Athletic Therapy for a Tight Psoas Major Muscle

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The psoas major muscle is a deep hip flexor that aids in lumbar stability. (Faisal et al.,2017). It is a unique muscle because its location makes it difficult to examine and thoroughly palpate. The Psoas major muscle requires balanced strength and flexibility between the right and left sides. A unilateral weak or tight Psoas major muscle can lead to back and hip pain, along with other means of compensation which further discomfort. (Gibbons,2007). It is of great importance that pain caused by the psoas major muscle be assessed and treated by a trained professional. Although multidisciplinary professions such as manual osteopaths, massage therapists and medical doctors can provide benefit to a patient, this paper will demonstrate the high-quality care given to a patient who is suffering from a tight Psoas major muscle by a certified athletic therapist. An athletic therapist is an expert in musculoskeletal assessment and rehabilitation with a focus toward hands on soft tissue treatment and exercise rehabilitation. The extensive training athletic therapists receive enables them to work in a field setting, and a clinical setting. This incorporates injury management along with ongoing strength and flexibility programs which enhance competition and an active lifestyle.

The psoas major muscle originates on the T12, L1, L2, L3, L4 and L5 transverse processes of spinal vertebrae, as well as the anterior aspects of vertebral bodies and discs. It then inserts on the lesser trochanter of the femur. (Moore & Dalley,1999). Nerve supply for the psoas major is provided by the ventral rami of the L1, L2, and L3 nerve roots (Gibbons,2007). Fascia connective tissue associated with the psoas major incorporates with the diaphragm, and sacroiliac joint. The fascia tissue connected with psoas major is included with a longer myofascial chain which can cause tension from the tibialas posterior up to the mandible. (Muscolino,2017). Psoas major muscle tension resulting from contraction or tightness can pull on corresponding fascia, which effects breathing, and can contribute to low back pain. (Gibbons,2007). The psoas major along with the iliacus join to form the iliopsoas muscle. The iliacus muscle originates on the inside surface of the ilium, and fuses with the psoas major slightly superior to the inguinal ligament. Together, they travel inferiorly and insert on the lesser trochanter of the femur. (Moore & Dalley,1999).

The main action of the iliopsoas muscle is hip flexion. (Seidenberg & Bowen,2010). Contraction of the psoas major results in flexion of the hip due to the muscle insertion and origin attachment sites located above and below where the femur head fits into the acetabulum on the ilium bone. (Moore & Dalley,1999). Along with flexion, lumbar spine stability is also known to be provided by the psoas major. (Seidenberg & Bowen,2010). Since the Psoas major originates on the T12-L5 vertebral transverse processes, anterior bodies and discs, this results in the contribution of lumbar spine movement and stability. The Psoas major aids in maintaining lumbar lordosis during axial loading by maintaining muscle tone and tension as needed. (Gibbons,2007). This provides efficient biomechanics of the lumbar spine during activities such as lifting. The psoas muscle is activated during upright positioning such as standing, forward flexion and lifting. (Gibbons,2007). Equal activation and tension of the left and right psoas major will result in balanced stability during activities.

Lateral flexion of the lumbar spine is supported with unilateral contraction of the psoas major. McGill (2002), explains lower back stability with a fishing rod analogy. The vertebrae being like a fishing rod placed in a vertical position with tension wires attached to it at various levels all around it. Surrounding muscles act as the tension wires. In this case, the psoas major attachment to the T12-L5 vertebrae must maintain equal tension all around to maintain proper upright positioning with efficient lumbar lordosis. Increased tension will fail to maintain this position and result in compression of the vertebral bodies, creating an increased lordotic curve. Sajko and Stuber (2009) explain greater tension on one side will increase compression on that side, leading to a lateral flexion toward the tight side. This causes inefficient biomechanics while maintaining an upright weight bearing position and during movement. If one side of the psoas major is tight, this will pull on the lumbar vertebrae on the same side of tightness in a compressive force. (Sajko & Stuber,2009). Tension pulling the vertebral bodies and discs together can contribute to shearing forces during movement. (Anderson & Behm,2005). Compression will apply pressure on the vertebral bodies, vertebral ligaments, facet joints, intervertebral disc, and spinal nerves. All of which lead to discomfort. Continued compression can excite an inflammatory response, and elicit a protective mechanism from surrounding muscles by tightening up. (Houglum,2001). The quadratus lumborum, erector spinae, gluteus medius, gluteus maximus and piriformis muscles can become tight as secondary effects. (Seidenberg & Bowen,2010). This may lead to further postural stresses such as a misaligned sacroiliac joint, an anterior pelvic tilt with an increased lordotic curve, and tight hamstrings. (Seidenberg & Bowen,2010). Nerve pain can be a result of compressed vertebral bodies and discs, or brought on by a tight muscle such as the sciatic nerve being compressed by the piriformis muscle. Pain from a tight psoas major muscle can be felt in the lower back, lateral hip, anterior hip, or anterior thigh. Postural changes may contribute to further discomfort such as an ache in the piriformis, tight hamstrings, and tight gastrocnemius muscles. (Anderson et al.,2000). Pain must be treated, however it is of great importance to conduct an assessment to determine where the cause of pain originates from. Resolving the cause must occur along with resolving the consequential signs and symptoms such as postural misalignments and tight muscles. (Magee,1997).

Shortening of the psoas major muscle can be seen in individuals who sit for long periods of time, or athletes who play sports that require a bent over position such as cyclists, downhill skiing, hockey goalies, hockey players, volley ball players, and rowers (Sajko & stuber,2009). A weak psoas major muscle can also contribute to back instability and postural misalignment. Therefore, it is important to not only stretch the tight side, but strengthen the muscle to ensure proper functioning. (Seidenberg & Bowen,2010).

Anyone who is suffering from pain caused by the psoas major will benefit greatly by seeking treatment from an athletic therapist. Athletic therapy provides high quality knowledge in functional anatomy which promotes pain free movement for their patients. (Kahanov & Payne,2022). An assessment will determine the cause of pain along with determining compensations which have taken place due to the injury (Magee,1997). Athletic therapy sessions will target the painful sites, along with the cause of pain, followed by an ongoing program to prevent the injury from reoccurring. Seidenberg and Bowen (2010) explain an assessment for a patient with back and/or hip pain caused by a tight psoas major will require a history, observation, passive and active range of motion, strength assessment, special tests and palpation.

Patient history is necessary when initiating an assessment. Questions such as sports, daily activities including work will give an indication of anatomical stresses on the patient. Finding out the location of pain and details regarding it will also be of value. Information such as dull, sharp, radiating pain, along with what aggravates and alleviates discomfort will help determine an anatomical and biomechanical explanation regarding the source of injury. A history of previous injuries and family history of medical conditions will also be an asset to have on file. (Prentice,2003).

Patient observation by the athletic therapist must begin at the earliest possible opportunity. Either observing movement of the athlete during a sport activity if field work is provided, or in the waiting room upon greeting the patient for a clinical appointment. (Prentice,2003). Upon clinical observation, while the patient is standing upright, observing posture from the anterior, posterior and lateral sides are necessary. General postural evaluation includes if the head, shoulder, spine, pelvis, knee and ankle/foot placement are in an anatomically neutral position. (Magee,1997). If there are any abnormalities, such as a forward head poke, internally rotated shoulders, hyperextended knees or foot pronation, they should be noted and touched upon during the rehabilitation program. Specific to the psoas major, observing if the lumbar lordotic curve is increased with an excessive anterior pelvic tilt could indicate a tight psoas major. (Seidenberg & Bowen,2010). According to Magee (1997), a normal lumbosacral angle is 140 degrees while a patient is in a standing position. A normal sacral angle while standing is 30 degrees. Analyzing hip levels, and observing if there is a hyperextended knee, could provide information toward sacroiliac joint alignment. (Seidenberg & Bowen,2010). This may give information toward causes of tight hamstrings, quadratus lumborum tightness and potentially weak hip stabilizers such as the gluteus medius and piriformis.

Range of motion must be evaluated for the lumbar spine and hip. (Seidenberg & Bowen,2010). Any compensations, restrictions, sites of pain or referral pain must be recorded. Active range of motion for the lumbar spine can be accomplished in a standing and seated position. While asking the patient to flex the spine while standing, it can be observed for scoliosis. During lumbar flexion, extension, lateral flexion and rotation, it must be determined if movement is occurring from the lumbar spine instead of other compensating joints. (Magee,1997). Observations of any curvature, knee bend or flexion from the hip and thoracic spine should ne noted. The same notes should be observed while the patient is in a seated position. Seated lumbar range of motion enables the athletic therapist to observe a more isolated lumbar movement because the hips and pelvis are fixed on the treatment table. Normal range of motion for lumbar flexion is 40-60 degrees, lumbar extension is 20-35 degrees, lateral flexion is 15-20 degrees, and lumbar rotation is between

3-18 degrees (Magee,1997). When the patient is seated with arms crossed in front, range of motion observation should determine pain, compensation or any differences between the right and left sides. Lumbar passive range of motion can be conducted while sitting in the same position while the athletic therapist manoeuvres the patient. Isometric muscle testing for the lumbar spine can also be conducted in the same seated position with both arms crossed. (Kahanov & Payne,2022). Pain and weaknesses should be noted. Hip range of motion also needs to be tested. Normal ranges for hip flexion according to Magee (1997), are 110-120 degrees, hip extension is 10-15 degrees, hip abduction is 30-50 degrees, hip adduction is 30 degrees, hip medial rotation is 30-40 degrees and hip lateral rotation is 40-60 degrees. Hip active and passive range of motion, with isometric strength testing for flexion, abduction, adduction medial and lateral rotation can be conducted with the patient in supine position. Hip extension will be conducted with the patient prone. Pain, restrictions and differences between right and left sides must be recorded.

A patient who is suffering back pain due to a tight psoas major muscle will present with limited hip extension, and pain during hip flexion. (Sajko & Stuber,2009). Compensation of tight muscles may limit lumbar and hip range of motion as well. The intensity of pain and tightness will vary, and must be evaluated. Activating hip flexion during strength testing may elicit pain. It is important to determine if pain from muscle contraction is initiated by the psoas major, or rectus femoris muscle. (Magee,1997).

Special tests to be conducted during the physical assessment should include the faber test with the patient lying supine with the leg placed in a figure four position. (Prentence,2003). If the bent knee can not move into abduction toward the table, this indicates a positive faber test due to iliopsoas spasm which limits range of motion. Location of pain and limited movement must be monitored. Seidenberg and Bowen (2010) suggest the thomas test will determine if the hip flexors are tight. The patient lies supine at the end of the table. One knee will be lifted to their chest while other leg remains down and relaxed. The athletic therapist must observe for increased lordosis, and if the relaxed leg raises off of the table. These observations indicate a tight iliopsoas. If the knee remains straight, that indicates tight quadriceps. Ely's test will also determine a tight rectus femoris muscle. (Magee,1997). The patient is prone, while their knee is passively flexed. Observing if the the ipsilateral anterior superior iliac spine raises as the knee is bent will indicate a tight rectus femoris. Other special tests that provide information regarding surrounding structures are the Trendelenburg test to determine hip stability, the leg length discrepancy test, and sacroiliac movement tests which require the patient to raise one knee while standing. (Seidenberg & Bowen,2010).

Palpation of the psoas major and surrounding structures will help determine where pain control and soft tissue therapy are needed. The psoas major muscle is difficult to palpate due to its deep location. The athletic therapist can palpate it by positioning the patient supine with a 30-degree hip flexion, and palpating medial to the anterior superior iliac spine. (Sajko&Stuber,2009). Confirmation of the psoas major can be done by asking the patient to activate the muscle by slightly flexing that hip. Feeling tension will confirm correct location. Discomfort and high amounts of tension will indicate a tight muscle. Palpating the rectus femoris, gluteus medius, piriformis, quadratus lumborum and erector spinae are all necessary to determine tender sites and tight muscles. (Seidenberg & Bowen,2010)

The athletic therapist can recommend that the patient see their medical doctor for additional tests such as an X-Ray or MRI or to prescribe pain medication.

Following the assessment, an initial pain control and preliminary treatment plan will be provided. Firstly, the patient will be instructed to reduce the activity that initiates pain. If it is a sport, taking time off, and modifying activity will be necessary. One who sits for work, time off or intermittent change of position throughout the day will be encouraged. The initial priority of therapy will be pain control. (Houglum,2001). The athletic therapist can start by gently stretching the Hip flexor muscles by doing the thomas stretch technique and teaching safe pain free stretching the patient can perform themselves. (Kahanov & Payne,2022). The muscle energy technique for the hip flexor will also prove beneficial. Gently releasing the quadratus lumborum, erector spinae, gluteus modius, piriformis and hamstrings by massage may give the patient relief from discomfort. (Seidenberg & Bowen,2010). Modalities such as transcutaneous electrical neuromuscular stimulation, TENS and interferential current, IFC can be place on the site of pain to activate the pain gate mechanism for pain management. (Starkey,199). The goal of athletic therapy treatments is to decrease lumbar spine compression caused by the tight psoas major muscle while treating compensatory ailments such as posture misalignments, tight muscles, and fascia pulls. Lumbar vertebrae compression may compress discs and nerves which will also be addressed if needed.

Athletic therapy for a patient with a tight psoas major will include continued pain control, therapeutic modalities, rehabilitative stretching, activating core and stabilizer muscles around the back and hips, soft tissue therapy, and return to sport or activity with an ongoing preventative program. (Prentice,2003). Continued pain control throughout all phases of rehabilitation will ensure a progressive, successful outcome. With the primary goal to reduce pain and prevent it's return, therapies such as soft tissue release, pain modulating modalities, ice and adequate recovery from therapy sessions will allow a safe progression toward recovery.

Therapeutic modality use for a tight psoas major will primarily be used for pain modulation. Applying TENS to the sites of pain will reduce the perception of pain through the gate control theory, and IFC can also help bring in blood flow to promote healing. Applying ice can help slow painful nerve stimuli and heat therapy such as a hydrocollator pad will help release muscle tension to further reduce pain. (Starkey,1999)

Soft tissue therapy will serve great value in helping relieve pain from a tight psoas major muscle. Direct release of the psoas major is difficult due to its deep anatomical positioning, but according to Sajko and Stuber (2009), this can be accomplished by trigger point release medial to the anterior superior iliac spine. For anatomical accuracy, the patient should have a flexed hip at 30 degrees during the release. The athletic therapist will feel the tight muscle release after tolerable pressure is applied to the trigger point. This release can reduce lumbar compression thus reducing pain. Massaging other areas of discomfort that arise from a compressed lumbar spine such as the quadratus lumborum, erector spinae, gluteus medius, and the piriformis muscle will be beneficial. Once these muscles are released, an efficient activation can occur from those muscles to support core stability. (Seidenberg & Bowen,2010). Fascia tissue from the Psoas Major is interconnected with the sacroiliac joint, and diaphragm. It is also connected to a greater anterior fascia chain that extends from the mandible to the tibialis posterior. (Gibbons,2007). Regarding soft tissue release specific to the psoas major, fascia release techniques can be used over the abdominals, toward gluteus medius and the sacroiliac joint. This can further release discomfort, allowing for efficient breathing and sacroiliac joint function. Fascia release treatment can extend over the full body that starts at the mandible, and proceeds down to the tibialis posterior. (Gibbons,2007). The patient can be instructed on self release using a texturized foam roller over the said areas.

Stretching is a high priority for the patient, specifically for hip flexors and quadriceps. Stretching must be performed gently with a gradual increase in duration and intensity. Performing the thomas stretch for hip flexors and quadriceps is an efficient way to assess and treat tight muscles. (Magee,1997). The patient will be supine at the edge of the table, with one knee held at their chest. The athletic therapist applies anterior to posterior pressure on the thigh to target the iliopsoas muscle. Flexion of the knee during this stretch will target the quadricep muscle as well. Proprioceptive neuromuscular facilitation PNF technique can be used as therapy advances and pain is decreased. (Anderson et al.,2000). Muscle energy technique by isometrically contracting the hip flexors, fully relaxing and moving them into a full range of hip extension motion followed by a passive stretch will also show successful results. (Chaitow,2013). Self stretching by assuming a lunge position should be encouraged for a home program. It is important to teach form, and ensure a proper pelvic tilt is maintained during the stretch. Surrounding muscles must be included in a flexibility program. Hamstrings, iliotibial band, and gluteus maximus are to be focused on as well. (Seidenberg & Bowen,2010). Heating the muscles prior to being stretched will enhance muscle release. Using hydrocollator pads, or a pain free active warm up are ways to heat the muscles.

Once pain has subsided and a flexibility regime is underway, rehabilitative exercises with a focus on posture and core are needed. (Hibbs et al.,2008). Transverse abdominal activation will aid in bringing an anterior pelvic tilt into neutral position, along with hamstring stretching and psoas major release. Gluteus medius, maximus and oblique activation will provide core stability. This provides support for lumbar spine stabilization, helping the psoas major which is the main priority. Core muscles should be activated first in a non weight bearing position with progression to weightbearing, multi muscle movements. Seidenberg and Bowen (2010) explain that core must be activated during multi muscle movements because they generate the initial full body motion. In the early stages of rehabilitation, core exercises can be performed in a non weight bearing position, with individual muscle isolation, then progressed to weight bearing, multi-muscle moves. Proprioceptive moves such as performing exercises on uneven surfaces effectively engage core and balance. (Hibbs et al.,2008). It is imperative that the athletic therapist monitors the patients form while doing the exercises. (Kahanov & Payne,2022). This ensures proper muscle recruitment and form. During these movements, lower abdominals need to be contracted with the pelvis in neutral position which will prevent the psoas major from becoming tight. Specific hip flexion exercises can occur once the movement is pain free, and supporting core muscles are involved. An example is supine leg raises with transverse abdominus, and quadratus lumborum co contraction. This allows the psoas major to gain strength, while reducing lumbar spine compression.

When proper posture is achieved, core has been activated and pain from a tight psoas major has been resolved, return to sport or activities must be resumed in a progressive manor. (Houglum,2001). The primary goal of returning to regular activity is prevention of re-injury. Performing sport specific moves, and training muscles specific for sport requirement will be complimented by activating the core, and maintaining flexibility between right and left sides. Single leg training, or on an uneven surface such as a bosu ball will effectively activate balance and core during movements. (Houglum,2001). Continued flexibility of the hip flexors, quadriceps, IT band, hamstrings and gluteus muscles must be maintained. (Seidenberg & Bowen,2010). An ongoing strength and flexibility program with regular soft tissue treatments such as fascia release, massage and muscle energy technique will serve very useful for a maintained injury free active lifestyle. A stretching routine, with foam rolling can be accomplished regularly at home. Core muscles must be continuously activated to stay effective. Sport specific, and multi muscle movements need to incorporate core stabilization. This requires regular and consistent training. An athletic therapist can provide a balanced, individualized program for the patient. (Kahanov & Payne,2022).

A patient who has a tight psoas major muscle will experience recovery and prevention advantages from seeking out athletic therapy services. Safe, progressive therapeutic stretching and exercising will be closely monitored to ensure that proper form and muscle recruitment are achieved. Soft tissue therapy will be provided throughout the process which enhances proper biomechanics of body movements with goals of decreased pain. Each patient will present with various levels of pain and will respond to rehabilitation differently, so an athletic therapist will continuously monitor the progression to ensure a successful outcome. Personalized home programs are valuable in the recovery process, provided the athletic therapist educates the patient on form, and activity frequency. Once the injury is resolved, the patient will be provided with a preventative program that matches their sport and individual activities. Following the injury prevention program, taking part in self treatment such as foam rolling, stretching and seeking regular soft tissue release sessions will aid the patient in continued participation of activity and sport.

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