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Chronic Back Pain as a Clinical Manifestation of Myofascial Pain Syndrome

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ABSTRACT

Introduction: Myofascial pain syndrome (MPS) is a condition of muscle or fascial pain, acute or chronic, involving sensory, motor or autonomic function, which is associated with myofascial trigger points (TrP). The pain caused by TrP can cause various symptoms of chronic diseases, such as tension-type headaches, migraines, temporomandibular pain, shoulder pain, or lower back pain. Back pain that persists for more than 12 years is called chronic back pain.

Case Report: A 24-year-old man came to the clinic with complaints of low back pain that had been intermittent for the previous month and felt worse for the last week. For 1 year, the patient has been diagnosed with non-specific back pain due to muscle stiffness. Since the last 1 week, the back pain has not improved, and the patient has begun to find it difficult to carry out activities such as sitting and squatting, and his hands cannot touch his feet when bending. The pain is said to be like pressure and radiates from the right buttock and back of the right thigh. The pain is aggravated if the patient stands and sits for a long time, the pain is reduced if the patient sleeps on his back. Complaints accompanied by tingling in the right buttock area spreading to the back of the right thigh. The Numeric Rating Scale (NRS) was found to be 7 out of 10 for headaches. The patient is then given dry needling therapy and then observed for 30 minutes. The patient's NRS after the procedure was 2 out of 10.

Discussion: In an epidemiological study, women experienced MPS more often than men, and it was found that the prevalence in women was 6 times higher than in men. Poor posture is a risk factor for chronic back pain. The diagnosis of myofascial pain is best made through a carefully analyzed pain history, which is confirmed by a consistent physical examination. TrP in the Piriformis muscle, Gluteus Minimus, and Gluteus Medius will cause symptoms of referred pain in the waist, buttocks, thighs and calves. MPS treatment in dry needling aims to restore functional ability by reducing pain caused by TrP.

Conclusion: Chronic back pain can be a syndromic manifestation of MPS. A complete history and careful physical examination are significant in diagnosing MPS, the treatment given can reduce pain, rigidity and increase mobility in patients with MPS.

Keywords: Chronic back pain, myofascial pain syndrome, myofascial trigger points

INTRODUCTION

Myofascial pain syndrome is a condition of muscle or fascial pain, acute or chronic, involving sensory, motor or autonomic function, which is associated with myofascial trigger points (TrP). [1] TrP is characterized as a hypersensitive point and a complicated local area in the skeletal muscle that will be painful when pressed, stretched and contracted and will also provide referred pain

at a distant location. 2 Motor symptoms can include motor dysfunction or muscle weakness due to motor inhibition, limited movement and muscle stiffness. Sensory symptoms can include tenderness, referred pain, hyperalgesia, or allodynia. Autonomic symptoms may include sweating, pilomotor activity, changes in skin temperature, lacrimation, and salivation.[2]

Myofascial pain causes chronic pain manifestations, causing disability in sufferers, loss of work time and high medical costs. The complex clinical symptoms of myofascial pain, the aetiology and mechanisms of which are not yet clearly understood, cause difficulties in establishing diagnosis and treatment. Improper treatment can worsen the patient's clinical symptoms.[3]

The pain caused by TrP can cause various symptoms of chronic diseases, such as tension-type headaches, migraines, temporomandibular pain, shoulder pain, or lower back pain. About 5-36% of low back pain is chronic back pain. Chronic back pain is defined as low back pain for more than 12 weeks, with one-third of all low back patients reporting moderate intensity low back pain lasting a year after the acute episode. In chronic back pain patients, a logical, multidisciplinary approach to treatment is most effective.[3]

Chronic back pain can involve anatomical factors, such as tearing of the piriformis muscle, injury to the ischial nerve, or abnormalities in the path of the ischial nerve. Secondary piriformis involves precipitating factors such as macro-trauma, micro-trauma, and ischemic effects. Only 15% are primary cases.[4] A complete history and thorough physical examination play a significant role in diagnosing this syndrome so patients can receive appropriate and optimal therapy. Until now, the therapy that can be given to Myofascial pain syndrome (MPS) can be in the form of pharmacological therapy and invasive procedures such as dry needling.[5,6]

CASE REPORT

A 24-year-old man came to the clinic with complaints of low back pain that had been intermittent for the previous month and felt worse for the last week. For 1 year, the patient had been diagnosed with non-specific back pain resulting from muscle stiffness. Since last week, the back pain has not improved, and the patient has begun to find it challenging to carry out activities such as sitting and squatting, and his hands cannot touch his feet when bending. The pain is said to be like pressure and radiates from the right buttock and back of the right thigh. The pain is aggravated if the patient stands for a long time and sits for a long time. The pain is reduced if the patient sleeps on his back. Complaints accompanied by tingling in the right buttock area spreading to the back of the right thigh are felt when the patient does activities such as standing for a long time and sitting for a long time. Complaints improve if the patient takes pain medication.

The patient has had a history of back pain for the last 1 year. Where the patient complained of pain radiating to the toes of the right foot; physiotherapy was carried out, and the EMG examination showed average results. Denied history of systemic disease such as diabetes mellitus. History of trauma denied. The patient works as a TikTok content creator and requires sitting for a long time at work, around 6-8 hours per day, and if there is overtime work it can be up to 12 hours.

On physical examination, the patient was found to be fully conscious with a Glasgow Coma Scale (GCS) of 15 and typical vital signs, namely blood pressure 120/70 mmHg, pulse 90 times/minute, respiratory rate 18 times/minute, and temperature 360 C. Numeric Rating Scale (NRS) obtained 7 out of 10 for low back pain. Neurological examination showed no abnormalities in the cranial nerves, the motor system was still standard, but tingling was found in the right upper buttock radiating to the right thigh, the patient found pressure on the piriformis muscle with a positive Lasegue sign. No signs of meningitis were found. The patient's language function, orientation, memory, emotions and cognition are not impaired. In localized status, spasms and TrP are found in hard local areas during palpation in the right

gluteal muscle and right piriformis muscle. Suppression of TrP in the right Gluteus Minus Muscle, Gluteus Medius, and Right Piriformis Muscle increases the pain intensity in the patient's waist, hamstrings, and right calf. The patient was given dry needling therapy by puncturing using a filiform needle at the TrP locations found, namely 2 points on the right Gluteus minimus muscle, 1 point on the right Gluteus medius, and 3 points on the right piriformis muscle.

DISCUSSION

Myofascial Trigger Point is still not clearly understood. Several authors mention that there are trigger or stimulus factors, both direct and indirect. Trigger points are thought to form in the muscle endplate, which causes changes and abnormalities in endplate activity at the neuromuscular junction. Continuous irritation of the endplate will cause excessive release of acetylcholine, which can cause localized tension and contraction of muscle fibres. 3 Common causes of myofascial pain can be direct or indirect trauma, pathological conditions of the spine, exposure to repetitive and cumulative stress, or position/posture. The body is not good.[7]

Until now, the concept regarding the origins of TrP formation states that excessive muscle activity, both acute and chronic, will trigger a cascade that leads to the formation of junctional bands, TrP and pain.[8] Simons has developed an integrated hypothesis regarding the process of TrP formation, which has three essential stages, namely (1) excessive release of acetylcholine, (2) shortening of sarcomeres, and (3) release of sensitizing substances. Excessive release of acetylcholine increases tension in skeletal muscle fibres and forms junction bands containing TrP. A continuous increase in tension in skeletal muscles will cause an energy crisis, local ischemia and hypoxia, which ultimately triggers the secretion of sensitizing substances that cause pain. The secretion of sensitizing substances then causes abnormal secretion of acetylcholine, thus ultimately completing the cycle of TrP formation.[8,9]

In an epidemiological study, women experienced MPS more often than men, and it was found that the prevalence in women was 6 times higher than in men, possibly related to the broader quadriceps femoris muscle (Q angle), differences in pelvic structure, or hormonal changes that can occur. Affects the muscles around the pelvis. In this case, the patient was a man who had experienced back pain for 1 year and had undergone an EMG examination and physiotherapy. Poor posture is a risk factor for chronic back pain. Compression or irritation of the sciatic nerve can occur if the piriformis muscle becomes inflamed, swollen, or stiff. This can occur due to excessive activity, sitting all day, and activities involving long sitting positions.[4] In this patient, the risk factor was found to be sitting for a long time while working, with a duration of 6-8 hours per day, and if the overtime condition could be more than 12 hours a day. The patient has worked for 2 years as a content creator.

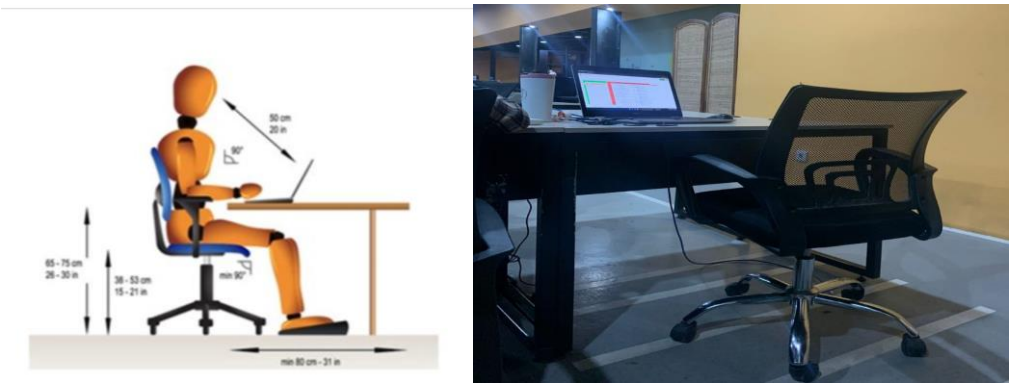


Figure 1. Ergonomic Working Position (left) and Patient Working Position (Right)[4]

From the patient's workplace, after backfilling, the chair height and table height were disproportionate, where it was found that the table height was 95 cm and the chair height was 60 cm. In comparison, the patient's height was 170 cm, which is the average Asian demographic height, from this, it can be found that the height of the table and chairs was disproportionate.

TrP in the Gluteus Minimus, Gluteus Medius and Piriformis muscles can cause referred pain in the back of the thigh, so it is often associated with several conditions, including tingling in the lower extremities, pain and stiffness when there is pressure on the piriformis muscle, such as when sitting, low back pain, pain when sitting for more than 15 minutes, pain when walking. The piriformis muscle acts as an external rotator, abductor, and flexor of the thigh, is responsible for postural balance when standing, and plays a role in lifting and rotating the thigh away from the body axis. When walking, abduction and flexion of the thigh play an essential role because they shift the body's weight to the opposite side of the lifted leg, preventing falls. The piriformis muscle originates on the anterior surface of the sacrum, at the level of the S2-S4 vertebrae, near the sacroiliac joint capsule and inserts on the superior medial aspect of the greater trochanter. The piriformis muscle is innervated by spinal nerves S1-S2 and sometimes L5. The sciatic nerve descends from the greater ischial foramen down the back of the thigh toward the leg via the inferior surface of the piriformis muscle.[10]

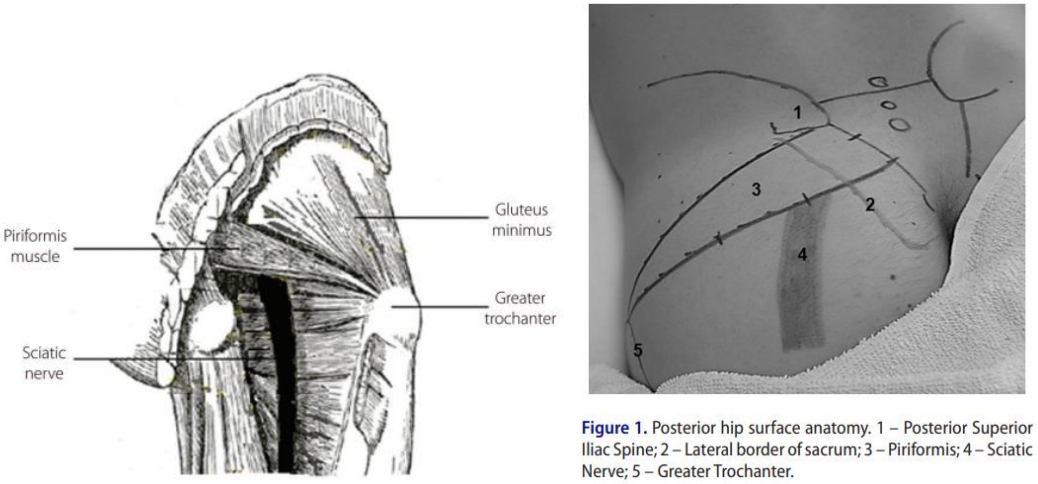


Figure 1. Posterior hip surface anatomy. 1 – Posterior Superior Iliac Spine; 2 – Lateral border of sacrum; 3 – Piriformis; 4 – Sciatic Nerve; 5 – Greater Trochanter.

Figure 2. Position of the piriformis muscle[10]

The diagnosis of myofascial pain is best made through a carefully analyzed pain history, which is confirmed by a consistent physical examination. Identifying pain distribution is one of the most essential elements in identifying and treating myofascial pain. Doctors should ask patients to identify the most painful areas using a single pain point. In addition, there is a typical and consistent pattern of referred pain on palpation of the trigger point. Pain can be projected in a peripheral referral pattern, central referral pattern, or local pain pattern. If a hyperintense area is identified, the referred pain area should be identified. Palpable bands are an essential consideration in identifying trigger points.[11,12] The three methods identified for trigger point palpation are flat, pincer, and deep. Flat palpation is performed by sliding the fingertip along the muscle fibres in the affected muscle group. The skin is pushed to one side, and the other finger drags along the muscle fibres. This process is repeated with the skin pushed to the other side. The band can be felt running under the doctor's finger. Palpation movements such as "playing the violin" identify specific trigger points. Pincer palpation is a method that involves grasping (grasping) the muscle firmly between the

thumb and index finger. The muscle fibres are squeezed between the fingers in a rolling pattern while trying to localize the band junctions. Deep palpation is used to find unclear trigger points through superficial tissue. The fingertips are placed over the muscle in the area where the suspected trigger point is located. When a patient's symptoms are produced through pressure in one particular direction, the trigger point may be thought to be located there.[13]

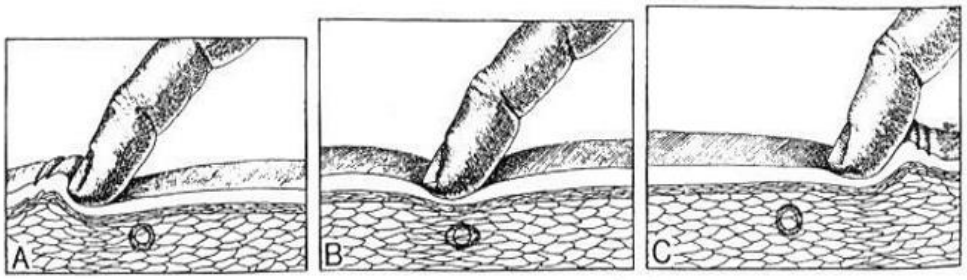


Figure 3. Cross-sectional schematic representation of the flat palpation technique at trigger points. (A) The skin is pushed to one side to begin palpation. (B) The fingertips are moved across the muscle fibres to feel the underlying junctional band. (C) Skin is pushed to the other side to complete "snapping" palpation [13]

The piriformis, gluteus minimus and medius muscles have different referred pain patterns and symptoms. TrP in the piriformis muscle will cause tingling and pain that spreads from the waist to the back of the thigh. If there is stiffness in the muscles, this will cause tingling in the painful area, usually made worse by activities such as sitting for a long time and standing for a long time. TrP in the gluteus minimus muscle will cause referred pain in the buttocks area to the upper calf. TrP gluteus medius produces pain referred to in the lower part of the waist and the middle of the buttocks.[14]

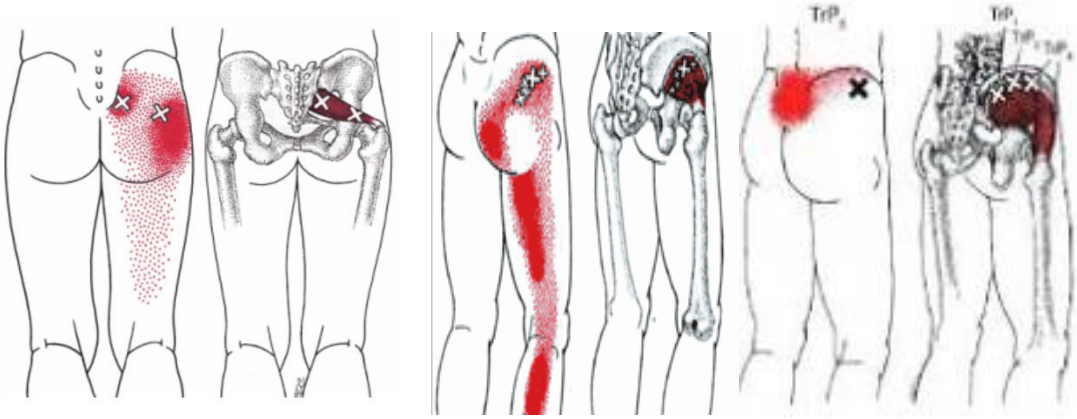
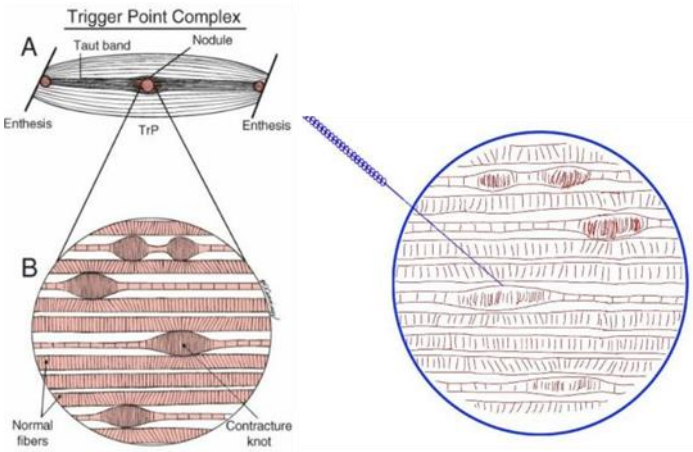


Figure 4. Referred Pain Patterns in the Piriformis Muscle, Gluteus Minimus, Gluteus Medius.[14]

MPS treatment aims to restore functional ability by reducing pain caused by TrP. Patients experience improved range of motion, decreased pain intensity and visible improvements in mobility after therapy. Dry needling is a therapeutic method used to inactivate TrP. The insertion of a fine filament needle can release myofascial TrP if the needle elicits a brief twitch response in the inserted muscle. The short twitch response is caused by the stretching of the muscle fibres. Relaxation of the muscle fibres after a short twitch response causes the return of microcirculation in the muscle and increases blood flow and oxygenation to the junctional band, thereby reducing pain in patients with MPS. (Jafri, 2014)



Gambar 3. TrP in skeletal muscle and dry needling insertion site.[15]

CONCLUSION

Chronic back pain can be a syndrome manifestation of MPS; chronic low back pain can occur due to stiffness in the piriformis muscle which can cause referred pain with clinical pain radiating from the waist to the back of the thigh followed by tingling, another thing that occurs is MPS in the gluteus minimus and medius muscles which has a pattern of referred pain in the lower back to the middle of the buttocks and is followed by radiating pain in the upper buttocks to the upper calves. A complete history and thorough physical examination are significant in diagnosing MPSand and identifying pain in pain, namely identifying band junctions, because it is an essential development in identifying Trp. Dry needling therapy can reduce pain and rigidity and increase mobility in patients with MPS.

Declaration by Authors

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