Clinical Case Report Competition

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First Place Winner

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Enigmatic sacroiliac joint/low back pain: A massage therapy treatment approach to a multifactor problem
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Abstract

Enigmatic Sacroiliac Joint/Low Back Pain: A Massage Therapy Treatment Approach to a Multifactor Problem

By Kathryn E. Hodgson

Background. This case study investigated and treated multifactor causes of pain in the right sacroiliac joint (SIJ)/low back region of a 27 year-old female yoga instructor and full-time student.

Methods. Postural and soft tissue evaluations were completed combined with a variety of low back and SIJ orthopedic tests to focus the treatments and case management plan. General Swedish Massage (GSM) techniques, muscle energy techniques (MET), trigger point pressure release (TPPR), and myofascial release (MFR), combined with appropriate home care exercises and adjustment to sleeping positions were employed.

Results. MET, TPPR, and MFR were all found to be effective in providing relief of symptoms. Adjustments to sleeping postures and the incorporation of core stabilization exercises into the patient’s yoga practice were also found to be a necessary component of the case management plan.

Conclusion. Massage therapy is an effective intervention for the treatment of LBP and SIJ pain and dysfunction. Limitations to the study, including further assessment and potential treatment of a left foot pronation are discussed, as are directions for future treatment.

Key Words. SIJ, LBP, muscle energy, trigger point, multifaceted treatment, yoga, sleeping positions, core stabilization
Enigmatic Sacroiliac Joint/Low Back Pain:   
A Massage Therapy Treatment Approach to a Multifactor Problem  

Introduction  

Seemingly enigmatic, chronic sacroiliac joint (SIJ) and low back pain (LBP) can be frustrating for both practitioner and patient alike as they seek to discover and treat the cause(s) and source(s) of the pain. The elusory source(s) of the pain are understandable given the nature of the physiological structures and connections within and between the low back, more specifically the lumbar spine, and the SIJ. In fact, it is a common understanding amongst many health practitioners and exercise physiologists that SIJ dysfunction can be the cause of LBP and that low back dysfunction can refer pain to the SIJ region (Cohen, 2005; Hertling & Kessler, 2006; Kisner & Colby, 2012; Magee, 2008; McGill, 2002; Simons, Travell & Simons, 1999; Vining, Potocki, Seidman, & Morgenthal, 2013). Therefore, when treating a patient who complains of pain in the SIJ region, it behoves the therapist to fully assess all possible musculoskeletal structures in and around both the SIJ and the lumbar spine. Moreover, the therapist must seek to determine the cause(s) of the dysfunctional lesion (i.e., the patient’s postural habits, their activities, or any suffered trauma). Doing so ensures the therapist focuses the treatment and case management plans to provide the patient with long-term pain relief and prevention (Magee, 2008). In essence, a comprehensive assessment of the lumbar spine/SIJ and associated kinesiology in each individual patient with specific regard to their daily movement and postural habits will assist in revealing the seemingly enigmatic cause(s) and source(s) of the pain and thus allow for effective treatment and prevention.  

The SIJ is commonly understood to be a mobile diarthrodial joint with small amounts of movement in three degrees of freedom (Houglum & Bertoti, 2012). As depicted in Figure 1, the
SIJ is the junction of the medial iliac portion of the inominate bone and the lateral wing of the sacrum. It is stabilized by a very intricate set of ligamentous structures with the ultimate purpose of limiting the available movement in all planes (Choen, 2005), with adjacent muscles (i.e., the quadratus lumborum, gluteus maximus, gluteus minimus, iliacus, latissimus dorsi, and piriformis) contributing to the joint’s stability through their fibrous expansions that blend with both the anterior and posterior sacroiliac (SI) ligaments (Hertling & Kessler, 2006). The iliolumbar ligament extends from the posterior iliac crest to the transverse process (see Figure 2) of the fifth lumbar vertebrae (L5), and sometimes to the fourth lumbar vertebrae (L4): It plays a pivotal role in properly aligning the L5 vertebrae on the sacrum (Hertling & Kessler, 2006) and stabilizing L5 in relation to the ilium (Magee, 2008). Injuries such as strains, hypermobility, and

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hypomobility of any of these ligaments are considered by many practitioners as primary sources of low back pain (Houglum & Bertoti, 2012), with the iliolumbar ligament being a frequent source of pain when there is true SI dysfunction (Hertling & Kessler, 2006).

In addition to the intricate ligamentous system of the SIJ that blends with adjacent lumbar vertebra and musculature, the SIJ itself can be a source of local or referred pain if it is dysfunctional (Magee, 2008; McGill, 2002). The SIJ gains some of its strength and stability through the marriage of the two irregular shaped articular surfaces, each covered with different types of cartilage: The convex medial surface of the ilium is covered in fibrocartilage and the concave lateral surface of the sacrum is covered in hyaline cartilage. This rough and intricate complexity works well if the surfaces are married perfectly. However, if there is acute trauma or chronic stress placed on the joint, the result may be one or more several joint dysfunctions, which can then cause pain within the joint itself. It may even cause pain in surrounding tissues (e.g., ligaments, muscles, joint capsules) as they work, abnormally so, to compensate for the altered SIJ function.

SIJ dysfunction and associated pain in the joint or surrounding tissues can manifest in several different ways and to understand these manifestations, it is important to first appreciate the osteokinematics of the joint. The SIJ is connected to both the axial skeleton through the lumbar vertebrae and to the lower extremity through the ilium with both gravitational and ground forces transmitting through the joint, mostly in opposition to each other. When force is transmitted through the joint from the lower extremity, as in a heel strike in walking or contraction of lower extremity muscles that originate on the part of the pelvis (the structure comprised of the innominate and sacrum), the ilium is said to be moving on the sacrum (i.e., iliosacral movement). Whereas when force is transmitted via the lumbar spine, as in bending
forward to pick a pen up off the floor or contraction of axial muscles inserting onto or through the pelvis, the sacrum is said to be moving on the ilium (i.e., sacroiliac movement) (Hertling and Kessler, 2006; Houlgum and Bertoti, 2012; Magee, 2008). These forces generally act in balance in unique motions known as nutation and counternutation (Houlgrum and Bertoti, 2012).

In nutation, the base of the sacrum nods anteriorly and inferiorly while the ilia move to see the posterior superior iliac spine (PSIS) approximate and the anterior superior iliac spines (ASIS) and ischial tuberosities move apart (Hertling and Kessler, 2006), creating a sacral locking. The opposite occurs in counternutation, or sacral unlocking. Nutation or counternutation occurs bilaterally and simultaneously in both SIJs when, with both lower extremities fixed, the lumbar spine flexes forward (i.e., nutation) or extends backward (i.e., counternutation). Nutation and counternutation also occurs simultaneously and contralaterally during oppositional lower extremity movement, such as walking or running.

Ideally, at rest and with forces equally balanced, the pelvis would be in a neutral position, in neither a state of nutation nor counternutation. In a neutral pelvis, both PSISs are level with each other, both ASISs are level with each other, and the pelvic tilt angle (i.e., angle between line ASIS and PSIS and a horizontal line from a side view) is 11°, ± 4° (Magee, 2008), and equal on both sides. In ideal movement patterns, the ilium translates freely and smoothly in relation to the sacrum and vice versa. In a non-neutral pelvis, abnormal and restricted joint movement may occur, and when movement patterns are altered, a non-neutral pelvis may be the end result. In either case, pain within the SIJ and/or surrounding compensating tissues and structures is the likely consequence. Further examination of the SIJ osteokinematics is beyond the scope of this paper. However, given the different forces acting upon the joint from both the axial body and lower extremities, combined with the joint’s three degrees of freedom, it is suffice to say that in
most all daily activities, iliosacral/sacroiliac movements are both multifaceted and compound. Moreover, if the forces and movements are imbalanced, the end result could be one of many possible dysfunctions (e.g., anterior or posterior rotated innominate, lumbar hyperlordosis or hypolordosis, functional shorter leg, limping gait, functional spinal scoliosis, muscular imbalances) (Magee, 2006). Alternatively, the dysfunctions could cause imbalances in the forces of movement.

Given that SIJ is the focal and pivotal point of force transmission and movement initiation between the axial body and the lower extremity, it stands to reason that any SIJ dysfunction can result in dysfunction and pain in the lower back region. Indeed, McGill (2002) cited Schwarzer and colleagues as having been able to diagnose 12% of lower back pain (LBP) cases as attributable to sacroiliac pain. Moreover, LBP can be attributed to many different variables including biomechanical and psychosocial factors (McGill, 2002). For the purpose of this study however, the focus remained upon musculoskeletal factors that refer pain from the low back to the SIJ and from the SIJ to the low back region.

Compressed articular facet joints in the lower lumbar vertebrae can be painful in and of themselves as the intra-articular synovial fluid presses against the confining facet capsule, which then becomes stretched and irritated (Steiner, C., 1994). The pain of facet joint irritation is often referred to the low back/buttock area (Magee, 2008; McGill, 2002). This may be due to a sequence of cascading events that can work in either direction from a muscular strain/ligamentous sprain that causes muscles to protectively contract, spasm, and remain in a painful hypertoned state. The consequence of the muscular hypertension could be a limitation on the free movement of associated boney structures, ultimately resulting in facet joint irritation as
the compensating structures attempt to counteract the imbalance (Steiner, 1994): The opposite could also be true (Janda, 1988).

The concept of the opposite being true (i.e., joint dysfunction causing muscular pain) in the low back region can be demonstrated through the functioning of the deep paraspinal muscles, rotatores and multifidi. Lumbar and sacral rotatores and multifidi are known sources of LBP (Simons, Travell, & Simons, 1999) and in fact, classic pain referral patterns of these two muscle groups in the lumbar region can result in both low back and SIJ area pain (Figure 3). Given their role for fine adjustments/stabilization between vertebrae (Hertling & Kessler, 2006; Houglum & Bertoti, 2012), it stands to reason that if the lumbral vertebrae malfunction in relation to each other, regional rotatores and multifidi can become strained and possibly develop myofascial trigger points (TrPs) in an attempt to properly articulate the dysfunctional joints (Simons, Travell, & Simons, 1999).

Figure 3. Multifidi trigger point pain referral patterns. A, example of referral pattern at low sacral level (S4). B, local and projected pain patterns at lumbar (L2) and higher sacral levels (S1).

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Regardless of the original source of the LBP or SIJ pain, be it a strained muscle or malfunctioning joint due to acute or insidious trauma, either source can subsequently cause pain and dysfunction in the other. Whichever way, restoration of normal muscle tone and musculoskeletal motion is the ultimate goal in the relief of LBP and SIJ pain (Chaitow, 2013), and in the process of achieving this goal, resolving and alleviating all sources of pain be they muscular, joint, or connective tissue in nature.

If it is assessed that more than one structure may be or has become involved in the cause of LBP and SIJ pain, it is essential to address all negatively affected secondary structures regardless of the original source of the pain. To do otherwise could leave the affected secondary structures in a dysfunctional state which, painful as they may be themselves, could also commence another cascade of events leading to a relapse of the original source of the pain or perhaps even a new dysfunction in a different structure that was not originally affected. As such, a multi-faceted approach in employing different treatment modalities relating to each specific structure should be employed by the therapist to ensure holistic and thorough care of the patient’s problem.

*Case Study Overview and Case Management Goals*

Faced with the complex task of parsing out and holistically treating all confounding factors that can contribute to LBP and SIJ pain, the objective of this case study was to determine and resolve the root cause of the self-described SIJ pain suffered by a young, otherwise healthy, female yoga instructor and full-time student so as to allow her to continue lifelong yoga practice and instruction safely and pain free.
Method

Client Profile

A 27-year old female with an ectomorphic morphology presented with a chronic yet intermittent “twingey” pain and instability in the right SIJ area as her only complaint. As a current full-time Registered Massage Therapy student, previous body-work practitioner of four years, and a yoga practitioner (23 years) and yoga instructor for over eight years, she was able to well-articulate her pain and restrictive sensations. She reported no family history of degenerative joint or arthritic conditions, no limitations on her activities of daily living due to the pain, and sound and comfortable sleep patterns. She received a Rolfing treatment for the pain within one year prior to her presentation at the clinic but she could not give a specific date for that treatment nor did she feel anything but temporary relief from the pain as a result of that one treatment. Also, one week prior to her initial assessment at the clinic, she received a chiropractic adjustment to the right SIJ and reported feeling no pain since that high velocity thrust adjustment. However, she felt that the one chiropractic treatment would only be a temporary fix to the chronic issue and she was eager, through massage therapy rather than chiropractic care, to determine and address the root cause of the pain. She believed that the issue was muscular in nature due to what she thought to be a “stuck SIJ”. The patient reported receiving no other healthcare specifically for this issue. However, during treatment 2, the patient experienced a flashback of her childhood years when she received a series of vitamin B12 intramuscular injections into her right gluteus medius (glute med) area. She related the experiences as extremely painful and emotionally traumatic.

The patient described herself as normally living a very active lifestyle including cycling, kayaking, walking, hiking, and daily yoga practice but that these activities had waned since the
commencement of full-time studies one year previous, and that she had not conducted a daily yoga practice in quite some time. With decreased activity levels, she said that the pain was more frequent than it had been prior to commencing her college program. She also felt that living the relatively sedentary student lifestyle (i.e., sitting in class all day, slumped over books) was not healthy for her lumbar spine and that it could possibly be exacerbating the pain in the right SIJ area. She stated that in the past she could prevent the pain from occurring with strong core muscle stabilization and that if she was not conscious of engaging her core musculature, the pain would appear. She mostly felt the pain and instability when performing the yoga triangle posture (see Figure 4) with her left foot forward and that she could also reproduce the pain with standing left lateral lumbar flexion with her right arm extended overhead.

Assessment

An observational assessment of the patient’s normal standing posture (Magee, 2008) was completed, along with the following orthopedic assessments described by Magee (2008): Quadrant test for the lumbar spine facet joint irritation (in both neutral and with compression); Gillet’s and Anterior Ipsilateral Rotation tests for hypomobile SIJ; Yeoman’s test for anterior SI

*From “Six gentle ways to cure your anxiety with yoga”, by M. Trantina, 2013. Copyright 2013 by Chatelaine.*
ligament pathology, lumbar spine involvement, or femoral nerve involvement; Gapping test for anterior SI ligament pathology; Squish test for posterior SI ligament pathology; FABER test for SI joint involvement &/or iliopsoas tightness/spasm; and, Stork test to determine any instability in SIJ and strength of glute med muscle (i.e., Trendelenburg’s sign). Observations were made regarding the relative positions of the PSIS and ASISs and bilateral pelvic tilt angles. Additionally, palpation of surrounding soft tissue was conducted to determine texture, tone, tenderness and temperature. Manual muscle strength tests (as described by Hertling & Kessler, 2006 and Magee, 2008) were also performed on bilateral quadratus lumborum (QL), gluteus maximus (glute max), and glute med using a grading system of 0-5 (Magee, 2008) with the values represented in Table 1.

Table 1
Muscle Test Grading

<table>
<thead>
<tr>
<th>Numerical Grade</th>
<th>Qualitative Movement Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>complete range of motion against gravity with maximal resistance</td>
</tr>
<tr>
<td>4</td>
<td>complete range of motion against gravity with some resistance</td>
</tr>
<tr>
<td>3</td>
<td>complete range of motion against gravity</td>
</tr>
<tr>
<td>2</td>
<td>complete range of motion with gravity eliminated</td>
</tr>
<tr>
<td>1</td>
<td>slight contraction</td>
</tr>
<tr>
<td>0</td>
<td>no traction</td>
</tr>
</tbody>
</table>

Bilateral hip joints were tested for both active and passive range of motion and compared against Magee’s (2008) listed average ranges. Finally in the initial assessment, the patient was asked to perform the yoga triangle posture bilaterally to compare the limitation due to the pain and feeling of instability in the right SIJ. Observational measurements of the range of motion for this yoga posture were initially judged in a percentage, but commencing in treatment 8, a more
objective assessment was taken bilaterally by measuring a vertical line from the ASIS to the
ground. During all of these tests, the patient was asked to describe any elicited pain on a 10-point
scale, with 0 being no pain and 10 being the worst pain they have ever experienced.

At the beginning of each individual treatment, the patient was asked to describe how she
felt following her previous treatment with specific regard to any improvement or deterioration in
symptoms and her ability to perform her problematic yoga posture. As the treatments progressed,
some of the tests were repeated to determine progress and the following additional tests were
inserted as the therapist gained further clarity and insight to the potential root cause: Hip
Extension (Herling & Kessler, 2006) to determine abnormal muscular firing pattern of hip
extension; Seated Forward Flexion Test (Chaitow, 2013) testing for hypomobility of the sacrum
being stuck on the ilia; Thomas Test for tight iliopsoas and quadriceps muscles (Magee, 2008);
Seated Forward Flexion Test for movement/restriction in L4 and L5 facet joints (Chaitow, 2013);
and Standing Lateral Flexion Test (Magee, 2008) using a tape measure to determine distance
from middle finger, of the side of the body to which the spine is laterally flexed, to the floor.

Prior to the commencement of treatment 11, the patient revealed that although she sleeps soundly
and comfortably, it may be in an “awkward” position. A photograph was taken of her
demonstrating this sleeping position (see Figure 5).

Figure 5. Case study patient demonstrating her sleeping position.5

5Photograph by Kathryn Hodgson
Treatment

Fifteen 70-minute massage therapy treatments were provided over the course of 11 weeks. Treatments 1 and 15 were primarily focused on assessment. All other treatments concentrated on the primary issue except for treatment 14, when the patient was feeling extremely tired with cold-like symptoms including congested lungs and pain in the left posterior thoracic rib area. During this treatment, the focus was shifted appropriately to address the patient’s primary needs at that time. In treatments 2-4; general Swedish massage (GSM) techniques were applied to the entire back, with focus on the right erector spinae (ES) muscles of the mid-thoracic and lumbar regions and right gluteal/sacral region upon which cross-fibre frictions were applied; myofascial release techniques including skin rolling, bear claw, cross-hand shearing, v and j stroking, and sacral float were all applied over the right SI/iliac crest/lower lumbar and gluteal regions. From treatment 3 onwards, hydrotherapy in the form of moist heat (either hydrocollator or Thermaphore) was applied to the low back and gluteal regions for 5-10 minutes. In treatment 5, contract relax techniques on glute max and glute med were added to the treatment as well as trigger point pressure release (TPPR) to the right QL. In treatment 6, 7, 11, 12, and 13 generally lengthening GSM techniques were added to the left lumbar/QL region and then MET was added to the left L4/L5 facet joint. Treatments 7, 8, 9, 10, 11, 12, 13 included deep slow muscle stripping to the right ES and deep paraspinal muscles in the right lamina groove, especially to the right lumbar/sacral multifidi. In treatment 8, TPPR to the right longissimus thoracis and in treatment 13, TPPR was added to the right sacral multifidi.

Reassessment

Reassessment included all original observational, palpation, manual muscle, hip range of motion, functional movement, and special orthopedic test that were conducted in the initial (and
inserted) assessment phase. The patient was asked what, if any, value she had received from the massage therapy treatments, if there had been any change to the pain quality, and if she felt any improvement in her ability to perform the yoga triangle posture.

**Homecare**

The patient was initially prescribed strengthening exercises for her glute med in three sets of 10 repetitions to perform daily without pain (Kisner & Colby, 2012). As the treatments proceeded, glute max strengthening exercises were added to the routine with similar duration, frequency, and intensity. Following any treatment that contained cross-fibre frictions, the patient was instructed to apply ice to the area to a maximum of 10 minutes or a feeling of numbness, whichever came first. After treatment 5 and on her own volition, the patient discontinued the prescribed gluteal strengthening exercises and instead commenced a routine of yoga postures designed to improve spinal health (Sergeant, 2013) that she continued to do for at least 3-4 times per week for the remainder of the treatment period. From treatment 6 onwards, the patient was advised to include Feldenkrais pelvic clock exercises (Frye, 2008) in addition to the yoga for spinal health routine, and from treatment 11 onwards, a left QL stretch was also added. Finally, from treatment 11 onwards, the patient was advised to change her sleeping posture to a more neutral position (i.e., on back with pillow under knees or side lying with one pillow between her knees and another in between her arms and pressed against her chest as in hugging the pillow).

**Results**

At the beginning of treatment, the patient reported a chronic yet intermittent “twingey” pain of 3/10 on the 0-10 point pain scale in the right SIJ area. She also associated this pain with a feeling of instability in the right SIJ, especially when performing the triangle yoga posture (Figure 4) with her left foot forward. When compared to the 100% range of motion and no pain
Enigmatic Sacroiliac Joint/Low Back Pain

in triangle posture with her right foot forward, the patient started treatment with 80% range of motion in the triangle posture (left foot forward), apprehension in proceeding into the full expression of the posture due to a sense of instability in the right SIJ, and an increased level of pain in the right SI area when returning to a neutral standing position. By treatment 6, her range of motion with her left foot forward had improved to 100% with no pain or apprehension reported. At treatment 8, measurement of the range of motion in triangle posture was altered to a more objective and precise assessment by measuring the distance of a vertical line from the ASIS to the ground. At the beginning of treatment 8, with her right foot forward, the distance from her left ASIS to the ground was 77.5 cm and with her left foot forward, the distance from her right ASIS to the ground was 75 cm. By treatment 15, these measurements were equal at 77 cm bilaterally and her pain sensation in the right SI area was “slight: nothing like it was before”.

Initial standing postural observation revealed a difference in shoulder height with the right side being slightly lower than the left from both anterior and posterior views. Her right ASIS was slightly higher than her left and her right PSIS was slightly lower than her left PSIS. Here pelvic tilt angle on the right side was less than that of the left. She also had a slightly anteriorly rotated left shoulder and a slightly flattened longitudinal arch on her left foot. On palpation assessment of affected musculature and soft tissue, her right ES were hypertoned in comparison to her left ES and she experienced a pain of 3/10 upon palpation of her right sacral multifidi area. On reassessment, all postural inequities and asymmetries had evened out, her left shoulder was no longer anteriorly rotated and her right ES was still more hypertoned than her left side but the differences between the right and left ES were so small, they were hard to detect. She experienced no tenderness on palpation of the right sacral multifidi area. However, her left foot longitudinal arch remained flatter than that of her right foot. During treatment 2, fibrous,
thick and tender myofascial tissue was palpated in the right glute med and upon reassessment, the tissue felt normal and was non-tender. She demonstrated full bilateral hip range of motion, passive and active, upon assessment and reassessment. All results of pre and post treatment orthopedic tests are listed in Table 2.

Table 2

<table>
<thead>
<tr>
<th>Test/Observation</th>
<th>Assessment</th>
<th>Pain (0-10)</th>
<th>Reassessment</th>
<th>Pain (0-10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lumbar Spine Quadrant</td>
<td>neg. Bi</td>
<td>0</td>
<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>2. Gillet’s</td>
<td>neg. Bi</td>
<td>0</td>
<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>3. Anterior Ipsilateral Rotation</td>
<td>neg. Bi</td>
<td>0</td>
<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>4. Yoeman’s</td>
<td>neg. Bi</td>
<td>0</td>
<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>5. Gapping</td>
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<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>Squish</td>
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<td>neg. Bi</td>
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<tr>
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<td>0</td>
<td>neg. Bi</td>
<td>0</td>
</tr>
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<td>Stork</td>
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<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>Standing Left Lateral Flexion</td>
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<td>0</td>
</tr>
<tr>
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<td>44 cm</td>
<td>0</td>
</tr>
<tr>
<td>Thomas</td>
<td>pos. L neg. R</td>
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<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>Seated Forward Flexion (Sacral Fixation)</td>
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<td>neg. Bi</td>
<td>0</td>
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<tr>
<td>Hip Extension – Right</td>
<td>hamstrings,</td>
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<tr>
<td></td>
<td>ipsilateral ES,</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>contralateral ES,</td>
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<tr>
<td></td>
<td>gluteus max</td>
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<td>Hip Extension – Left</td>
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<td>0</td>
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<tr>
<td></td>
<td>ipsilateral ES,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>contralateral ES,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>gluteus max</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seated Forward Flexion (L5/S1 facet joint)</td>
<td>pos. L neg. R</td>
<td>0</td>
<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>Seated Forward Flexion (L4/L5 facet joint)</td>
<td>pos. L neg. R</td>
<td>0</td>
<td>neg. Bi</td>
<td>0</td>
</tr>
<tr>
<td>QL muscle test</td>
<td>5/5 Bi</td>
<td>0</td>
<td>5/5 Bi</td>
<td>0</td>
</tr>
<tr>
<td>Glute max muscle test</td>
<td>5/5 Bi</td>
<td>0</td>
<td>5/5 Bi</td>
<td>0</td>
</tr>
<tr>
<td>Glute med muscle test</td>
<td>4.5/5 L, 3.5/5 R</td>
<td>0</td>
<td>5/5 Bi</td>
<td>0</td>
</tr>
</tbody>
</table>

Note. neg. denotes negative test result while pos. denotes a positive test result. L and R refer to left and right respectively. Pain scale ranged from 0-10.
Qualitatively, the patient reported having received great value from the massage therapy treatments in that she felt a decrease in tension and restriction in her entire right low back/sacral/gluteal region, more ease and less apprehension at performing the yoga triangle posture, had a greater sense of postural awareness in both awake and sleeping states, and that she has learned what exercises to do if she feels the “twingey” sensation start to return.

Discussion

In general, therapeutic massage is well-recognized as an effective treatment for reducing or managing pain (Rattray & Ludwig, 2000). Moreover, massage therapy has been documented and accepted as a treatment for LBP (Kumar, Beaton, & Hughes, 2013) from other professionals in the medical community. However, the key to any successful treatment of pain, be it massage therapy or any other type of therapeutic intervention (e.g., drug, physiotherapy, chiropractic) is thorough and accurate assessment of the causative and associated pain factors (Magee, 2008), then appropriate selection and application of treatment modalities.

Massage therapy modalities, when chosen by the practitioner based on the involved structures, patient tolerance and preference, and combined with consistent progress evaluation, reassessment and any necessary adjustments throughout the course of the treatments pave the way for successful therapy of LBP and SIJ pain. This case study was a complex multifactor presentation of SIJ pain with many contributing confounds. Due to its multifactor nature, there was not one crucial solution and instead, tackling and resolving as many factors as possible within the allocated treatments carved the pathway towards success.

To address joint dysfunction in the lumbar and SI joints, Chaitow (2013) & Hertling & Kessler (2006) promote the use of muscle energy techniques (MET). Hertling & Kessler (2006) also state that a variety of soft tissue manipulations (i.e. massage techniques), along with
stretching and strengthening of affected muscles, is key to addressing muscular pain and imbalances and thus resetting joints’ neutral positions. Both MET and a variety of soft tissue massage techniques proved effective in this case study to address both the dysfunctional L4/L5 facet and right SIJ and the surrounding muscular spasms and imbalances.

To treat affected muscular structures presenting with TrPs, TPPR has proven successful in reducing TrPs and relieving their associated pain referral patterns (Fryer & Hodgson, 2005; Gemmell, Miller, & Nordstrom, 2008; Hidalgo-Lozano, Fernández-de-las-Peñas, Díaz-Rodriguez, González-Iglesias, Palacios-Ceña, & Arroyo-Morales, 2011; Rattray & Ludwig, 2000; Simons, Travell, & Simons). This fact proved to be true for the patient in this study as longissimus thoracis, scarcal multifidi, and QL all responded well to TPPR thereby reducing their painful referral pattern to the right SI region.

Rattray & Ludwig (2000) and Hertling & Kessler (2006) advise the use of myofascial release techniques (MFR) in cases where there may be abnormal fascial tension patterns due to “fascial shortening, adhesions or restrictions due to inflammation, trauma, surgery, pathology, or postural imbalances” (Rattray & Ludwig, 2000, p. 45) and there is evidence supporting the use of this technique in orthopedic conditions (McKenney, Elder, Elder, & Hutchins, 2013). Certainly is this case, it is possible that a major contributing factor to the patient’s sensations of pain and instability in the right SI area were caused by the scaring and emotional trauma of repeated vitamin B12 injections she received as a child in the right gluteal region. Whether or not they were the root cause from which other dysfunctions arose could not be determined. However, demonstrated clearly was that a variety of MFR methods proved extremely effectual in the low back/sacrum/right gluteal region for this particular patient as the originally palpated thick, fibrous, and tender fascial adhesions dissipated to insignificance by the end of treatment.
In addition to these direct contact massage therapy modalities, specific home care exercises prescribed by the therapist and conducted by the patient coupled with adjustments to pathology-inducing postural patterns and activities are an essential rehabilitative part of the successful therapeutic solution (Magee, 2008). Apparent from this study was the necessity for the patient to change her sleep position because no MET treatment to the L4/L5 facet joints were indicated following nights of sleeping either on her back or side. Persistence in avoiding her long-time awkward stomach sleeping position will likely prove fruitful in obviating future LBP and SIJ pain.

Also useful in LBP and SIJ pain management and prevention is an inclusion of a regular exercise routine and postural awareness in all activities, including activities completed while in seated postures, such as studying. As Hertling & Kessler (2006) point out, the SIJ becomes vulnerable to overuse and sprain when there is imbalance in the supporting musculature. In this case, right glute med and core muscular strengthening combined with symmetrical pelvic movement exercises were an integral part of the pain relief and stability creating process for this patient.

For centuries, and definitely more recently in western society, yoga instructors and practitioners have promoted regular yoga practice as a potential solution to joint stiffness, chronic tension, muscular weakness and inflexibility, and postural imbalance and asymmetry (Faulds, 2005; Kaminoff, 2007; Baptiste, 2002, Francina, 1997). Moreover, research is proving yoga as an effective tool in the management of LBP (Sorosky, Stilp, & Akuthota, 2008). As the patient in this case study recommenced a regular yoga practice that centred on building full body structural stability and symmetry to support spinal health (Sergeant, 2013), improvements in the patient’s condition were both palpable and observed by the therapist, and felt by the patient.
However, inappropriate application of yoga practice can be detrimental to connective tissue health and cause undue stress on joints (Bell, 2013). Specifically pertaining to the triangle posture, excessive force can be placed on the SIJ causing LBP (Armstrong, 2013). Furthermore, given that yoga was a part of the patient’s daily life for many years, some of the exercises and yoga postures may have been a contributing factor to the patient’s dysfunction and pain pattern. Therefore, a recommended future concentration for this patient in her yoga practice was appropriate selection and performance of specific yoga postures, with the mindful understanding that over stretching soft tissue can be damaging, create joint instability and that certain postures can cause excessive joint stress.

**Limitations, Future Assessment and Treatment**

Due to the number of confounding factors, the root cause of the SIJ pain in this case study patient remains an enigma. Nevertheless, addressing each factor, individually and as part of the kinetic chain, with massage therapy techniques, adjustments to pathological postural patterns, and patient commitment to prescribed home-care exercises proved effective and contributed to the success of the treatment. The patient’s continued commitment to appropriate exercises and postural awareness/correction in all activities, including her sleeping position, combined with future treatments to address the residual hypertonicity of the right ES musculature should contribute to the long-term maintenance of these successful results. However, one factor that was not addressed that could potentially be problematic in the future and may result a relapse in symptoms is the patient’s left foot pronation and its impact up the kinetic chain. Therefore, future assessment and treatment should incorporate left foot pronation, including the potential requirement and referral for orthotic footwear.
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Appendix

_Treatment Records_

15 of each of the following individually dated forms pertaining to each individual treatment:

a) Patient History Interview forms;

b) Physical Assessment Forms; and,

c) Treatment Reports.