

Case Study by Jace Phillips

**The Effects of Dry Needling the Gluteus Medius for Chronic Low
Back Pain**

Introduction

Believed to be the leading cause of individuals seeking medical care and absence from work, low back pain is a widely studied and researched topic.^{4,9} A complex issue, low back pain is thought to be contributed to by various systems and body regions.^{2,14,15,17,20,21,23,24,26} This may include but is not limited to cognitive and psychosocial beliefs^{3,14,15,23,25,26} or referral relationship between other orthopedic body regions.^{2,13,17,20,24} Weiner and colleagues, in studying chronic low back, describe this issue as a syndrome which may have multiple contributing factors rather than a single pathology in itself, which highlights the importance of individualized care.²⁴ Chronic low back pain (CLBP) is typically defined as greater than three months in duration.⁴ This may also contribute to the difficulty in finding consensus in large scale studies. As Delitto and colleagues point out in their 2012 CPG, "...guidelines are not intended to be construed as or to serve as a standard of medical care. Standards of care are determined on the basis of all clinical data available for an individual patient and are subject to change as scientific knowledge and technology advance..." Moreover, increasing evidence suggests there is difficulty linking a pathoanatomical diagnosis to low back pain.^{1,4,9,16} When lacking an obvious diagnostic cause, patients are most commonly given the diagnosis of non-specific low back pain.^{4,9}

The idea of providing treatment to a body region outside the specific area of complaint is not new and is well substantiated in current physical therapy literature.^{2,4,9,20,21,24} Evidence exists to support a role of the hip in low back pain^{2,20,21,24} and it is thought the gluteus medius syndrome and hip osteoarthritis (OA) may contribute or be associated with low back pain and degenerative changes.^{13,20,21,24} Emerging evidence supports treatment of the hips, including joint mobilization and strengthening, in patients with a primary complaint of low back pain, with or without hip pain.² Further evidence suggests low back pain may be associated with gluteus medius weakness and that hip strength should be routinely assessed in individuals with low back pain.^{17,21} While no single treatment style fits all diagnoses, it is clear the hip should be examined, and treated when necessary, in patients with CLBP.

Attempts have been made to discover specific interventions which may best help individuals with non-specific CLBP. An overarching theme within literature reviews is the suggestion that an active approach should be taken.^{1,4,9,12,16} Exercises that most benefit individuals with CLBP include strengthening exercises for the trunk and hips, stabilization exercises, and aerobic training. Strengthening exercises are aimed at improving muscle force production, stabilization exercises are aimed at improving specific muscle control and contraction, and aerobic training should include whole body movement designed to elevate the heart rate and improve cardiovascular and pulmonary function.^{12,16} It is suggested that no single exercise routine should be prescribed, but treatment should be tailored to the patient's preferences and irritability levels.^{4,9,12,16}

In addition to exercise based interventions, manual therapy techniques are thought to be beneficial when used in a comprehensive and individualized approach. While research suggests manual therapy alone is ineffective for long term changes in individuals with CLBP, it may be used early or in conjunction with exercise for positive effects.^{4,9,12,16} To better individualize techniques, there has been an attempt to identify those who may benefit from certain techniques. For example, a clinical prediction rule has been validated to identify those who may benefit from spinal manipulation and is as follows:^{4,8,9}

- Duration of symptoms of less than 16 days
- No symptoms distal to the knee
- Hypomobility with segmental testing
- One hip with greater than 35 degrees of internal rotation
- Fear Avoidance Beliefs Questionnaire - Work subscale (FABQ-W) score less than 19

Using this type of classification for identifying patients who are likely to respond to treatment styles, clinicians may better tailor manual interventions for early pain reduction. Lack of stratification may be in part responsible for the absence of high quality evidence supporting use of manual therapy.^{4,9}

Dry needling is an emerging and highly studied practice in the field of physical therapy.^{4,5,6,9,11,18,19,22} It is the use of a filament needle without medicine, inserted into a trigger point or painful muscle in an effort to reduce pain.^{4,5} It is considered to be safe, with a very low risk of adverse events.^{4,5} At this point in time, the effectiveness and impact dry needling has on patients is under review. Meta-Analyses exist to suggest dry needling may have a positive effect on pain and disability when compared to no treatment, sham, and other modalities such as e-stim.^{11,18,19,22} Specific to CLBP, random control trials suggest dry needling to be an effective intervention.^{4,18} As with most modalities or manual techniques, the greatest effect of dry needling exists early (within the first three days)²² and may be best used in conjunction with exercise interventions for long term outcomes.^{9,11,22}

In further effort to individualize treatment, it has been suggested to approach low back pain through a classification system designed to focus on treatment response rather than anatomical diagnosis.⁹ Delitto first introduced treatment based classification (TBC) in 1995 and this was updated by Fritz in 2007, and again by Alrwaily in 2015, who attempted to encompass cognitive and psychosocial aspects of low back pain. He also emphasized the importance of fluidity of treatment as patient presentation may change throughout their plan of care. This updated classification system attempts to categorize patients into three phases of rehabilitation with subcategories of treatment within each phase. The three phases are symptom modulation, movement control, and functional optimization. Within the symptom modulation phase, treatment styles include directional preference, manipulation/mobilization, traction, and active rest. Within the movement control phase, treatment styles include sensorimotor exercises, stabilization exercises, and flexibility exercises. Within the functional optimization phase, treatment styles include strength and conditioning exercises, work or sport specific tasks, aerobic exercises, and general fitness exercises. Alrwaily suggests likelihood of response to each treatment style under symptom modulation is greatest with directional preference, followed by manipulation/mobilization, traction, and lastly active rest.¹

Considering the prevalence of CLBP, the interaction of the hip and spine, and emerging evidence for use of dry needling by physical therapists, this case study exists to determine the acute effects of dry needling the gluteus medius on a patient with a primary complaint of low back pain.

Inclusion and exclusion criteria were set prior to the initiation of this case study, and the treating clinician determined whether or not patients met this criteria during the initial evaluation of all patients referred for a primary complaint of low back pain over the span of 3 months. Exclusion criteria was as follows: under 3 months duration, history of surgery of the low back or

hip, symptoms distal to the knee, red flags that suggested neurologic origin or involvement, unwillingness to participate or fear of needles, direct treatment to the site of interest in the past two weeks, FABQ-W score greater than 19, or mechanism of injury involving fracture, motor vehicle collision, or other direct trauma to the low back or either hip. Inclusion criteria involved lack of exclusion criteria and willingness to participate with informed consent on purpose of the case study and treatment style.

Case Description

Demographics and Subjective History

This case describes the initial three visits of a seventeen-year-old female who presented with diagnoses of Sacroiliitis and low back pain from her referring provider. She and her mother gave consent to treat and be involved in this case study. She reported an insidious onset of pain two years ago that had worsened within the last 3 months. Pain was reported to be at the level of her beltline and was bilateral but tended to be worse on her right side. She worked as a hostess and noted difficulty with tasks that involved prolonged standing, sitting, or repetitive lifting. She defined prolonged activities to be greater than twenty minutes. She denied symptoms of numbness or tingling, decreased balance or coordination of lower extremities, bowel/bladder function changes, or saddle paresthesias. She denied pain that radiated into her upper back or either lower extremity. She rated her pain on a numeric pain rating scale (NPRS) 8/10 on her right side and 6/10 on her left side,⁷ and her Oswestry disability index (ODI) score was 30%, indicating moderate disability.¹⁰ Her FABQ-W score was 12. Due to her absence of red flags and exclusion criteria, she was deemed appropriate for this case study.

Physical Exam

Following the suggestion of TBC,¹ this patient was first examined for directional preference. She had 60 degrees of flexion with no pain and 14 degrees of extension in standing until the first onset of increased pain, as measured by an inclinometer. With repetitive motions, she reported decreased pain during flexion but no change upon return to neutral posture. Conversely, she had increased pain during extension but no change in pain upon returning to neutral positioning. She exhibited no signs of centralization or peripheralization.^{1,4}

Secondly, she was examined for appropriateness of manipulation/mobilization.¹ Her symptoms were clearly greater than 16 days in duration and she had no perceived segmental hypomobility noted by the treating clinician with spring testing, which reduced the likelihood of success with manipulation.⁴ Additionally, she had increased pain at the level of her L5-S1 with central posterior to anterior (PA) mobilization, and she reported no change with resting pain following three bouts of 30 seconds of PA mobilization. For these reasons she was deemed inappropriate for the manipulation/mobilization category.

Manual traction was applied with the patient in hooklying and the patient reported no change in symptoms. Other significant findings included weakness of the gluteus medius in both hips, weakness into hip flexion of both hips, weakness of her core with leg lowering test, difficulty contracting her lumbar level multifidi, mild tenderness to palpation of both gluteus medii, positive slump test bilaterally with reproduction of concordant pain, and aberrant motion during single leg stance.¹⁷ Her right gluteus medius manual muscle test was rated as 4-/5 and

her left was rated 4/5. Her right hip flexion manual muscle test was rated as 4-/5 and her left was 4/5. Her leg lower test was 3/5. Her right single leg stance time was 18 seconds and her left was 30 seconds. Of note, all bilateral weaknesses and aberrant motions had deficits greater on the right compared to left: her more painful side.

Following her examination, she was placed into the classification for symptom modulation with active rest. She also presented with deficits consistent with movement control impairments.

Interventions

Day one intervention included education on the relationship between low back pain and the hip, along with dry needling to both gluteus medii. She was palpated for areas of tenderness or trigger points along the superior fibers. Three .30x50mm needles were inserted into each gluteus medius in a side lying position. Needles were left in situ for three minutes each. The patient was educated to monitor symptoms and report back three days later for her next appointment.

On day two, the patient reported minimal change in pain with a pain rating of 7/10 for her right side and 6/10 for her left side. Objective measures were not assessed on her second visit. She received dry needling within the same protocol as her first day. She was also instructed in trunk motor control exercises and sciatic nerve glides outlined in **Table 1** so as not to deny treatment in the clinical setting. She was not instructed in exercises involving strengthening of the hip in an attempt to isolate effects of dry needling.

Outcomes

On her third day of treatment, objective measures were retested. She reported her right sided low back pain as a 6/10 and her left sided pain as a 5/10. Her ODI score was 26% from 30% at her initial evaluation. Her pain free standing lumbar extension was 18 degrees from 14 degrees. She was rated as 4+/5 bilaterally for hip abduction, from 4-/5 on her right side and 4/5 on her left side. Her single leg stance time was 30 seconds bilaterally, an improvement of 12 seconds on her right side.

Discussion

This case report set out to determine the effectiveness of dry needling the gluteus medius for individuals with a primary complaint of low back pain. Considering the current body of literature, this was not expected as a standalone intervention to be more effective than a multimodal approach, but rather as an option to facilitate short term pain relief. This patient did have a reduction in her numeric pain score, greater on her right side. She also had improved manual muscle testing as perceived by the treating clinician and improved single leg stance time. She had some change in ODI score but did not meet the minimally clinically important difference of 10%.¹⁰

These results suggest that dry needling for the gluteus medius may be beneficial for pain reduction in patients with CLBP. They also suggest dry needling may be beneficial in increasing muscle activation based on the improvement in muscle strength testing and single

leg stance time. These results are consistent with current literature that suggests passive modalities should not be used as a standalone intervention. Rather, manual therapy techniques may be used for pain modulation, but active interventions should be used for long term effects on pain, disability, and function.^{1,2,4,9,12,16} This patient was later progressed with core stabilization exercises and hip strengthening, to include quadruped and resisted exercises for the trunk and hips. Sciatic nerve mobilizations were added to her home exercise program¹⁶ following the retest of objective measures on visit three but that is beyond the scope of this case study.

Limitations

This case study had several limitations. As there was no control to compare to, it is difficult to attribute changes in objective measures to dry needling interventions. Additionally, active exercises were initiated on day 2 of treatment, further complicating attribution of success to dry needling. This was, however, necessary as this case study was conducted in a clinical setting. It may also be said that two days of dry needling were not enough to determine the effectiveness of this intervention. Ideally this case study will inspire further investigation into the potential benefits of dry needling for the gluteus medius in patients with a primary complaint of low back pain.

Table 1

Exercises fall under the category of stabilization/motor control and flexibility as outlined by Owens, et al.¹⁶

Intervention	Transverse Abdominis Sets Figure 1	Multifidus Sets with arm raise Figure 2	Glute Sets Figure 3	Physioball Push-Down Figure 4	Sciatic nerve floss Figures 5 and 6
Description	The patient is instructed to self palpate their transverse abdominis in hooklying. They are instructed to contract this muscle and hold for two seconds each repetition.	The patient is prone. Their multifidus is palpated and the patient is instructed to contract unilaterally. They raise their contralateral arm to facilitate activation	The patient is instructed to self palpate their gluteus maximus in hooklying. They are instructed to contract bilaterally and hold for two seconds each repetition.	The patient is standing with a physioball placed in front of them with the top at the height of their diaphragm. They are instructed to push down until they feel a contraction in their anterior core and hold each repetition for two seconds.	The patient is hooklying. She was instructed to bring one hip to 90 degrees. As the patient extends that knee, she plantar flexes that ankle so that the toe is always pointed toward the ceiling. She was instructed to stop at onset of symptoms. No holds performed for this exercise.
Parameters	2 sets of 10	2 sets of 10	2 sets of 10	2 sets of 10	2 sets of 10

Figure 1



Figure 2



Figure 3

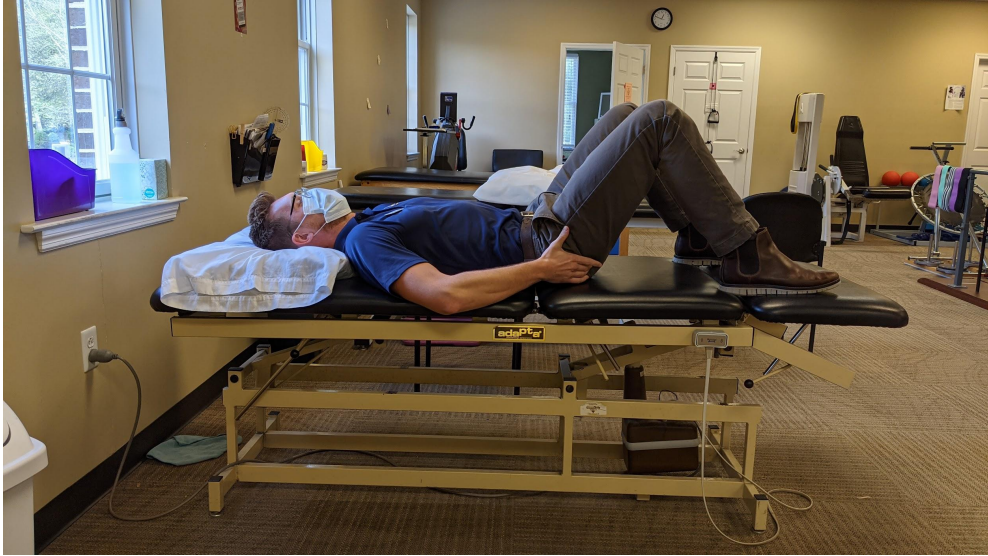


Figure 4



Figure 5



Figure 6



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