

Brown Bag Lecture Univ. California Medical Center San Francisco (March 2001)
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Pelvic Pain

I plan to discuss myofascial pelvic pain, but the first step is to go back and look at the broader implications of pelvic pain.

The widespread effect that pelvic pain syndrome can have on the body and mind, may make it different than pain anywhere else. The uniqueness of the pelvis was contemplated thousands of years ago by Chinese and East Indian healers, philosophers and teachers.

In 2600BC, the Nei Jing, which was the bible of traditional Chinese medicine, identified the Dan Tien (an area in the central pelvis, 2 1/2 FB below the umbilicus) as the energetic center of the body.

They site that just as heaven was a point of origin or energetic center, which they refer to as “The Great One” so does the body have a root and origin of all of its energetic systems, which is the Dan Tien. (Macrocosm/Microcosm)

This point functions to “step down” the energies of the universe in order to transform them into energies that can be used in procreation, nutrition, protection and general energies when there is a disturbance in the Tan Tien, the normal energy flow required to maintain these functions is lost.

The Indian Yogis believed that the pelvis, representing the lowest of the Chakras (or energy vortices) was the one that connected with the earth energy and directed this energy upward. This is similar to the Dan Tien's connection to the universe. An uninterrupted transmission gave health, balance and enlightenment.

The Japanese call the center of power within the pelvis, the Hara. It was the center from which all movement originated, and the body's center of gravity. For centuries the warriors of the East have developed martial arts, centering on disciplines to focus or concentrate energy in the Hara. They would then use this energy as a source to draw upon in combat.

With this somewhat esoteric background in mind, one might begin to understand how pelvic floor myofascial dysfunction: trigger points and hypertonus can be responsible for a multitude of pain syndromes, lower urinary tract symptoms, and anxiety and depression states. These complaints cross many medical specialties and include suprapubic, perineal, sacral, coccygeal, low back, urethral, vaginal, anal and ejaculatory pain or the symptom/disease entities of urinary urgency/frequency (urethral syndrome), prostatodynia, Interstitial cystitis and vulvodynia.

The amazing thing is that the underlying myofascial cause is frequently not considered. Perhaps Travel and Simons in their classic text should re-title the chapter on the pelvic floor muscles from “Pain in the Rear” to that used for the iliopsoas muscle chapter “Hidden Prankster.”

There may be several reasons why physicians fail to recognize this entity:

1. Lack of medical school training in myofascial pain. In fact, there has been a movement on the part of physicians working with myofascial pain to introduce such training into medical school curriculum.
2. The sensory nerve pathway of deep muscles is projected via the more primitive paleospino thalamic tract, which goes to the medial thalamus. It is this region that contributes to the behavioral aspects of pain (emotions) vs. the discriminatory localizing aspect which terminates in the somatosensory cortex (neospinothalamic tract) – (skin sensation)
3. The detection difficulty arises because of the unique interface of the silent pelvic floor muscles with visceral structures that penetrate them. Therefore, when the pelvic floor muscles become hypertonic, or develop spasm, the visceral structures, i.e. the urethra, vagina and rectum are compressed. The result is that these poorly localized, somewhat silent muscles cause symptoms in the penetrating viscera. Because of the connections to the limbic structures representing the emotional aspects of pain, patients become

agitated, anxious, tearful and complain of symptoms in the urethra, vagina, rectum or pain in the surrounding pelvic muscles or back.

The patients seek help from primary care physicians, urologists, gynecologists and proctologists. These physicians are confronted by very emotional patients, which no doubt enters into the treatment equation.

Since the symptoms sound like a bladder infection/prostatitis (even though tests are negative), patients are treated with multiple courses of antibiotics, urethral dilations in women and occasionally surgery (TUR prostate in men). When there is no response, they go to the next physician or are sent for psychotherapy. (TURP, Sacral Wires)

Since the vaginal pain and dyspareunia sounds like a yeast infection, endometriosis or vulvar vestibulitis, they are treated with many courses of antifungal agents (sensitized to topicals), dietary changes, vestibular or laparoscopic surgery.

On the other hand, proctologists seem to recognize levator ani syndrome more than other specialists do and are more inclined to recommend muscle relaxing modalities; after doing their work

In other words, these specialists are not seeing the forest (muscles) for the trees (organs).

I have even observed that myofascial pain outside of the pelvis is not recognized by orthopedists. I have seen many patients with back pain who tell me their doctor can not understand what is wrong since the x-ray of their back is normal. This attitude harkins back to the pre-Travell days, when the attitude was that if the problem couldn't be seen on x-ray, the patient was referred to a psychiatrist.

I would like to take you on a short journey to the understanding of pelvic floor myofascial pain. Why the pelvis is so vulnerable? What are the causes? And, how is it treated?

To begin, let us review some of the basic pelvic floor anatomy.

It can be divided into the:

pelvic floor: levator muscles
pubococcygeus
iliococcygeus
coccygeus
piriformis
sidewalls: obturator internus (Discuss pudendal nerve entrapment)
perineum: urogenital triangle
urogenital diaphragm
isohocavernosus
bulbocavenosus
transverse perineal
perineal body
external anal sphincter

Since trigger points are the root of myofascial pelvic pain syndromes, let us review the nature and development of these trigger points, especially as they pertain to the pelvic floor muscles.

What are myofascial trigger points and how do they develop?

A myofascial trigger point (definition quoted from Travel and Simon's Trigger Point Manual) "is a hyper-irritable spot, usually within a taut band of skeletal muscle or in the muscle fascia that is painful on compression and that can give rise to characteristic referred pain, tenderness and autonomic phenomena." It is actually the end result of a muscle that is injured by acute, repetitive or sustained overloading.

According to David Simon, the injury occurs at the motor end plate. He believes that the muscle damage sets off a self-sustaining pathophysiological reaction revolving around the increase in acetylcholine release from the motor end plate, calcium loss from the injured sarcomere, muscle fiber contraction and ischemia. The ischemia creates an energy crisis with an inability to recapture the calcium; thus perpetuating the process. It can be detected electromyographically

(Hubbard), as well as microscopically in the form of contraction knots. (contribute to taut band and ischemia)

(Stretching helps eradicate and reset the trigger points and contraction knots)

This process sensitizes C-fibers, which can establish another self-sustaining cycle of increased muscle tension, in this case by nerve reflexes.

This tender point can then refer pain along that, surrounding or distant muscle; set off autonomic nervous system symptoms in the reference zone (vascular or dysasthesia) weaken the muscles so that they cannot accomplish a full range of motion, increase their sensitivity and create other trigger points. The tender muscle and fascia contract as a reaction to the pain, thereby establishing a shortened position. This process can cause surrounding muscle groups to compensate for weakness or distortion, work harder and thereby spread the process by themselves developing trigger points. This results in increased stress and depression, which increase nerve sensitivity and muscle tension. Thereby, initiating a downward spiral of symptoms.

When we apply these concepts to the pelvic floor, we begin to understand its uniqueness and increased vulnerability to injury.

Reasons:

1.) location

2.) muscle characteristics

3.) work schedule

4.) response to stress

Part of this uniqueness can be attributed to its location, i.e. the anatomic center of the body. In this position it can readily influence and be influenced by the upper and lower since it serves as an attachment of trunk and lower body extremity muscles, links the vertebral column to the lower extremities and transmits forces between the trunk and legs.

Another characteristic of the pelvic floor muscles is their eccentric contraction. This means that the contraction is a lengthening one, whereby the external forces acting on the muscle are greater than those produced by the muscle itself. (like a rubber band) An example of an eccentric contraction is the activity of the quadriceps (extensor) muscles of the leg when walking down stairs or lengthening of the pelvic floor with increased intra-abdominal pressure.

These muscles are more easily damaged because during this negative work, a smaller number of motor units are active than during positive work of the same intensity. Therefore, mechanical stress to the Z bands and connective tissue is

higher. Histological studies confirm that muscle damage is greater after eccentric than concentric (shortening) contractions (intense).

In addition to its location and contraction characteristics, a major cause of its vulnerability is its work ethic, i.e. constant activity. They seem to be the hardest working muscles in the body. Not only are they in action 24 hours a day serving supportive, sphincteric and sexual functions, but they are a major target of stress, both throughout life and in the early years during psychosexual development.

In order to support the internal organs, the slow twitch fibers provide a constant tonic contraction and the fast twitch fibers must contract instantly to compensate for any sudden increase in intra-abdominal pressure brought on by mechanical stress (coughing, sneezing or lifting). The vigilance continues even in the sleep state as the sphincteric tone increases in response to bladder and rectal filling.

In addition, during REM sleep, men attain 4-5 physiologic erections, that require contraction of the bulbocavernosus and ischiocavernosus muscles. These same muscles, along with others in the pelvic floor contract rapidly with orgasm in both men and women.

To visualize how the pelvic floor responds to stress, one need only to look at the movement of a dog's tail, to see that it mirrors the emotions. When the dog is happy, the tail wags loosely from side to side. When the animal is stressed, it pulls the tail tightly under the legs. It is the pelvic floor muscles that control the tail, in fact. The pelvic floor muscles were also the tail wagers in man before the evolutionary loss of the tail and upright position made them supporting muscles.

Yet the pelvic floor muscles are still attached to the rudimentary tail, the coccyx, which is pulled forward when contracted by stress (compressing its penetrating organs). Therefore, man's pelvic muscles, as the dog's, may be the ultimate representation of the mind-body connection, for they are constantly responding to fluctuations in feelings. Think of the connotation in the terms "He left with his tail between his legs" and "He has a tight sphincter." It indicates the pelvic floor's emotional response to defeat or personality types.

Because of many demands placed on these multi-functional muscles, they may become overloaded, sustain injury and develop self-sustaining dysfunctional patterns.

The most common events that lead to injury are:

- 1.) Chronic tension holding patterns that may go back to childhood and develop from sexual abuse, traumatic toilet training, abnormal bowel patterns, guilt surrounding sexual feelings, dance training or stress. (monster in bathroom).
- 2.) Repetitive minor trauma or straining with constipation or urinary obstruction.
- 3.) A sudden brief, severe strain from sports, dance or gymnastic accident or fall.
- 4.) A direct physical trauma from bicycling, childbirth, urologic or gynecologic instrumentation or surgery.
- 5.) Inflammation of pelvic organs, such as prostatitis, cystitis, urethritis, gynecologic inflammation, vaginitis, proctitis or anal fissures.
- 6.) Referred pain from other attaching muscle groups or viscera. (i.e. endometriosis-viscero-somatic reflex)

The intensity of the force required to create injury is dependent on the baseline muscle integrity. Therefore, those with weakened muscles from underlying pathology will sustain injuries more easily. Common predisposing biomechanical problems that create pelvic muscle imbalance are skeletal deformities (scoliosis), articular dysfunction of the back, hips or SI joint, systemic factors from hormonal (thyroid, nutritional (Iron, B vitamins) or genetic sources.

Depending on the severity of the myofascial injury, a trigger point can be latent or asymptomatic, unless touched, or it can be active and symptomatic. The confusing aspect to the development of a symptomatic, active trigger point is that

the traumas that lead to it may be additive and only give symptoms when a final event “summates” to exceed a threshold in the muscle. Sometime the final triggering event or “straw that broke the camel’s back” can be such a minor “straw” that it is not considered as a cause. This concept can be better understood by giving an example:

A common scenario begins with childhood sexual abuse, which results in tightening of the pelvic floor muscles, both as a response to pain and as a defense mechanism. This increased muscle tension can disappear or develop into a latent asymptomatic trigger point. In the latter case, later in life, minor muscle tension from vaginitis, cystitis, pelvic surgery, athletic injuries or emotional distress may push the muscle beyond their threshold and cause this latent point to become symptomatic (active).

Symptoms caused by specific muscles

HISTORICAL REVIEW OF PELVIC FLOOR THERAPY

There are many references in the literature that cite the benefit of manual therapy of the pelvic floor for painful pelvic conditions. In 1838, Joseph Claude Recamier described intrapelvic manual therapy techniques of stretching, massage and rhythmic percussion for the successful treatment of anal and uterine pain.

Further advances did not come quickly because of the apparent complexity of the pelvic floor muscles. In 1889, Dickinson wrote that “there was no muscle in the body whose form and function is more difficult to understand than the levator ani.”

It was not until 1937, when G H Thiele first noted that the pelvic floor muscles could cause pain in the coccyx that this concept began to expand. He was able to relieve symptoms by a stripping massage of the levators, coccygeus and piriformis muscles. (Thiele’s Massage)

In 1954, Thiele pointed out that the symptoms we now associate with vulvodynia and prostatodynia could be the result of levator ani spasm. He found the perineal discomfort unrelieved with urologic treatment could respond to levator massage and suggested that “aching urethral and vaginal pain during urination could be a form of levator spasm.”

Thiele later described myofascial release and soft tissue mobilization techniques for vulvodynia. “Recently, I attended a patient for whom sexual intercourse had been intolerable for 5 years. Complete relief of all pain and tenderness was accomplished by a series of 12 massages over a period of three weeks.”

In 1977, Sinaki et al, attempted to classify many of these levator syndromes under one term: tension myalgia of the pelvic floor. They studied 78 patients with urethral, vaginal and rectal pain syndromes and found that the symptoms were improved with techniques that caused muscle relaxation. Two-thirds of these patients recovered using rectal diathermy, Thiele's massage, relaxation techniques, biofeedback and physical therapy.

A combination of these therapies has been found to be the most effective means of correcting the dysfunctional muscles.

PELVIC FLOOR MYOFASCIAL THERAPY TECHNIQUES

The initial examination done per rectum or vagina in the lithotomy position consists of palpation of the entire pelvic floor, i.e. the urinary sphincter, pubourethralis, vaginalis and rectalis, the iliococcygeus, obturator internus, coccygeus and piriformis muscles in order to identify tightness, tenderness or taut bands, and/or pain radiation that duplicates symptoms.

The basic therapeutic plan is to make mechanical changes in the dysfunctional muscle groups. ("normalize")

- 1.) Eradicate trigger points to eliminate focus of the muscle spasm (contraction)
- 2.) Reeducate muscle to normal length and movement by stretching
- 3.) Patient to maintain with biofeedback- strengthening, relaxing, awareness.

Basic Therapeutic Plan - techniques

Techniques described to correct dysfunctional muscles are massage, stretch, trigger point injection, electrical stimulation, and pelvic floor reeducation using biofeedback combined with Kegel's exercise.

MANUAL THERAPY TECHNIQUES

In comparison to external muscle groups that can be treated manually with one or two hands, one is limited in techniques when working with one finger per rectum or vagina.

When tenderness, tightness, or taut bands are located, the treatment techniques that have been most effective are compression, stretching, strumming at right angles to the affected muscle bundles, or allowing the finger to glide in between fibers seeking the direction of least resistance "following the well."

Again because of the one finger limitation, the simultaneous use of external muscle stretching, i.e. piriformis stretch, isometric stretches of the pubococcygeus or external application of heat, will improve the results by facilitating greater muscle relaxation.

When these techniques are applied to women with urethral syndrome or IC the tender areas in the urinary sphincter, periurethral tissues and pubourethralis are compressed against the symphysis pubis and combined with lateral traction. The initial pressure is light and then is steadily increased as the patient adjusts to the technique. If the first digital-muscle contact is abrupt or too firm, muscle spasm can result.

After repeating this lateral stretching/compression maneuver several times, posterior traction is applied per vagina or rectum. The patient is then asked to contract the pubococcygeus muscle while the examiner's finger remains fixed. This results in an isometric contraction against resistance. Stretching of this type will have a reflex inhibitory effect on muscle tension, hence will result in greater relaxation and muscle length. With the finger in this new more posterior position, the patient again repeats the isometric contraction several times, which will result in even more elongation of the muscle.

The goal of this maneuver is to lengthen these anteriorly contracted muscles to decrease the periurethral tension, eradicate trigger points in the levator muscles, to reeducate the muscles to their normal range of motion for optimal function, and to bring the patient's awareness to the state of the muscle tension.

When the examining finger repeats the periurethral palpation, there will usually be less tenderness, softening and thinning of the contracted tissue mass

between the palpating finger and the symphysis pubis and improvement in the ability of the patient to contract and relax the pubococcygeus muscle.

In men with prostatodynia, ejaculatory pain or IC, a similar technique is used, but attention is directed to the endopelvic fascia and puboprostateae muscle (pubococcygeus) lateral to the prostatic edge from the bladder neck to the membranous urethra. Repetitive compression will loosen the tissue and decrease the sensitivity. Once this is accomplished attention is turned toward the urogenital diaphragm and area of the urinary sphincter. The curved internal finger is pointed toward the examiner and the urogenital diaphragm is stretched internally. The posterior margin is readily identified by the superficial transverse perineal muscle, which limits posterior movement.

Myofascial trigger points and muscle dysfunction can also spread to surrounding muscle groups. The myofascial trigger points and hypertonus of the commonly involved obturator internus can be detected by having the patient abduct her thigh in the lithotomy position against resistance, by pushing the knee laterally against her hand. This maneuver causes the obturator internus muscle to contract, shorten and widen under the levator muscle. Once this is done any tender points in the obturator internus are eradicated by using stretching and compression. The compression can be most effective if the patient brings the ipsilateral thigh toward the contralateral shoulder in the so-called piriformis

stretch. The stretch can be enhanced using fluori-methane spray/stretch techniques and/or heat.

Trigger points in the levator muscles overlying the obturator internus can be identified by noting any increase in pain under the palpating finger when the patient contracts the pubococcygeus.

These maneuvers will generally eliminate the tenderness during a given session.

However, repeated treatments will be necessary to alter the abnormal neuromuscular pattern, improve the patient's ability to control muscles, i.e. contract and relax, and eradicate trigger points for long term resolution of symptoms. If discrete myofascial trigger points remain after 6-8 treatments, or if they are so tender that manual therapy cannot be done, injections of 0.5% Bupivacaine and Lidocaine can be added, occasionally with steroids if it is near muscle attachment to bone. The technique of injection is dependent on location. If a 2-3.5 cm, 25-gauge needle directed through the perineum can reach the internal finger, it should be chosen. This technique is especially helpful in men with perineal pain secondary to trigger points of the urogenital diaphragm, pubourethralis or perineal body. If the affected points are deeper, a prostate aspiration biopsy guide placed on the examining finger is directed to the trigger point. Once the tip of the finger is in contact with the trigger point, a 22g-21cm spinal needle is inserted through the guide and the injection of 1-2cc is performed. After the trigger point injections are completed, it is important to put the muscle through a full range of motion of stretches. These injections can be

performed every 1-2 weeks depending on the progress. It is not uncommon for patients to experience a temporary exacerbation of symptoms before significant improvement.

Muscle groups that are external to the pelvic floor may also become dysfunctional as they attempt to compensate for any weakness or pain in the pelvic floor muscles. (Muscles that are recruited to assist weak sphincters or ones that become involved because of added strain from abnormal posture or movement.) The muscles that are the most commonly involved are those that have attachments to the bony pelvis or attach in close proximity to the urinary sphincter. These are the gluteal, iliopsoas, piriformis, quadratus lumborum, adductor magnus, and rectus abdominus. Once they become dysfunctional, they may perpetuate pelvic floor pain and hypertonus. As a corollary, strenuous exercise of the rectus abdominus muscles with myofascial trigger points can initiate a flare of urethral syndrome or IC.

Treatment should continue until all of the tenderness and tightness had dissipated. This requires visits 1-2 times a week for 8-12 weeks and is usually dependent on the length and severity of the symptoms.(to improvement, not complete resolution) As the trigger points and muscle tension decrease in severity, the frequency of therapy is decreased.

Treatment time to improvement depends on underlying and perpetuating factors. A patient who has developed central sensitization has a very anxious personality, not motivated, or is under severe stress take the longest to help.

Central sensitization may be the greatest factor preventing a rapid cure.(2nd layer) This is a process whereby continued painful stimulus to the central nervous system (spinal cord and brain) will cause a physical and chemical alteration of the neurons. The end result is a variety of sensory alterations, i.e.: allodynia – whereby a non-painful stimulus is perceived as painful hyperalgesia – increased pain with a painful stimulus, spontaneous pain wind-up – an amplification and prolongation of the pain sensation.

According to Gracely, Koltzenberg, Bonica central sensitization can be reversed if all noxious stimuli to the involved nerves are stopped. This is the basis for a holistic approach, which involves treating internal and external muscles groups, as well as other sensitivities such as stress and diet.

However, physical therapy alone will not be sufficient for meaningful change. A home program is instituted consisting of Kegel's instruction plus pelvic muscle stretches and strengthening, electrical-stimulation, and stress reduction and breathing techniques.(Significant other does stretching) Another important aspect is to teach the patient to become aware or tune into the increase in pelvic floor tension that occurs with stress. As a result they can periodically perform

Kegel's exercises consciously focusing on the relaxation phase. All of these techniques are used to reeducate the pelvic floor both to eradicate symptoms and prevent recurrences.

At the conclusion of the treatment program, patients usually have a reduction in symptoms and a better understanding of the pathophysiology, and are given tools to work with that will decrease noxious input to the CNS and lead to long term resolution. The understanding of the pathophysiology and techniques for self-management (control) will markedly reduce anxiety and hence contribute to muscle relaxation. This results in an upward spiral toward symptom resolution.