinical experience working with people in chronic and acute pain due to myofascial dysfunction. She is also co-author of the book Trigger Point Therapy for Low Back Pain, (New Harbinger, 2010).

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which can make the search for a properly qualified instructor challenging. The best resource for finding a qualified instructor is the Pilates Method Alliance (PMA) website (www.pilatesmethodalliance.org).

PMA is the professional organization and certifying agency for the Pilates profession, establishing standards and promoting the Pilates method. Instructors are only able to say they are PMA-certified after completing the only psychometrically validated, third-party professional certification exam in the Pilates field.

Benefits for PTs and Patients

The growing popularity of Pilates has made it a common term in many fitness centers and rehabilitation facilities. PTs preferring an alternative approach to the diagnosis and treatment of injuries will enjoy using this holistic method to promote health and healing. Pilates is inherently integrative. Though it can address a variety of pathologies very specifically, the system consistently demands whole-body movement, awareness and connection. Such movement integration is not only an effective approach to local injury, it engages the patient's whole body and mind in the healing process.

This type of engagement can be both enjoyable and empowering, which increases the likelihood of completing a prescribed course of treatment and compliance with a home exercises program. PTs using Pilates have the benefit of giving their patients a system of movement that can be used and developed over a lifetime. ■

Mischa Decker, co-owner of InsideOut Body Therapies (0), earned a DPT from Duke University School of Medicine and a BS in exercise and sport sciences from the University of Florida. Decker is a PMA®-certified Pilates teacher trained at The Pilates Center of Boulder. She also completed The Pilates Center master's program and is a faculty member of The Pilates Center. She co-leads the InsideOut Body Therapies Pilates teacher training program and is director of the InsideOut Body Therapies Pilates-based physical therapy program.

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