

Effectiveness of Muscle Energy Technique to Quadratus Lumborum for Treating Innominate Up-Slip Sacroiliac Joint Dysfunction: A Single Case Study

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ABSTRACT

Background: Innominate up-slip sacroiliac joint dysfunction accounts for 10% to 20% of all sacroiliac joint dysfunctions. There are not enough studies indicating the efficacy of muscle energy techniques on innominate up-slip sacroiliac joint dysfunction.

Objective: To find out the effectiveness of muscle energy technique to quadratus lumborum for treating innominate up-slip sacroiliac joint dysfunction.

Methodology: A case study, a male of age 44, who was diagnosed with innominate up-slip sacroiliac joint dysfunction, was included in the study and the visual analog scale (VAS) for pain was assessed and Oswestry disability index (ODI) was asked to be filled. Gillet test was performed before intervention which again was performed after the intervention. Supine to sit test was performed to assess the limb length discrepancy and was performed again after the intervention. Muscle energy technique was applied for two weeks. Pre and post outcome measures were recorded and compared.

Results: The pre intervention score reflected the visual analog scale was 7; Oswestry disability index was 72%, Gillet test to be positive. The post intervention score reflected the visual analog scale was 0; Oswestry disability index was 4%, and Gillet test to be negative. Supine to sit test showed that there was a limb length discrepancy of 5 cm both at supine and prone. The pre and post interventions when compared showed significant effect of muscle energy technique on up-slip innominate sacroiliac joint dysfunction.

Conclusion: Muscle energy technique was effective on treating innominate up-slip sacroiliac joint dysfunction.

Keywords

Innominate up-slip; Sacroiliac joint dysfunction; Muscle energy technique

Introduction

Sacroiliac Joint Dysfunction is pain in and around Sacroiliac Joint region that is caused by abnormal motion in the sacroiliac joint. It typically results in inflammation of the sacroiliac joint, and can be debilitating [1]. SI joint dysfunction has many causes, including inflam-

matory arthritis, ankylosis, osteoarthritis, and post-traumatic arthritis [2].

Recent studies have proven that the Sacroiliac Joint to cause pain not only in the lower back, but also in the groin and thigh [3]. The type of Sacroiliac Joint Dysfunction is also based on the bio-mechanics of its dysfunction. Innominate

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up-slip sacroiliac Joint Dysfunction accounts for 10% to 20% of all Sacroiliac Joint Dysfunction [1]. The degree of freedom of the Sacroiliac Joint normally allows 2 degrees of upward and downward translation (craniocaudal) translation of an innominate relative to sacrum [4].

A spasm in the quadratus lumborum might pull the innominate bone upwards above to the range of motion provided by the sacroiliac joint, this might result in the joint getting stuck upward causing an up-slip sacroiliac joint dysfunction [5]. There are many studies done on sacroiliac joint on the application of Muscle Energy Technique but there are no studies specifically on innominate up-slip sacroiliac joint dysfunction co-relating with the treatment of Muscle Energy Technique. The purpose of the study was to find out the efficacy of Muscle Energy Technique in treating innominate up-slip sacroiliac joint dysfunction.

Methodology

A male of age 44 who complained of pain in the area of the right iliac crest, sacroiliac joint and in the groin region for the past seven months. The patient provided his written informed consent prior to participation in the study. The patient experienced SI joint pain when bending at the waist. Additionally, severe pain occurred in the posterior areas of the right iliac crest and sacroiliac joints after standing for longer than an hour or after walking for more than 15 minutes. The patient was diagnosed with an innominate up-slip sacroiliac joint dysfunction by performing the supine-to-sit test where there was a limb-length discrepancy of the right lower limb, which was found not to change either during sitting or lying. Next, the Gillet test was performed and found to be positive. The patient described his pain on the visual analog scale with "0" representing no pain and "10" the worst imaginable pain. A VAS score of 7/10 was reported during palpation of the right iliac crest posterior area in a prone position. The patient was asked to fill the Oswestry Disability Index (ODI) and its score was 72%. Muscle energy technique was performed on quadratus lumborum. The subject was positioned side lying on the couch. The therapist stood at the side of the couch facing the anterior aspect of the patient. The therapist placed the palm over the iliac crest with reinforcement of the other hand, the innominate was pulled down till the barrier was felt. Once the barrier was palpated, the subject was asked to pull the innominate

upwards against the resistance (muscular effort is 1/3rd of the maximal effort). The subject was asked to relax and the innominate was pulled down further. This sequence was repeated 3-5 times for two consecutive weeks [6,7].

Results

After performing the muscle energy techniques for quadratus lumborum for two consecutive weeks the patient reported as Visual Analog Scale (VAS) of 0 and the Oswestry Disability Index (ODI) was evaluated to be 4 and there was no limb length discrepancy found during supine to sit test. Gillet Test was negative.

Discussion

The subject informed that the pain initiated when the subject strained on leaning forward and side flexing to the left to pick a suitcase up from the floor, the suitcase was heavier than he expected it to be then he said that he had a catch over his right hip and heard a click sound followed by an unbearable pain and he had pain ever since.

When the subject's pelvis was palpated at standing it was clearly understood that the levels of the Anterior Superior Iliac Spine (ASIS) and Posterior Superior Iliac Spine (PSIS) was hiked above the level of the second spinal vertebra. Supporting the finding the supine to sit test showed a 5 cm limb length discrepancy, and gillet test was found to be positive confirming Sacroiliac Joint Dysfunction. After analyzing the history told by the subject and diagnosing it was concluded that an increase in the tension in the quadratus lumborum subsequently pulled upward from its origin (posterior iliac crest), which eventually resulted in a 'right up-slip' of the sacroiliac joint [8,9].

After the application of Muscle Energy Technique for two consecutive weeks the subject experienced no pain. The reduction in pain due to MET can be extrapolate on the basis of its neurophysiology, as described by Chaitow that PIR refers to the subsequent reduction in tone of the agonist (Quadratus Lumborum) muscle after isometric contraction. This occurs due to stretch receptors called Golgi tendon organ that are located in the tendon of the Quadratus Lumborum muscle. These receptors react to overstretching of the muscle by inhibiting further muscle contraction. In more technical terms, a strong muscle contraction against equal counterforce triggers the Golgi tendon organ.

The afferent nerve impulse from the Golgi tendon organ enters the dorsal root of the spinal cord and meets with an inhibitory motor neurone [5]. Lewit confirm this observation that the increased tension of the affected muscles and the resulting pain and dysfunction are both relieved by restoring the full stretch length of the muscle [10]. A study done by Noelle M Selkow [11] supports the findings of this study by concluding that Muscle Energy Technique is effective in decreasing pain in patients with acute low back pain and another study done by Roberts BL where he described two techniques of soft tissue manipulation *viz* neuromuscular technique and found that Muscle Energy Technique can reduce Pain, muscular spasm and lengthen muscle fibers [11].

The application of Muscle Energy Technique led to decrease of tension in quadratus lumborum hence correcting the malalignment of the sacroiliac joint which was confirmed after two weeks of treatment when the supine to sit test was performed, the supine to sit test showed no discrepancy of the length of the limbs.

Conclusion

Muscle energy technique to quadratus lumborum was effective for treating innominate up-slip sacroiliac joint dysfunction. We suggest the study can be done with large number of samples with Electromyography evaluation. A comparison of muscle energy technique with other manual therapeutic techniques are recommend.

References

1. Brolinson PG, Kozar AJ, Cibor G. Sacroiliac joint dysfunction in athletes. *Curr. Sports. Med. Rep* 2 (1), 47-56 (2003).
2. Sharma D. Effects of muscle energy techniques on pain and disability in subject with sacroiliac joint dysfunction. *Int. J. Physiother. Res* 2(1), 305-311(2014).
3. Van Wingerden JP, Vleeming A, Buyruk HM *et al*. Stabilization of the sacroiliac joint in vivo: verification of muscular contribution to force closure of the pelvis. *Eur. Spine. J* 13(3), 199-205 (2004).
4. Chaitow L. Muscle Energy Techniques. 2nd edn. Churchill livingstone (2001).
5. Rana K, Bansal N, Savita. Comparative analysis on the efficacy of G.d. maitland's concept of mobilization & muscle energy technique in treating sacroiliac joint dysfunction. *Indian. J. Physiother. Occup. Ther* 3(2), 18-21 (2009).
6. Zelle BA, Gruen GS, Brown S, *et al*. Sacroiliac joint dysfunction: evaluation and management. *Clin. J. Pain* 21(5), 446-455 (2005).
7. Lewit K, Simons DG. Myofascial pain relief by post isometric relaxation. *Arch. Phys. Med. Rehab* 65(8), 452-456 (1984).
8. Selkow MN, Grindstaff TL, Cross KM, *et al*. Short term effect of Muscle energy technique in individual with lumbopelvic pain: A pilot study. *J. Man. Manip. Ther* 17(1), E14-E18 (2006).
9. Vleeming A, Volkers AC, Snijders CJ. Relationship between form and function of the sacroiliac joint. Part II: Biomechanical aspects. *Spine (Phila Pa 1976)* 15(2), 133-136 (1990).
10. Lauridsen HH, Hartvigsen J, Manniche C, *et al*. Danish version of the Oswestry index for patient with low back pain. *Eur. Spine. J* 15(11), 1717-1728 (2006).
11. Ozgocmen S, Bozgeyik Z, Kalcik M, Yildirim A. The value of sacroiliac pain provocation tests in early active sacroiliitis. *Clin. Rheumatol* 27(10), 1275-1282 (2008).