



Pelvic Floor Physiotherapy in the Treatment of a Patient with Interstitial Cystitis: A Case Report

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DOI: 10.31080/ASWH.2024.06.0609

Received: March 13, 2024

Published: July 29, 2024

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Abstract

Objective(s): Hypertonic pelvic floors are common in patients with interstitial cystitis (IC). This case study looks at a patient with IC's physiotherapy diagnosis, care, and results.

Study Design: A case study with a single subject that details the patient's IC patient's initial examination, interventions, and results of pelvic floor physiotherapy. To inform interventions in cases that are similar to this one, the case report provides a thorough account of every session and the patient's response.

Case Description: The management of a patient with an IC diagnosis who also experiences urgency and frequent urination is the focus of this case study. Pelvic floor physiotherapy, behavioral therapy, internal and external manual therapy, therapeutic exercises, and education were among the interventions used.

Results: The patient was able to resume full-time employment and sexual activity with little to no pain after 20 physiotherapy sessions spread over three months. As measured by the Short-Form McGill Pain Questionnaire, pain was decreased by almost 80%. The patient had below average scores in seven of the eight SF-36 quality-of-life subcategories during evaluation, but by the time of discharge, scores had improved to above-average in seven of the subcategories.

Discussion: Hypertonic pelvic floor disorders are frequently associated with the diagnosis of IC. For complex IC patients, a combination of pelvic floor physiotherapy techniques may be required to alleviate nocturia, bladder pain, and frequency and urgency of urination.

Keywords: Low Back Pain; Dyspareunia and Interstitial Cystitis

Background

Physiotherapy management and results are complicated for many women with interstitial cystitis (IC) because of coexisting pelvic floor dysfunction and symptoms, such as pelvic floor muscle (PFM) spasm, low back pain (LBP), and dyspareunia. IC is still primarily diagnosed by exclusion and is characterized by dysuria, persistent bladder pain, and frequency and urgency of urination. Prior to an individual being diagnosed with IC, it is common practice to rule out bladder cancer and urinary tract infections [1,2]. According to one review, "Any patient who complains of pelvic/perineal pain, urgency, or frequency in the absence of any identifiable cause, such as carcinoma or bacterial infection, is considered to have IC" [3] (p328). Recent research has shown that the prevalence of IC is far higher than previously believed. It was discovered through a survey of almost 150 000 households that between 3 point 3 million and 7 point 9 million Americans suffer from IC. One

common association between an IC diagnosis and a diagnosis of sexual pain or dysfunction is that 90 percent of women diagnosed with IC also had at least one instance of sexual dysfunction during the preceding four weeks [3]. It is well known that PFM spasm is present in patients diagnosed with dyspareunia, low back pain, and sacroiliac joint (SIJ) dysfunction in addition to other pain diagnoses such as IC (irritable voiding) [4-15]. The PFMs in case of IC are often overactive.

Case Description (History, Systems Review, Tests, and Measures)

Patient history

The patient, a 38-year-old woman (G0P0), was referred to physical therapy from an urogynecologist. The patient history was taken in an oral interview format, guided by the Pelvic Pain Assessment form created by the International Pelvic Pain Society [4]. The patient

reported severe urgency and frequency of urination with burning urethral pain, as well as a “dull ache” in her lower back and suprapubic region coinciding with a full bladder that significantly affected daily life. In addition, she complained of deep pain with sexual intercourse lasting up to days after, and urinary urgency during intercourse. Nocturia was reported, with the patient waking 5 to 6 times each night. The patient reported the onset of her symptoms approximately 6 months prior to the initial physical therapy evaluation, with progressive worsening of pain and symptoms forcing her to seek medical care. When further questioned about the species of symptom onset, the patient reported similar symptoms with decreased intensity and frequency (both urologic and back and pelvic pain) since giving birth more than 15 years ago [5]. During the examination, the patient also complained of severe back pain that had increased since the onset of her voiding symptoms, disturbing her sleep and causing severe pain with sitting and any form of supine or side-lying positions. Aggravating factors to her pain included sexual intercourse, vaginal and labial contact with clothing, full bladder, stress, urination, sitting, and standing. Easing factors to her pain included bowel movement, stool softeners, heating pad, and hot bath. The patient had a history of constipation, which has been shown to exacerbate bladder and back pain [7,8]. The patient had participated in yoga or other exercise 5 or 6 times per week, although her activities had been curtailed because of the increase in her symptoms, particularly her LBP. With a pending IC diagnosis, she reported following an IC diet [9] eliminating caffeine, alcohol, and other trigger foods. She also reported limiting water intake due to urinary urgency and frequency.

In addition, functional deficits and negative effects on social life and coping mechanisms were addressed in the patient interview, as these are a common by-product of this triad of diagnoses [4,5]. Prior to symptom presentation, the patient was a full-time social worker. Upon initial evaluation, she was unable to work and had taken a medical leave of absence due to the severity of her symptoms. She reported that her relationship with her husband was strained not only because of her inability to have sexual intercourse but also with her recent role change in the household (going from full-time employment to not working). She was having significant difficulty caring for her family, sleeping, and performing other aspects of daily life due to severe pain as well as severe urinary urgency and frequency. She self-reported depression over onset of symptoms, and she also reported a supportive group of family and friends in addition to seeking help from a psychologist when needed during these challenging times.

Medications

The patient had seen 4 physicians, all of whom had recommended or prescribed different medications for pain and symptom relief. The patient was being treated with bladder instillations of heparin and bupiracaine 1 or 2 times per week by the referring urogynecologist, with only slight relief experienced. She was prescribed acetaminophen/hydrocodone by her primary care physician for the LBP, but the patient reported using the medication sparingly due to the side effects of nausea and constipation. Zolpidem had

also been prescribed by another physician for pain-related insomnia. Her gastroenterologist had prescribed polyethylene glycol for constipation, which had not eliminated this symptom. The patient had also started baclofen vaginal suppositories 1 day prior to evaluation, prescribed by her referring urogynecologist. The patient chose to not try Elmiron at this time [28].

Medical/Surgical History/Systems Review

Pertinent medical history included a history of bulimia and laxative abuse, for which she had sought treatment. She indicated control over her eating disorder for more than 20 years at the time of initial evaluation. She reported a 10-year history of intermittent lower back pain and dysmenorrhea. The patient had undergone a breast-reduction surgery approximately a year ago and a loop electrosurgical excision procedure more than 10 years prior to the initial evaluation. No red flags were present in the patient’s systems review, and vital signs were within normal limits.

Tests and measures

Outcome Measures The SF-36 was administered to measure quality of life. The SF-36 includes 8 subcategories or subscales, where a category score below 50 is considered below average. The Short-Form McGill Pain Questionnaire was also administered to the patient [10]. Responses on the Short-Form McGill Pain Questionnaire outcomes are rated on a 4-point scale (none = 0; mild = 1; moderate = 2; severe = 3) for 15 different descriptors. The rest 11 describe sensations with a possible maximum severe pain rating being 45. The patient’s pain was also assessed on the Verbal 4 describe patient Rating Scale Pain Scale (1-10 scale).

External assessment

The patient gave informed consent before initiating examination, including consent to examine external and internal pelvic structures [2]. Her posture was not one typically associated with pelvic pain (characterized by excessive anterior pelvic tilt, lumbar lordosis, and thoracic kyphosis) but did represent consistency with LBP classification of being extension sensitive [43]. Regardless, a sending of faulty posture is consistent with the literature. Women with chronic pelvic pain have faulty posture, movement patterns, and body awareness compared with women without pelvic pain [43]. Her posture faults included forward head and rounded shoulder posture, with a posterior pelvic tilt in the standing and sitting positions. She showed overactive bilateral gluteal recruitment in standing. In standing, her left iliac crest and gluteal fold were elevated compared with the right. Supine bony landmark palpation revealed left ilial posterior rotation with out are, elevated left pubic symphysis height, and tenderness with palpation along left suprapubic ramus. SIJ and postural assessment was performed per Richard Jackson’s and Diane Lee’s examination techniques to assess the potential effects of faulty biomechanics of the pelvis affecting the pelvic floor [21]. The patient was found to have functional SIJ dysfunction. She demonstrated left SIJ hypomobility along with the positional fault of the ilium on sacrum. Gross assessment of trunk range of motion in exion/extension, side-bending, and lateral rotation was all found to be within normal limits [22,48]. The patient

experienced pain at end range of lumbar extension and was exhibiting pain avoidance postures to bias toward lumbar flexion. Bilateral hamstring length, measured by the 90-90 hamstring test, revealed bilateral limitations (-45° R; -30° L) [22]. All other lower extremity range of motion was within normal limits except hip external rotation, which was measured at 40° , whereas hip internal rotation was measured at 35° bilaterally. In the active straight leg raise (ASLR) test, the patient showed increased ability to perform ASLR on the left with anterior compression of pubic symphysis, indicating transversus abdominis weakness. The patient demonstrated hypomobility of L2 and L3 via posterior-to-anterior spring testing, hypermobility of L4, capsular end feel of L2-L3, and painful end feel of L4. 48 Marcher's test showed a positive left SIJ ilial on sacral motion with a positive Trendelenburg sign in single limb stance [4]. In the straight leg raise test for sciatic nerve tension testing, the patient presented with negative results for crossover sign, indicating no lumbar disc pathology [50]. Passive straight leg raise test was positive at 35° for sciatic nerve irritation, with primary mechanical interface of the nerve at the proximal hamstring and piriformis. Lower extremity strength, upper extremity strength, and upper extremity range of motion were within normal limits. Test of diastasis recti abdominis was negative. The patient's deep tendon reflexes were also found to be within normal limits, lower extremity sensation was intact to light touch and sharp/dull, and perineal sensation was intact to light touch.

Pelvic floor internal examination

A thorough pelvic floor internal examination consists of an assessment of PFM strength, presence of trigger points, and symptom reproduction to palpation of the pelvic floor musculature. The quantification of a pelvic floor contraction is problematic especially in patients with PFM spasm. There is no validated scale to quantify contractions of the PFMs in patients with a hypertonic pelvic floor; therefore, quantification—more than absent, weak, normal, or strong—is not recommended [13]. During assessment of PFM hypertonicity and symptom reproduction, a severe or strong rating was given when pain associated with palpation met or exceeded 7/10 on the self-reported pain scale. Stiffness in the musculature and the presence of any twitch, spasm, or trigger point were also noted. Often resting tone is measured with a transvaginal electromyography assessment. But the patient had significant pain, thus electromyography was not used to prevent exacerbation of symptoms. PFM strength was strong, with a muscle endurance hold of 5 seconds. However, she had difficulty relaxing PFMs after contraction, indicating poor PFM coordination. Severe PFM trigger points and pain were located in the left of super special transverse perineal, PC (puboococcygeus), IC (iliococcygeus), OI (obturator internus), piriformis and coccygeus, and urogenital diaphragm (UGD)

muscles. Urinary urgency was reproduced with palpation of bilateral IC-OI interface at ischial spine and bilateral UGD muscles. Pelvic floor hypertonicity was found to be moderate (pain associated with palpation met 4-6/10 of the pain scale) on the right super special transverse perineal, PC, IC, OI, piriformis and coccygeus, and UGD muscles. Palpation of bilateral deep IC, OI, and coccygeus reproduced (left greater than right) pain similar to that during intercourse. She reported increased tenderness of pelvic clock at introitus from 2 to 6 o'clock but demonstrated a negative Q-Tip test. Myofascial assessment for trigger points of the pelvic girdle muscles revealed pain and trigger point presence with palpation of the bilateral quadratus lumborum, lumbosacral multidose, bilateral piriformis, bilateral gluteus maximus and medius, and bilateral iliopsoas, bilateral short and long adductors, and proximal hamstrings. The assessment revealed significant restriction of ischioanal, suprapubic, and abdominal fascia, with increased tissue tension of sacrospinous and sacrotuberous ligaments [8].

Evaluation and physical therapy diagnosis

The patient presented with moderate to severe pelvic floor tension myalgia/muscle spasm that contributed to urinary urgency and frequency, pain with intercourse, and suprapubic pelvic pain. Symptoms and PFM spasm were complicated by left SIJ dysfunction, a history of LBP, and current LBP are, in addition to core musculature and hip muscle weakness. During examination, most of the patient's IC/irritable voiding symptoms were reproduced with PFM palpation, indicating PFM spasm as the dominant pain mechanism in this case.

Prognosis Because of the patient's relatively recent worsening of symptoms, prognosis was deemed good to excellent for full resolution of all pelvic pain symptoms and LBP. Because of the chronic nature of IC, the patient will likely always be susceptible to irritable voiding symptoms but would likely see a significant decrease in urinary urgency and frequency symptoms since these symptoms were reproduced with PFM palpation and presence of PFMS.

Physical therapy intervention

Manual therapy was the primary physiotherapy modality used and consisted of manual trigger point release, myofascial release, and Thiele massage to transvaginal PFMs. Other techniques used for surrounding areas at the pelvic girdle were myofascial release (including skin rolling), connective tissue mobilization, joint mobilization (SIJ, hip, lumbar, and thoracic spine as indicated), neural glides (for both sciatic and pudendal nerves), muscle energy techniques, contract/relax techniques, and visceral mobilization. * These interventions were chosen to release PFM spasm and trigger points, as noted in the initial examination, as well as addressing dysfunc-

tion from the pelvic girdle to attend to LBP [2,6-8,14,16,17,20,21]. Therapeutic exercises were selected on the basis of the patient's needs in lengthening and strengthening found on the evaluation. Therapeutic exercises began with pelvic floor relaxation stretches and diaphragmatic breathing instruction. The first stretch taught to the patient was the "Happy Baby" yoga pose, which both relaxes the pelvic floor and biases toward lumbar flexion. The patient was progressed to a deep squat stretch when symptoms and hip muscle length allowed. As the patient's pelvic floor musculature began to respond to manual therapy and was less prone to painful Ares, she was progressed to core stabilization exercises, including transverse abdominis and lumbosacral multifidus recruitment, as well as incorporating other pelvic girdle structures and hip stabilizers into exercises. The patient was monitored throughout sessions and was progressed accordingly based on strength and edibility improvements and response to exercise throughout the program. The patient's exercise position was modified for a flexion bias, as she was found to be positionally sensitive to lumbar extension on initial evaluation [49]. The importance of rehabilitating multifidus and transversus abdominis muscles in patients with LBP is well documented [7,8]. Diaphragmatic breathing was implemented as an exercise unto itself in addition to being incorporated into core stabilization. Chaitow points out this importance in an article by Key et al that cautions the therapist to be aware of "core rigidity" when core stabilization exercises are taught to the patient without functional movement patterns and proper breathing. This patient was monitored frequently for proper breathing patterns during therapeutic exercise in addition to using diaphragmatic breathing as a pelvic floor relaxation exercise. There is a clear connection between respiratory function, pelvic floor function and tone, and SIJ stability, particularly in women [1]. Examination of this patient demonstrated objective evidence that all 3 of these components needed to be addressed in her exercise program. The patient was educated with visual aids in the anatomy and physiology of the pelvic girdle and PFMs, and how symptom presentation may have neuromuscular and musculoskeletal contributions. She was also informed about proper water intake, keeping a voiding diary, urge suppression training techniques, proper body mechanics, and home exercise program. Home exercises included colon massage to relieve constipation, 38 crystal wand instruction for self-treatment of transvaginal PFM trigger point release, pelvic girdle-associated muscle stretching, and core stabilization program modified for patient's yoga classes. OUTCOMES the patient reported and maintained consistent decreases in LBP, urinary urgency and frequency, and PFMS, while demonstrated an increase in function and return to normal activities. The patient had 1c are due to admittedly abandoning home program and IC diet over family-based weekend. The patient was able to identify reasons for are and demonstrate self-correction techniques to decrease symptoms (Table 1). Upon discharge, patient reported substantial improvement in all symptoms. Urinary urgency and frequency were reduced to normal levels, and urethral pain with urination was also greatly reduced. Low back and SIJ pain was completely eliminated, and suprapubic pain

was substantially reduced upon discharge. Vaginal pain with intercourse and post intercourse was reported to be eliminated or only mildly bothersome according to the patient (Table 2). With the improvement in her condition, the patient was able to sit and stand for more than 2 hours, which has allowed her to resume many activities of daily living, including outings with her family and returning to her work as a social worker. She resumed sexual intercourse with her husband, with no discomfort or occasionally mild, intermittent pain. Nocturia was reduced to twice per night, improving the patient's sleep. She was able to return to her regular exercise routine of yoga 5 times a week. The patient reported only mild and intermittent symptoms and was pleased with her progress. She was confident her improvement would continue with consistency of home exercise program and self-treatment techniques (Figures 1 and 2). This patient demonstrated significant improvement on the SF36 quality-of-life measurement. As per the User's Manual for the SF-36(v2) Health Survey, norm-based scoring should be used to simplify interpretation. The general population norms are built into the scoring algorithm, which makes comparing this patient with normative scores valuable. In this case, the patient scored below average on 7 of 8 categories upon initial evaluation and above average on 7 of 8 categories upon discharge from physical therapy (see Figure 1). She also demonstrated a decrease on Short-Form McGill Pain Questionnaire, indicating a substantial improvement in pain symptoms. Her overall pain score was reduced from 29 of 45 to 6 of 45 at discharge. Substantial improvements were seen in both sensory (4-fold reduction) and affective (8-fold reduction) categories.

Discussion

At the time of her initial physical therapy evaluation, it was clear that the patient's primary symptoms, pain, and functional limitations were related to her acute LBP. Concurrently, her PFMs were extremely hypersensitive, likely due to not being able to lie supine without pain. For those reasons, the initial focus was on relieving the acute pain to allow for proper positioning and reducing the internal hypersensitivity of tissues. Manual therapy for the rest 4 visits consisted of correction of pelvic obliquity, SIJ mobilization, neural mobilization of the sciatic nerve, and lumbar spine joint mobilizations at grades I and II for inflammation reduction. Manual therapy during these visits was externally focused and consisted of tissue approximation techniques, rather than internal trigger point release, which was too painful for the patient to tolerate at that time.

After 5 visits, the patient reported substantial reductions in LBP. After the patient's LBP had been reduced, urinary frequency and urgency became the patient's primary symptoms, and the pelvic floor hypersensitivity abated to the point where internal therapy was tolerable for the patient. Trigger points within the pelvic floor, primarily the urogenital diaphragm muscles, directly reproduced the patient's specific urinary urgency. Sexual pain was reproduced with palpation of levator ani muscles. Visits 5 to 15 focused on

Table 1. Summary of Treatments and Visit Outcomes

Visit	Manual Therapy	Education	Therapy Ex	Patient Reported Progress and Visit Notes
1	X	X	X	(Evaluation)
2	X	X		Patient used muscle-relaxant suppository prescribed by the physician; reported 50% reduction in pain by the end of the session and able to achieve comfortable position in supine.
3	X	X	X	Patient reported a continued 50% reduction in back pain; diagnosed with bladder infection; therefore, internal manual therapy held.
4	X	X	X	External treatment performed because of clearing bladder infection; patient reported continued decrease in back pain with improved sleep and urgency at night.
5	X	X	X	Patient continue >50% LBP improvement, and no longer reported LBP as her primary symptom; within-session improvement in urgency reproduction with internal PFM palpation from 8/10 (intensity) to 2-3/10.
6	X	X	X	Patient reported improved sleep due to decreased pain, LBP 85% gone; urinary urgency persists despite within-session improvements of urgency reproduction and decreased PFM spasm. Cystoscopy results: 75% bladder lining inflamed consistent with bladder irritation and IC.
7	X	X	X	Patient reported no LBP, and first decrease in urinary urgency.
8	X	X	X	During the session, trigger point reproduction of urinary urgency decreased from 5/10 to 1/10 with palpation of PFMs.
9	X	X		Patient reported overall improvement with urgency, now rating at 3-4/10 (vs 8/10 on initial evaluation). The patient was able to return to yoga exercise now that LBP was eliminated as a symptom.
10	X	X		Urgency decreased from 4/10 to 1-2/10 within session. The patient is continuing with yoga and core strengthening exercises. Worked to modify diet and home program to remove some restrictions to fit her current status.
11	X	X		Urgency decreased to 2/10; able to continue to increase yoga exercises.
12	X	X		Functional improvements continued, and the patient started to look for a new job and increased yoga to 3x per week. Sustained improvements in urgency even while "cheating" on diet.
13	X	X		Urgency improved, even with normal food triggers; job interview completed; urgency reduced to 2/10 with normalization of frequency.
14	X	X	X	Maximum intensity of urinary urgency reported as 1-2/10; patient began part-time work.
15	X	X		Symptoms consistently mild; the patient was confident in her return to work. Urgency no longer reproduced with PFM palpation.
16	X	X	X	Flare reported with increased urgency/frequency of urination after being "bad with diet over whole weekend," no yoga or home exercises.
17	X	X	X	Reduced urination to 1x per 1.5-2 h, 3-4x at night after the recent increase due to flare.
18	X	X	X	Mild to WNL PFM spasm; progressed to full-time work now; only mild intermittent symptoms.
19	X	X	X	Full-time work; discharged, 0-3/10 symptoms; intermittent mild urgency controlled by home exercise and self-treatment.

Abbreviations: LBP, low back pain; pelvic floor muscle; WNL, within normal limit.

Table 2. Improvements in Pain and Function

	Pretreatment	At Discharge
Urgency and frequency of urination	>16 times per day	<8 times per day
Low back and suprapubic pain	9/10	2/10
Burning urethral pain with urination	2/10	1/10
Burning vaginal pain introitus sexual intercourse	8/10	0-3/10
Deep vaginal pain with intercourse	9/10	0-3/10
Pelvic pain last 3 d after intercourse	7/10	0-2/10
Low back/SIJ pain	10/10	0/10
Pain in groin and suprapubic region when lifting	6/10	2/10

Abbreviation: SIJ, sacroiliac joint.

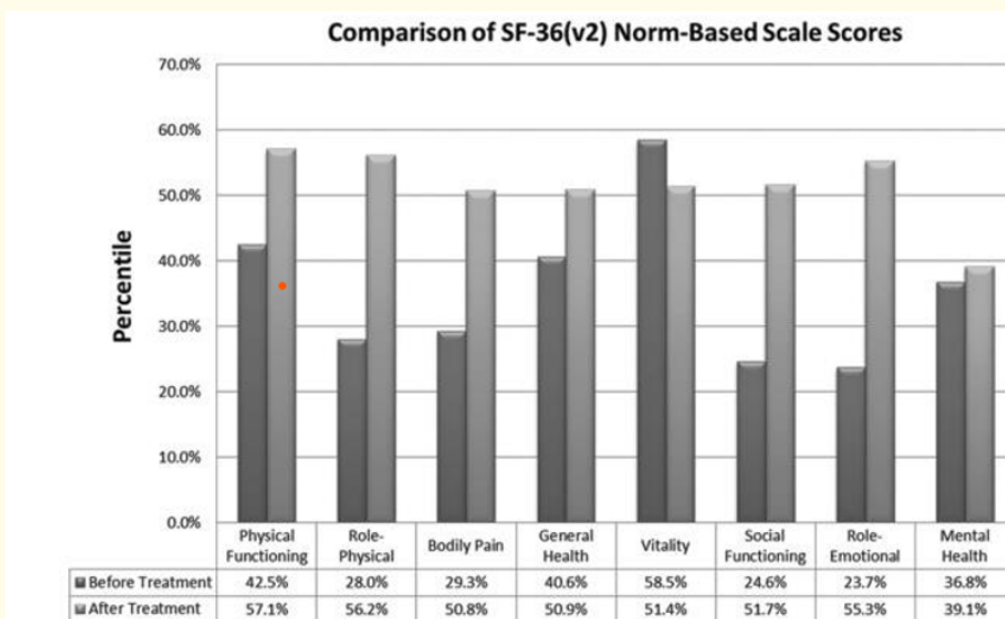


Figure 1: Improvement in SF-36 quality-of-life questionnaire.

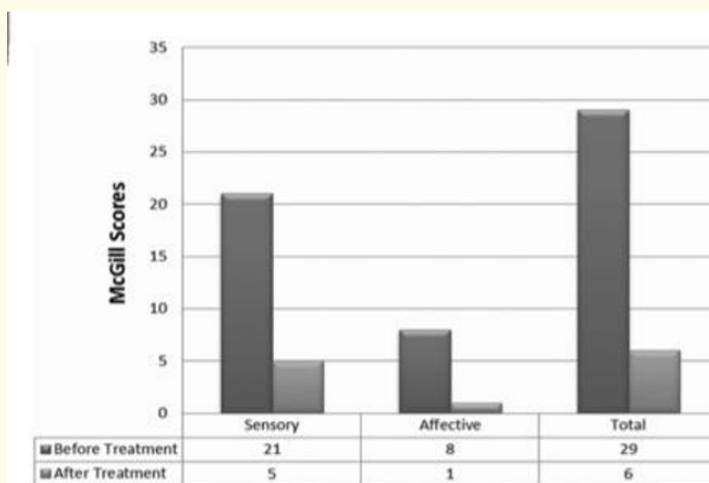


Figure 2: Reduction in pain on Short-Form McGill Pain Questionnaire.

manual therapy to decrease pelvic floor trigger points, which resulted in a decrease in urinary symptoms and sexual pain. This intervention was maintained because the patient continued to report improvements, both within and between sessions, even as the patient resumed work, exercise, and sexual intercourse. As expected, as she increased her activities of daily living, there was a corresponding increase in PFM trigger point presence, which was then addressed in treatment to allow her to continue to progress her activity level in a systematic fashion. In the next stage of management, from visits 16 to 19, sessions focused on eradicating any residual and even mild SIJ dysfunction or LBP, as well as any per-

sisting PFM trigger points, while the patient continued to progress toward full prior level of function, including full-time employment without symptoms. Visit frequency was reduced during this time. Additional focus was placed on core stabilization and educating the patient on independent management of ares and symptoms. The patient was educated on the practical implications of her long-term condition, including changes in diet and exercise. She was taught how to assess and respond to ares and increases in sexual pain, including modifying sexual positioning to minimize symptoms. Additional education included maintenance and self-interpretation of a voiding diary, trigger point release using the crystal wand, and pelvic floor relaxation.

Upon discharge following visit 19, the patient had returned to full-time employment at time of discharge, with no exacerbation of symptoms. She returned to her regular exercise program of high intensity Bikram yoga 5 times per week. She was able to engage in regular, non- or mildly painful sexual intercourse with her husband. Her back pain and SIJ pain were completely eliminated, with occasional Mild pain.

Overall, she reported a significant increase in confidence in being able to independently manage any residual symptoms. Additional research is needed in this patient population. The prevalence of this symptom presentation—LBP, sexual pain, and urinary urgency and frequency, and bladder pain—has not been well established. It is unclear whether there are any casual or risk factors in the relationship between orthopedic dysfunction in the pelvic girdle and pelvic floor dysfunction. Interventions for this complex symptom presentation are still subjective, and a standardized treatment protocol has not yet been developed. Further large-scale studies on pelvic floor physical therapy intervention are needed.

Conclusions

This case illustrates the benefits of a combination of orthopedic and pelvic floor physical therapy interventions to substantially improve outcomes for complex IC patients. Orthopedic and pelvic floor dysfunctions often coexist. Both must be addressed to alleviate the acute symptoms and allow for sustained improvement and return to full prior level of function. Appropriate and individualized physiotherapy can result in rapid and sustainable improvement in pelvic and LBP, as well as urgency and frequency of urination, and lead to the patient's resumption of the activities of daily living and ultimately improve her quality of life.

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