A Multi-Modal Approach to Lower Back Pain: Marrying Established Fascial Connections, Autogenic Inhibition, and Corrective Exercise

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ABSTRACT
Persistent low back pain (LBP) can function as a significant inhibitor of development in competitive sport, particularly when influenced by factors of biomechanics and diminished proprioceptive awareness. This can serve as a source of incredible frustration and discouragement to a young athlete.

A 27 year-old female CrossFit athlete with persistent unilateral LBP presented with hypertonicity and apparent overdevelopment of the lumbar erector spinae contralateral to the affected side. She complained of pain prohibitive enough (8 out of 10 on the Numerical Pain Rating Scale [2] during movement) to exclude her from participating in movements common to the sport. Previous therapies applied to the lumbar erector spinae bilaterally were unsuccessful in pain abatement. She was assessed manually along the structures of the deep front line (DFL) [1], and was discovered to have a psoas minor on the affected side, which shares a fascial connection with the pectinius [1]. The psoas minor and pectinius were found to be hypertrophic and facilitated, resulting in a posterior shift of the innominate and internal rotation of the femur. A treatment model was developed to provide release of the psoas minor and pectinius via manual therapy, and autogenic inhibition by way of multidirectional resistance to the hip joint. The subject was also given two resistance-based corrective exercises to complete outside of the clinic with the intention of bringing the innominate into a neutral position.

Major improvements included the decreased tonicity of the lumbar erector spinae and pectinius, the position of the pelvic innominate, and a lower rating on the Numerical Pain Rating Scale. The subject reported near-complete pain abatement with movement (1 out of 10) following treatment.

I speculate that the application of a multi-modal approach in the present case may be a viable option for other carefully selected cases of athletes with LBP.

INTRODUCTION
AL is a 27 year-old female athlete who presented with persistent idiopathic lower back pain on her right (R) side, which was exacerbated by movements involving pulling heavy weight from the ground. The lumbar erectors on her left (L) side appeared visibly more developed, and she complained of reduced ability to “feel” during physical activity on her painful R side. AL attempted various interventions in isolation to no avail, including chiropractic adjustment, stretching, and massage therapy. What could be done to simultaneously reduce pain and increase proprioception on the affected side without requiring her to quit her sport? Would a multi-pronged approach, which included the exploration of specific established fascial connections, yield better results?
HISTORY
AL is a 27 year-old female CrossFit athlete who was previously a competitive long distance runner during her high school and college years. She had previously suffered from headaches and neck pain during her running career, but her R side lower back pain began after starting CrossFit – a high intensity interval training model which incorporates elements from basic gymnastics, Olympic weightlifting, track and field, and plyometric training. AL is a motivated and talented athlete who is partially defined by her physical fitness and capacity. She previously attempted various interventions to alleviate pain levels, including chiropractic adjustments, general stretching, self myofascial release with foam rollers and lacrosse balls, and deep tissue massage.

METHODS
Treatment was completed over a five-week period, with AL attending three sessions per week, and each session lasting fifteen minutes. Sessions were assessed for efficacy using the Numerical Pain Rating Scale [2] at the conclusion of treatment. AL rated her starting pain as an 8 out of 10 following provocative movements such as pulling weight from the floor. Patient report and visual observation of motor patterning under load was also used to monitor apparent engagement and increase in proprioceptive awareness in the affected side.

In the initial session, AL was observed to have a posterior shift of the R innominate and internal rotation of the R femur, evident during postural analysis, palpation and movement assessments. Manual treatment, using a tack-and-stretch approach, was applied to the R iliacus and psoas junction deep to the inguinal ligament and to the R quadratus lumborum and erector spine junction. The therapist’s treating hand found the septa of the tissue while the other hand was used to passively move the joint around several randomized vectors.

Autogenic inhibition, wherein the patient is asked to meet the resistance of the therapist in a specific position with the intention of creating a sudden relaxation of the muscle upon introduction of high tension, was taught to AL during this first session. With AL laying supine and her R knee in flexion, she was asked to resist pressure at four points: at the tibial tuberosity, superior to the patella, medially at the joint line of the knee, and laterally at the joint line of the knee. Resistance was held for three seconds at each location (one circuit), and the circuit was then repeated five times. We found this was the threshold for AL wherein she was still able to provide some resistance and feel that she was engaging in the last circuit but was reaching prohibitive levels of fatigue.

Sessions two and three followed the above model exactly. With limited improvement in pain abatement, dropping only to a 7 out of 10 after both appointments, session four saw the inclusion of two pieces of corrective exercise as homework.
The first corrective involved lying supine, with the unaffected side against a wall and both knees flexed. AL was asked to wrap a medium rubber exercise band (providing sixty-five pounds of resistance) around her knees twice and posteriorly tilt her pelvis, thus providing activation of the targeted psoas. She was then asked to abduct against the band with what she perceived to be seventy percent of her maximum capacity and hold for two seconds, then return to the starting position. This was repeated for a set of twenty-five repetitions.

The second corrective exercise involved the same starting position – supine with the unaffected side against the wall, both knees flexed, and pelvis in posterior tilt. This time, AL was asked to hold a high-density foam roller between her knees and adduct with what she perceived to be seventy percent of her maximum capacity and hold for two seconds, then return to the starting position. This was also repeated for a set of twenty-five repetitions.

AL was instructed to complete these correctives following each session of manual therapy. She maintained compliance throughout the remainder of the fifteen sessions. Following sessions four and five, pain levels dropped to a 5 out of 10, and the force she could generate in both abduction and adduction increased, according to patient report.

Dissatisfied that AL’s pain had not been resolved more effectively, the search began for possible fascial connections that may have previously been overlooked. Having already explored the iliacus and psoas connection and the quadratus lumborum and erector spinae connection outlined in Anatomy Trains, it was noted that there was a link between the psoas minor and the pectinius via the lacunar ligament [1]. This region would have been missed entirely during treatment of the psoas and iliacus junction, as that work was concentrated more laterally in the body.

In session six, manual treatment on the R side was concentrated more medially to affect the belly and tendon of psoas minor, and ran far more superiorly than in previous efforts. Manual treatment to the pectinius was also included, with special focus being given in the area of the lacunar ligament. The same vector work was applied for the purpose of release, followed by the same autogenic inhibition and corrective exercises.

RESULTS
Sessions one through three saw AL’s pain drop from an 8 out of 10 to a 7 out of 10 on the Numerical Pain Rating Scale [2]. After adapting the corrective exercises, sessions four and five decreased pain to a 5 out of 10. Following a research review and the discovered presence of a psoas minor in AL’s affected side, sessions six through fifteen saw a significant drop in pain, ending the final session at a 1 out of 10. Corrective exercises were maintained throughout, as was the application of autogenic inhibition.
Decreasing trend of pain as sessions increased; better results following the introduction of correctives in Session 4 and psoas minor/pectinius treatment in Session 6.

AL’s apparent imbalance between the left and right erector spinae resolved and the tonicity of the left side was diminished at the time of session fifteen, the final appointment. The posteriorly shifted right pelvic innominate had also returned to a neutral position relative to the right femur upon reevaluation at the time of the final session. She reported feeling much more “grounded” in her newly pain-free R side, which allowed her to pull from the floor with observably even recruitment than she was able to generate prior to the start of treatment.

AL, before and after Session 6
CONCLUSIONS
AL’s lower back pain was prohibitive enough prior to treatment that she began to think about leaving the sport of CrossFit. She tried multiple modalities in isolation to relieve her pain; none of these worked long-term to allow her to move without discomfort. A multi-modal approach, which included the use of established fascial connections, autogenic inhibition, and corrective exercise in tandem, assisted in bringing AL from an 8 out of 10 to a 1 out of 10 during heavy pulling movements. The combination of these elements not only significantly reduced pain; they were also responsible for neutralizing the position of the R pelvic innominate and for increasing proprioceptive awareness and muscular recruitment on the R side.

AL has continued to attend CrossFit classes with minimal pain by keeping up with the assigned corrective exercises and returning to the clinic for maintenance visits as needed. Further research is required to determine the extent to which proprioception has been returned to the affected side of the body.

REFERENCES