

MYOFASCIAL DYSFUNCTION AND PELVIC PAIN

By John Jarrell, MD, MSc, FRCSC; and Magali Robert, MD, FRCSC

Pain originating in the muscles is very common. It has been estimated that approximately 20% of the population over 18 years of age will experience chronic and recurrent muscular pain. Chronic pain is the second most common complaint of patients seeking medical attention, following that of upper respiratory conditions. The presence of chronic pain can profoundly affect the lifestyle of an individual and be a serious contributor to restricted living, altered work habits and altered psychological capacity.

This article will focus on the contribution of pain derived from muscle sources in the pelvic region, as based upon a number of excellent summaries in the available literature.¹⁻³ It will examine the nature of the so-called trigger points, as well as their origin, physiology and clinical presentation. New information will also be presented, based on the close interactions between visceral disease and referred myofascial pain, as studied at the Chronic Pelvic Pain Centre in Calgary, Alberta.

In this article:

1. Myofascial dysfunction trigger points?
2. Diagnosis of pain.
3. Treatment of pain.
4. The relationship between pelvic pain and myofascial dysfunction.

WHAT ARE THE TRIGGER POINTS?

Pain originating from muscles has been studied principally in areas traditionally removed from the pelvis—commonly studied as part of orofacial pain syndromes, back disorders, and chronic neck pain and headache.

Trigger points are identified clinically. They are not a diagnosis in themselves, but require clinical review to place them in an appropriate

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Case 1

A 32-year-old female police officer presented with a history of left lower quadrant pain that had been present for several months and was of such severity that she was unable to wear her Sam Browne pistol belt. This led to her being placed on desk duty and consideration was made to put her on disability. There was no previous injury noted. The examination demonstrated a severely tender trigger point in the left lower quadrant that had all of the characteristics of a trigger point. The pelvic examination was normal, except for a slight fullness in the left adnexa that was not particularly tender. The patient underwent several dry needling injections, with benefits that lasted for several days, but the pain recurred each time after several weeks. A laparoscopic procedure was undertaken and an old hemorrhagic cyst removed from her left ovary. The remainder of the examination was normal. Post-operatively, the first trigger point was eliminated and a second was isolated to the left lower quadrant incision. This was resolved after two dry needle injections.

This case demonstrates how the presence of internal visceral disease can masquerade as a trigger point in the abdominal wall. Secondly, the treatment of the visceral disease is associated with improvement of the trigger point. Finally, some people may develop trigger points in close association with surgical scars.

context. This is particularly the case for pelvic pain, which is derived from various trigger points. A trigger point can be described as a small, circumscribed hyper-irritable focus in the muscles and fascia, usually associated with a firm or taut band of skeletal muscle.⁴ Trigger points are also seen in ligaments, tendons, joint capsules, skin, and periosteum.

Historically, they have been referred to as hardened muscle (Muskelharden), myogelosis (myogelosen), or myalgic spots.⁵ Later, Steidler referred to them as “trigger points.”⁶ Travell and Simons presented the definitive approach to these structures when they wrote the Trigger Point Manual.¹

Trigger points arise only in muscles that are

under stress. They do not occur in healthy muscles and all muscles have the capability of developing a trigger point. The recognised etiologic agents are injury-associated stress and tension.⁷ They are particularly vulnerable during periods of emotional stress. Furthermore, as they are commonly associated with the axial skeleton, trigger points are associated with altered posture and chronic stress that is induced by repetitive injury, such as holding a telephone to the ear with a shoulder, prolonged bending, and poor posture while sitting.

Additional causes have been noted to be poor conditioning due to immobilisation, athletic injury, joint malalignment, and scoliosis. Patients with poor and non-restorative sleep patterns seem

Dr. Jarrell is professor, department of obstetrics and gynecology, University of Calgary, Calgary, Alberta.

Dr. Robert is assistant clinical professor, department of obstetrics and gynecology, University of Calgary, Calgary, Alberta.

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Case 2

A 38-year-old woman presented with a history of six previous laparotomies for severe endometriosis. The patient had had a total abdominal hysterectomy and both tubes and ovaries removed. The pain was located in the right lower quadrant and she stated that pressure in this area commonly radiated into the right leg and into her vagina. She was incapable of having sexual intercourse. Examination of the abdomen revealed a dense, painful scar (3 cm²) in the region of the right side of the laparotomy incision, above the Pfannenstiel's incision. Pelvic examination was unremarkable, specifically, there were no tender areas involving the upper aspect of the vaginal vault.

The patient began a course of care in the Calgary Chronic Pain Clinic in which there is an emphasis on the self-management of pain, lectures concerning pain, physiotherapy, psychological counselling and medical therapy involving trigger point injections. In this patient's case, there was significant compliance with the self-management approach. In addition, injection of 10 cc 1% xylocaine into the area of the dense scar produced a severe pain that shot into the vaginal area and reproduced the pain during sexual intercourse. Over the course of management in the chronic pain clinic, and with six such injections, the patient recovered sexual function and remains pain-free.

This case indicates that myofascial pain may refer to non-characteristic areas. Furthermore, as the injections proceeded, it became apparent that what had appeared to be a severely scarred abdominal wall was, in fact, a series of tense muscles that became softened and mobile following the injections. A conventional bimanual examination would have failed to appreciate the abdominal wall contribution to her pain.



to be susceptible to the condition, as are patients with nutritional deficiencies and hormonal disturbances, such as hypothyroidism.

HOW ARE TRIGGER POINTS CLASSIFIED?

Active Trigger Points

These trigger points are always tender, painful and symptomatic. The pain may be present while at rest or when the muscle is engaged. The patient is commonly able to locate the site quite readily, and palpation confirms the nature of the patient's experience of pain. Pressure applied to the area results in a referral of the pain in a sometimes unusual pattern. Snapping of the

affected muscle is often associated with a twitch of the muscle or the skin, or both. There is usually a so-called "jump response" to a twitch or sudden pressure. The referral pattern of some trigger points is often characteristic.

Primary Trigger Points

These develop independently and are not the result of the function of a trigger point elsewhere.

Secondary Trigger Points

These trigger points develop in antagonistic muscles and neighbouring protective muscles as the result of stress and tension from the primary trigger point. They commonly become symptomatic after the treatment of the primary trigger point.

Case 3

A 43-year-old woman presented with a history of having 16 laparotomies for severe endometriosis, as well as a number of surgeries for bowel obstruction. The pains were severe on presentation and the trigger points could be readily mapped out on the abdomen, extending into the epigastrium. The pelvic examination was normal and there was no evidence of visceral disease in the pelvis. The patient began a self-management program, which provided significant benefits for her significant family stresses.

Initial injections of the abdomen were undertaken with dry needling techniques in conjunction with the self-management program offered at the centre. The patient readily responded to the needling such that over the

course of several weeks the tenderness was limited to the right lower quadrant. This trigger point was persistent. A referral has been made to a general surgeon as the right lower quadrant may be involved in an abdominal wall hernia.

This case indicates the nature of the capacity of trigger points to magnify from a primary site; in this case the right lower quadrant. These worsened in large measure due to the severe degree of personal stress. As these issues began to resolve, the patient noted an improvement in the trigger points that appeared to be out of relation to the usual response to a trigger point injection. It was likely the severe stress was maintaining or aggravating the secondary trigger points, as stress relief was associated with overall improvement. Lack of complete resolution again underscores the possibility that underlying visceral disease (*i.e.*, an abdominal hernia) may serve to instigate a trigger point.



Satellite Trigger Points

These develop in the area of referred pain and come about as a result of the persistent motor unit activity in the muscle. It is important to recognise that visceral disease can be the reason for the development of trigger points.^{7,8}

Latent Trigger Points

These trigger points do not produce pain unless activated and are often found coincidentally during examination. They are not a problem unless there is a change in the loading of the involved muscle while treating the active trig-



ger point. Although not usually a site of pain, latent trigger points can cause muscle weakness and shortening.

WHAT CAUSES TRIGGER POINTS?

Simons and Travell have consistently reported that the trigger points are an alteration in function and, therefore, do not develop until long periods of dysfunction.⁹ When this occurs, the affected muscles display swollen mitochondria, moth-eaten myofilaments, necrosis of the myofilaments,

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Case 4

This 38-year-old woman developed right lower quadrant pain following a vaginal hysterectomy. The patient had severe pain during intercourse and was incapable of vaginal penetration. Examination demonstrated a trigger point in the right side of the abdomen, as indicated. The patient also had a severely painful nodule at the upper end of the vagina. She declined formal self-management classes in group formats and, instead, accepted the one-on-one psychological approach to self-management.

The patient had had one laparoscopy for the removal of the nodularity of the upper vagina. At the chronic pain clinic, the patient underwent direct injections of the upper vagina on three occasions with 8 cc to 10 cc of 1% xylocaine with overall benefit. The patient noted an immediate improvement of pain that persisted for a number of months. Repeated injections over several months allowed the patient to resume painless intercourse. Of interest, the trigger point in the right lower quadrant disappeared after the vaginal injections and did not require direct abdominal injections.

This case indicates that improvement in the vaginal cuff with xylocaine may result in reduced pain. There does appear to be a relationship between the right lower quadrant trigger point and the vaginal pain. The satellite trigger point in the right lower quadrant spontaneously resolved with treatment of the vaginal cuff pain.

irregular sarcomeres and depletion of muscle glycogen.¹⁰

WHAT TRIGGERS A TRIGGER POINT?

The current theory that describes the development of a trigger point is based upon an originating injury or traumatic event. One such trigger may be the sustained muscle contraction or tension due to sustained ill posture. The event causes a disruption of the sarcoplasmic reticulum and the subsequent release of calcium.

In the presence of adenosine triphosphate (ATP), this results in sustained contraction of the myofilaments and an increase of metabolic activity. This, in turn, results in the releases of tissue factors of serotonin, prostaglandin, histamine, and kinins. These substances activate the nociceptor receptors and generate pain sensation along the type C nerve fibres. This creates the sensation of pain. The central nervous system (CNS) then stimulates motor end plates, inducing spasm and splinting. Thus, a cyclic

effect is created wherein the further release of calcium promotes further spasm and tension.

Simons and Travell describe an integrated hypothesis whereby there is an increase in acetylcholine at the neuromuscular endpoints, resulting in increased firing of the motor end plate and subsequent continuous low-amplitude action potentials accompanied by large amplitude spikes in the region.¹⁰ These sensitive areas are often in the vicinity of the affected muscle.

These findings are consistent with the histologic appearance of a muscle that is affected by a trigger point. A longitudinal biopsy will demonstrate a thickened portion of a muscle fibre (creating the nodule that is palpable) because the sarcomeres are maximally shortened at that location. This contraction is associated with the stretching of accompanying sarcomeres on either side and generates increased tension. This, in turn, increases the metabolic activity of the area.

The injury also acts through the CNS to effect even stronger contractions and greater pain, thereby setting up a cyclic effect.

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Case 5

A 32-year-old woman presented with severe pelvic pain such that sitting was not possible. She avoided voiding and defecation whenever possible, and was not sexually active because of the pain. In addition to having had several major procedures, she had experienced severe abuse in her childhood. Although not the cause of the chronic pain, it exacerbated the experience of her pain substantially. The patient was found clinically to have several severe trigger points in the lower abdominal wall and a significant tense band in the levator ani, pyramidalis, and obturator internus muscles. With extensive physiotherapy and the self-management program of the Calgary Chronic Pain Centre, significant benefit was achieved. The patient required several injections into the left pyramidalis. Additional injections of tight bands were undertaken into the levator muscles and obturator internus muscles with 5 cc to 10 cc of 1% xylocaine. These were most noticeable on the left side. The patient demonstrated significant improvement in the degree of disability; she was able to sit and walk with substantially improved ability.



This case demonstrates that, in the pelvis, severe spasm is not isolated to the abdominal wall, but often extends to the intra-pelvic musculature. Muscles that are commonly involved include the levator ani and obturator internus. The involvement of such muscles commonly causes severe pelvic spasm that results in urinary pain post-voiding, avoidance of micturition, and defecation, leading to marked alterations in the physiologic functions of the pelvic viscera.

HOW DO YOU DIAGNOSE?

The presence of a trigger point is recognised by the palpation of a tender tense nodule or band in the belly of a skeletal muscle. When palpated, usually with the pulp of a digit, a nodule has the characteristics of a small collection of subcutaneous fat, but is very tender and reproduces the patient's experience of pain. Additionally, the patient is aware of a characteristic radiation pattern of pain that may be in an apparently bizarre direction, such as from the right lower quadrant up into the chest or down into the vagina. A band palpated in the pelvic muscles commonly feels like a tight string-like area that reproduces the severe pain and often radiates up into the lower abdomen. The band commonly undergoes a twitch when plucked, although this is more characteristic of bands involving the back muscles.

WHAT IS THE TREATMENT?

Recommended treatment options include a number of therapeutic approaches, such as the avoidance of immobility, exercise, ice and heat, massage, ethyl chloride spray followed by muscle stretch, multidisciplinary care and trigger point injection.¹¹ In general, however, the use of injections—either with dry needling, usually with acupuncture needles, or with the actual injection of a local anesthetic into the trigger point—is recommended.

The area is somewhat controversial, with a recent systematic review indicating there was no evidence of confirmed effects of needling beyond that of placebo.¹² It is apparent, however, that there is considerable anecdotal evidence to the contrary. This is based on the premise that the needle can initiate a local contraction of the muscle fibre and result in a release of the trigger point.

Trigger point injections are best performed in combination with physiotherapy and self-directed stretching exercises. Trigger points are released by identification of the position by palpation. An acupuncture needle or 25-gauge needle is aimed at the trigger point. An increase in the resting tone is felt at the site, followed by a twitch response. After injection, the trigger point is no longer palpable. At the instant of release, the patient will experience significant, temporary recapitulation of pain, often with striking and unusual patterns of radiation.

Long-term success is more likely sustained if undertaken with comprehensive approaches that include the improvement of overall muscle strength, fitness, smoking cessation, reduction in personal stress, and the principles of moving from a pain-centred life to one in which pain is a part, but not a central part, of the patient's life. Thus, the approach used in the chronic pain clinic is one of rehabilitation. Emphasis is placed on achieving reasonable personal goals and obtaining an improved quality of life, while accepting that cure is not the goal.

The management of trigger points with botulinum toxin is generating increased interest.^{13,14} Botulinum toxin appears to provide an excellent approach to the condition by temporarily arresting the signal at the neuromuscular junction of skeletal muscle. Although recognised as a treatment for neck pain, it is gaining interest in the management of pelvic pain. Additional benefits have been identified for the management of headache.¹⁵⁻¹⁷ Despite these observations, it is apparent this is an area where an appropriate randomised trial should be undertaken.

Take-home message

This article reflects some of the difficulties associated with the diagnosis and management of pelvic pain. Myofascial trigger points and bands should be sought in the evaluation of patients presenting with chronic pelvic pain. Although awareness of trigger points is important, it is important to remember that these are secondary findings and, in themselves, do not represent a specific disease. They may arise from diverse causes, such as visceral disease, muscle fatigue, or skeletal disease.

The majority of the patients who have been reviewed with chronic trigger points appear to have active or treated internal visceral gynecologic disease. It remains important to appreciate that the primary cause of the trigger points may be visceral disease, so one must explore the possibility of visceral illness and not concentrate on simply injections for the management of the trigger points. Specific treatment of trigger points, however, can dramatically improve pain symptoms and improve overall management.

Finally, further understanding of the role of trigger points in pelvic pain is required and can be gleaned from randomised clinical trials.

PELVIC PAIN AND MYOFASCIAL DYSFUNCTION

The description of pelvic pain in relation to myofascial dysfunction has been initially described by Slocumb.¹⁸ Most of the available literature on pelvic pain, however, has concentrated on visceral causes of pain due to endometriosis, chronic pelvic inflammatory disease and adhesions. These conditions are well-known and have been summarised in a number of clinical reviews. Most interesting, however, is the relatively consistent observation

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that up to 40% of subjects undergoing operative laparoscopy for the diagnosis of pelvic pain have no observed disease. We also know that treated pelvic disease may still result in ongoing pain.

This brings up the possibility of myofascial pain referring to the pelvis and its role in chronic pelvic pain. It is possible that the presence of a myofascial disturbance in the abdominal wall may be due to a myofascial dysfunction, with or without visceral disease. This is interesting because myofascial dysfunction is not generally considered a part of the entire pattern of the constellation of pain.

For the purposes of this article, the pattern of clinical presentation was reviewed from among a series of private patients and some patients referred to the Calgary Chronic Pain Centre. In each case, the apparent trigger points were identified by the clinical appearance of localised pain that was associated with a small nodule. This caused a pain similar to the patient's complaint when compressed and the pain referred to another location with this compression. A brief history follows in each case. The individual trigger points have been identified by marks based upon the above criteria for recognition. [CME](#)

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