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Physical Therapy Management of a Patient with a Diagnosis of SIJ Dysfunction Secondary to Double Scoliosis: A Case Report

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Abstract

Introduction: In many cases, the combination diagnoses of scoliosis, lower back pain, sacroiliac dysfunction gets overlooked in physical therapy management. With available diagnostic tools to physical therapists, it has always been a challenge to diagnose and treat the condition appropriately and manage symptoms to improve quality of life.

Case Presentation and Treatment: A patient in her mid-20's presented with mid and low back pain was managed conservatively utilizing specific mobilization/manipulation techniques, exercise regimen, home exercise program, orthotic modifications, and medications for a period of six months when patient was deemed non-surgical candidate.

Outcomes: Total of eighteen sessions of treatment was provided over the period of six months duration. The results of Numeric pain rating scale and Oswestry Disability questionnaire substantially decreased from 8/10 to 1/10 and 68% to 18% respectively.

Conclusion: Appropriate diagnosis and utilization of specific and combination of therapy to address specific dysfunction with home exercise program decreased pain and improved quality of life.

Keywords: Physical therapy; Sacroiliac dysfunction; Scoliosis; Lower back pain

Introduction

Sacroiliac joint (SIJ) dysfunction contributes to approximately 15-25% of cases of low back pain [1-4]. Although numerous studies highlight the role of SIJ management in addressing lower back pain, SIJ dysfunction is frequently overlooked in the management of scoliosis and associated lower back pain [5]. Due to lack of data on SIJ dysfunction, is often undiagnosed and may mimic sciatica by presenting as radiating pain resembling a nerve compression [5-7].

Whether the patient is symptomatic or asymptomatic, it is often difficult to accurately identify SIJ movement [8-12]. The complexity of diagnosing SIJ dysfunction stems from limited diagnostic tools, making it difficult to pinpoint the SIJ as the source of pain. Similarly, scoliosis, which affects approximately 2-3% of the population [13] , adds another layer of complexity to evaluating and managing lower back pain.

Physical therapists (PTs) face significant challenges in diagnosing and treating the combination of scoliosis and SIJ dysfunction, particularly in outpatient settings where diagnostic tools may be limited. The multifactorial nature of spinal dysfunctions and their overlapping symptoms complicates proper identification and treatment, often delaying specific interventions that address the root cause of the problem that could improve the patient's quality of life.

Case Presentation

Patient Description

The patient is a woman in her mid-20s who presented with mid and lower back pain radiating to the left gluteal region, groin, and lower extremity. She had been diagnosed with scoliosis during her teenage years and was deemed a non-surgical candidate.

Case History

Her symptoms worsened during pregnancy and became significantly more pronounced approximately 12 months postpartum. Initially, her pain was managed with ibuprofen and oxycodone for three months in the postpartum period.

At 12 months postpartum, the patient sought physical therapy for persistent thoracic and lumbar spine pain radiating to the left gluteal region, groin, and lower extremity. She described her symptoms as sharp pain with bending and lifting, intermittent dull aching pain, and disturbed sleep. Activities such as childcare and household tasks aggravated her pain, while rest, heat application, and medications provided some relief. She rated her pain with activity as 8 out of 10 on the Numeric Pain Rating Scale (NPRS), and her Oswestry Disability Index (ODI) indicated 68% disability.

Physical Examination Results

Active range of motion was measured using a single goniometer calculated to percentage loss. The cervical spine was within normal limits. The thoracic spine revealed loss of grossly 50% of ROM on right lateral flexion with pain through the motion and left lateral flexion was within functional limits. Lumbar/Lumbosacral region revealed loss of 25% of ROM on extension of spine with end range pain, flexion was within functional limits, loss of grossly 50% of ROM on left lateral flexion with pain throughout ROM and right lateral flexion was within functional limits.

Motor testing was performed by manual muscle tests for myotomes and sensory testing was performed for superficial, deep sensations over dermatomes that were within normal limits. Special tests were performed to aid in making a diagnosis. Adam's forward bending test was used to identify scoliosis (sensitivity is 92% and specificity is 60%) [14], and was positive for prominent right thoracic hump. On Cibulka's criteria [15], 4 of 4 tests were positive: Standing flexion test: Positive for right anteriorly rotated innominate (AI) and left posteriorly rotated innominate (PI) compared to pubic symphysis. Seated palpation of posterior superior iliac spine: positive for innominate rotation. Supine-long sit test: positive for right posterior rotated innominate and left anterior rotated innominate with apparent lengthening of left lower extremity (LE) and shortening of right LE on long sitting. Prone knee flexion test: shorter left leg. Straight leg was positive on right side at 90 deg. The patient identified goals including lifting and carrying a child, bending and lifting, prolonged carrying, prolonged sitting without pain, squatting, and walking long distances. These tasks represented the highest level of difficulty and were essential both for fulfilling familial responsibilities and meeting the demands of her job. Skilled physical therapy was necessary to address these goals effectively.

Results of Special Tests and Other Investigations

Imaging studies revealed segmental dysfunction in the upper cervical and upper thoracic spine. The thoracic spine exhibited a right lateral curve from T4 to T12 with a Cobb's angle of approximately 18 degrees and a hypo-kyphotic thoracic curve. The lumbar spine demonstrated a mild left lumbar convexity with the apex at the L2-L3 level, with a Cobb's angle measuring approximately 10 degrees from L1 to L4. Additional findings included foraminal narrowing at L5-S1, a deficient left ilium measuring approximately 3 mm smaller than the right. These findings aligned with the patient's reported symptoms and functional limitations, which significantly impacted her ability to perform daily activities.

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Treatment Plan

The treatment plan included a combination of SIJ and thoracolumbar manipulation and mobilization techniques, along with scapular mobilization, and therapeutic exercises targeting stabilization and mobility. Scoliosis-specific exercises using the SEAS approach [16,17] and MDT techniques [18] were included for a comprehensive approach. Additionally, orthotic modifications were applied, and a Home Exercise Program was provided to reinforce spinal alignment, self-correction, and spinal stabilization.

Interventions

Phase 1: 1st month for 8 sessions 2 times a week for 4 weeks

Phase 2: 2nd month 4 sessions 1 time per week; 3rd month 3 sessions 1time per week. Patient skipped the last week

Phase 3: One phone calls each month 4th, 5th and 6th for HEP enquiry and outcome scores on the 6th respectively.

Phase 1:

Mobilizations Grade 2-3

1. Individual thoracic spine mobilization
2. Superior, inferior and rotational scapular glides
3. Posterior and anterior rib mobilization.

Manipulation: minimally utilized

1. Anterior thoracic thrust: opening manipulation for thoracic spine (3rd and 4th session)
2. Supine lumbopelvic roll to correct left PI (3 consecutive sessions in 1st and 2nd week)
3. Side lying lumbar roll for lumbar to release lumbar area (2nd, 3rd and 4th week)

Exercises were prescribed per tolerance and alternatively for 4 weeks during the course.

1. Stabilization: dead bug, pelvic tilts with a bridge and progressed.
2. Mobility: hand heel rock
3. SEAS: Self correction in sitting (spinal elongation), bird-dog exercise, side stretch on child's pose and utilized a mirror for feedback.

Phase 2:

2nd month:

1. Spinal mobilizations Grade 3-4 alternative sessions
2. Scapular mobilization alternatively
3. SIJ manipulations: Right Post SIJ rotation to correct anteriorly rotated innominate on the right side and Anteriorly SIJ rotation to correct posteriorly rotated innominate on the left side.
4. Orthotic modification: Right heel lift on right side and left sole lift and heel drop.

3rd month focused on exercises as the pain was limited to mid thoracic spine and NPRS was 2/10 and hence manipulations were held back. Exercises introduced during 2nd and 3rd month were MDT protocols introduced along with SEAS progressions.

MDT exercises:

1. Side glide in standing OR Doorway hula.
2. Thoracic extension/rotation.
3. Extension in lying with hips off center specific to scoliotic curvature.

SEAS:

1. Step and reach engaging the core.
2. Side lying thoracic self-mobilization.
3. Prone scapular strengthening and progression.

Home Exercise Program (HEP)

The Home Exercise Program incorporated a combination of McKenzie Method (MDT) and Scientific Exercise Approach to Scoliosis (SEAS) principles, along with targeted mobility and strengthening exercises. The exercises and their progressions are outlined below:

Basic upper and lower body stretching exercises were included in HEP.

1. Hand-Heel Rock:

Performed to improve spinal mobility and flexibility.

No additional resistance; focus on controlled movement.

Performed for 10-15 repetitions per set.

2. Side Stretch in Child's Pose:
Focused on lengthening the lateral trunk and improving flexibility.
Hold each stretch for 15–30 seconds per side; progress to 3 sets per session.

3. Single-Leg Bridges:
Targeted gluteal and core strength.
Progressed with 3–5 lb weights placed on the pelvis.
Performed for 10–12 repetitions per leg; increase to 3 sets.

4. Planks and Side Planks with Self-Correction:
Emphasized core stability and proper alignment.
Plank holds started at 20–30 seconds, progressing to 1–2 minutes.

5. Side planks: Initially held for 15–20 seconds per side, progressing to 45 seconds–1 minute.

6. Bird Dog with Opposite Arm and Leg Extension:
Focused on spinal stability and coordination while maintaining a posterior pelvic tilt.
Performed for 8–10 repetitions per side; increase to 3 sets.
Hold each extension for 5–10 seconds, progressing to 15 seconds.

7. Upper Body TheraBand Exercises:
Included to improve scapular stability and upper body strength.
Resistance bands progressed from red to blue to black.
Performed for 12–15 repetitions per set; increase to 3 sets.

Progression Summary:
Resistance: Progressed using resistance bands (red → blue → black) for appropriate exercises.
Weights: Gradually introduced 3–5 lb weights for added challenge in bridging and upper body exercises.
Hold Time: Increased hold durations and repetitions systematically to build endurance and strength

Outcomes

Patients received a total of eighteen sessions of treatment over a period of six months. She was seen for eight sessions in the first month, seven sessions in the second and third month and a phone call with HEP each fourth, fifth and sixth month. On initial evaluation NPRS was 8/10, ODI was 68%- crippled, pelvic torsion tests were positive for right anteriorly rotated innominate (AI) and left posteriorly rotated innominate (PI). The thoracic spine revealed loss of 50% of ROM on right lateral flexion Lumbar/Lumbosacral region revealed loss of 25% of ROM, loss of 50% of ROM on left lateral flexion.

At the end of the first month, the ODQ score was 48%, indicating severe disability, and the NPRS was 5/10 with activity. Gradual improvements were observed in functional activities, including the ability to care for her child by bending to pick up and carry the child for 8–10 minutes, was able to sleep 5-6 hours on average, prolonged sitting for approximately 20 minutes, and standing for no more than 10 minutes.

By the end of the second month, the ODQ score improved to 36%, and NPRS decreased to 4/10 with the aforementioned activities. Improvements were noted in prolonged sitting and standing tolerance, increased sleep pattern, facilitating increased participation in functional activities such as household tasks.

At the end of the third month, the ODQ score significantly decreased to 30%, and NPRS further reduced to 2/10 during activities, with the patient performing these tasks with greater ease and sleeping up to 6 hours. A Home Exercise Program was recommended, and follow-up phone calls were scheduled at the end of the fourth and fifth months to address any questions or concerns.

At the six-month mark, the patient demonstrated significant improvement, with the ODQ score decreasing to 18%, indicating minimal disability, and NPRS further improving to 1/10 during all functional activities and sleep pattern normalizing up to 7 hours.

Discussion

Significant improvements in symptoms were observed in this study with mere diagnoses and treatment of SIJ dysfunction in conjunction with scoliosis. Therefore, a thorough assessment of lumbo-pelvic complex is needed to complete an evaluation of spine. Diagnoses and treatment of SIJ dysfunction and scoliosis clearly dominated the final outcomes in this study. Sacroiliac joint dysfunction is often misdiagnosed as a herniated disc or degenerative joint disease because it can present with similar symptoms, including radiating pain into the lower back, groin, buttocks. This overlap in symptomatology can make it challenging to distinguish between these conditions without a thorough clinical evaluation of pelvic complex [19]. The evaluation of back pain due to scoliosis and specifically low back pain can be significantly narrowed by conducting a thorough physical examination combined with the application of specific provocative maneuvers, which are instrumental in diagnosing sacroiliac joint pain [19]. We see these conditions almost every day in outpatient facilities. Therefore, this study targeted a patient with SIJ dysfunction and scoliosis. Treatment incorporated approaches like MDT, SEAS, specific manipulative techniques, and general treatment improved quality of life considerably for patients with scoliosis who were able to perform an activity of daily living with less pain. The sustainability of outcomes beyond the treatment period is a critical aspect of rehabilitation, particularly in cases of complex musculoskeletal dysfunctions like combination of sacroiliac joint dysfunction and double scoliosis. Long-term success depends on addressing the root causes of dysfunction, incorporating patient education, and establishing a comprehensive home exercise program. The integration of self-correction techniques and habituation of these strategies along with lifestyle modification ensures the patient maintains proper biomechanics and prevents symptom recurrence. Additionally, periodic follow-ups to assess compliance and modify the HEP as needed can enhance the durability of outcomes. Patient education on ergonomic adaptations and lifestyle modifications further supports sustained improvements in pain, functionality, and quality of life beyond the clinical treatment period.

Conclusion

This case report highlights the importance of diagnosing and treating SIJ dysfunction alongside double scoliosis to achieve better patient outcomes. A comprehensive assessment of the spine and lumbo-pelvic complex is essential to identify the cause rather than relying solely on the assumed primary diagnosis and treating symptoms. Using cluster of SIJ tests, like Cibulka's criteria for SIJ dysfunction and combination with specific treatment techniques such as MDT and SEAS approach, was effective in reducing pain and improving the patient's functional mobility.

Furthermore, a structured home exercise program supported the treatment, helping the patient progress and prevent injuries. Patient education on self-correction and feedback, maintaining proper posture, and making lifestyle adjustments was key to sustaining the improvements long-term.

This case emphasizes how SIJ dysfunction and scoliosis can be closely related and why it's important to include SIJ assessments in evaluations. It also shows the value of a comprehensive, patient-focused approach that looks at multiple factors' contribution of symptoms.

However, since this report is based on a single patient, the results may not apply to everyone. More research is needed to develop better tools for diagnosing SIJ dysfunction in outpatient physical therapy and to explore new treatment methods. By expanding knowledge in this area, physical therapists can improve their ability to diagnose and treat complex cases, leading to better outcomes and quality of life for patients.

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