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Pelvic Physical Therapy for Chronic Pain and Dysfunction Following Laparoscopic Excision of Endometriosis: Case Report

ABSTRACT

Background: Pelvic pain and abnormal pelvic floor muscle (PFM) tension frequently are present in individuals with endometriosis and often persist even after surgical excision of the endometriosis lesions. Physical therapists are educated in improving muscle tone and function for individuals who have sustained injury, have had surgery, or have required rehabilitation for various pelvic health conditions. More scientific evidence is needed to support the benefits of physical therapy (PT) interventions for individuals with a history of endometriosis. **Case Description:** The 50-year old female patient presented in this case report underwent laparoscopic excision of endometriosis, yet she continued to experience discomfort in her left lower abdomen and vaginal area after surgery. Within a four month period, the patient participated in ten sessions of pelvic physical therapy that included manual therapy, instruction in relaxation techniques, and a home program. **Outcomes:** At the time of her discharge from physical therapy, the patient reported a reduction in symptoms on the Pelvic Floor Impact Questionnaire - Short Form 7 (PFIQ-7) and was able to resume activities that she had not previously tolerated because of abdominal and pelvic pain. **Discussion:** Identifying effective interventions for patients that have received surgical management is important. Pelvic physical therapy may help individuals avoid surgery and eliminate or reduce the use of medications. Because of the positive outcomes of this case report, it is recommended that when endometriosis is suspected or diagnosed, a pelvic physical therapy evaluation should be considered. Further research is needed to assess physical therapy as part of the standard of care for women with suspected or diagnosed endometriosis.

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ABSTRACT

Background: Pelvic pain and abnormal pelvic floor muscle (PFM) tension frequently are present in individuals with endometriosis and often persist even after surgical excision of the endometriosis lesions. Physical therapists are educated in improving muscle tone and function for individuals who have sustained injury, have had surgery, or have required rehabilitation for various pelvic health conditions. More scientific evidence is needed to support the benefits of physical therapy (PT) interventions for individuals with a history of endometriosis. **Case Description:** The 50-year old female patient presented in this case report underwent laparoscopic excision of endometriosis, yet she continued to experience discomfort in her left lower abdomen and vaginal area after surgery. Within a four month period, the patient participated in ten sessions of pelvic physical therapy that included manual therapy, instruction in relaxation techniques, and a home program. **Outcomes:** At the time of her discharge from physical therapy, the patient reported a reduction in symptoms on the Pelvic Floor Impact Questionnaire - Short Form 7 (PFIQ-7) and was able to resume activities that she had not previously tolerated because of abdominal and pelvic pain. **Discussion:** Identifying effective interventions for patients that have received surgical management is important. Pelvic physical therapy may help individuals avoid surgery and eliminate or reduce the use of medications. Because of the positive outcomes of this case report, it is recommended that when endometriosis is suspected or diagnosed, a pelvic physical therapy evaluation should be considered. Further research is needed to assess physical therapy as part of the standard of care for women with suspected or diagnosed endometriosis.

Keywords: endometriosis, pelvic physical therapy, pelvic floor muscle dysfunction

BACKGROUND

Endometriosis was first identified in the 1920s and defined as “the growth, adhesion, and progression of endometrial glands and stroma outside of the uterine cavity, with cellular activity evident in lesions, nodules, cysts, or endometriomas.”¹ Despite the fact that it was identified almost a century ago, endometriosis remains poorly understood. Management of the condition varies greatly and is dependent upon the health care providers’ knowledge of endometriosis and available interventions.

The gold standard of diagnosing endometriosis is through laparoscopy and biopsy of lesions. The prevalence of the condition is unknown because many women who have endometriosis are asymptomatic, some women are symptomatic but do not seek treatment, or some women who report symptoms are not always referred to specialists for laparoscopic assessment/diagnosis.² Also, because the severity of symptoms does not correlate well with extensiveness of the condition, women with more severe disease may go undiagnosed.¹

Common symptoms of endometriosis include dyspareunia, dysmenorrhea, dyschezia, dysuria, gastrointestinal complaints, painful bowel movements, lower back pain, and infertility.³⁻⁷ Pain is by far the most common symptom of endometriosis, yet the intensity and frequency of painful episodes vary greatly among individuals.³ This variation of symptom presentation is another reason that true prevalence is not known. For example, many women only experience pain beginning 1 to 2 days prior to menstruation on one or both sides of the pelvic region that resolves at the end of their cycle.^{3,4} Yet, other women experience constant, debilitating pain that dramatically affects their quality of life.⁸

Women with this condition often experience additional pain produced by sources other than the endometriosis lesions. When the nervous system is sensitized because of the disease process, nociceptive thresholds are lowered, and pain is more easily perceived. Additionally, neuropathic up-regulation that results from the nervous system sensitization may lead to cross-referral of pain — from viscera to muscle and vice versa.⁹ Another common result of neuropathic up-regulation is that the pelvic floor and other core muscles become overactive, and dysfunction develops throughout the kinetic chain, often affecting posture, gait, and alignment of the pelvis and spine.^{10,11}

Because overactivity of PFM is commonly associated with endometriosis, and because of the significant role the PFM play in bowel, bladder, and sexual function, restoring normal tone to these and other associated muscles of the lumbopelvic region is essential.^{12,13} For those patients with endometriosis in which muscle overactivity and/or spasm is found, the physical therapist who is specifically trained in pelvic floor dysfunction (PFD) is able to provide clinical interventions and instruction in a home program that lead to improvement of symptoms.¹⁴

Medical interventions for management of endometriosis include hormone therapy, over-the-counter and prescription pain medications, and laparoscopic removal of the endometrial lesions.² For those women in which medication and/or hormone therapy eliminate or significantly improve symptoms of endometriosis, surgery can be avoided. For those women who do not have a significantly positive response to medications or hormone therapy, surgical removal of endometriosis is often helpful in eliminating pelvic pain and dysfunction. However, if PFD is present in individuals with endometriosis but is not addressed, it is very likely that pain and dysfunction will persist despite effective hormone therapy and/or successful surgical removal of endometriosis lesions. For this reason, it seems appropriate that all women with suspected or diagnosed endometriosis should undergo a thorough PFM evaluation.

Pelvic PT involves various interventions including manual techniques such as trigger point and myofascial release, strain counter-strain, muscle energy, soft and deep tissue mobilization, scar mobilization, and passive stretching. Patients also may receive instruction in core strengthening, relaxation techniques, stretching of hip and back muscles, biofeedback, and use of medical devices such as the TheraWand (Pelvic Therapies Inc., Carlsbad, CA) and vaginal dilators for home/self manual therapy of the PFM.^{12,13,15,16} The type of intervention is determined by the nature of the dysfunction that is present. For example, having patients perform PFM strengthening exercises when the PFM resting tone is normal is appropriate and will most likely be beneficial. However, having patients perform PFM strengthening exercises when a high resting tone is present may not be appropriate, and symptoms may increase. For this reason, not all pelvic PT methods are appropriate for every patient; the specific interventions for PFD must be carefully chosen based on the findings of the PFM examination.

The purpose of this case report is to promote pelvic PT as part of the standard of care for individuals with suspected or known history of endometriosis. The case presented in this paper describes the rationale for the interventions provided to an individual

with PFD following surgical excision of endometriosis, and the outcomes support pelvic PT as an effective tool for individuals with history of endometriosis.

CASE DESCRIPTION

Patient History

A 50-year old female was referred to PT for treatment of PFD. She had undergone multiple procedures including abdominoplasty and three surgeries related to endometriosis. The abdominoplasty was performed to remove a significant amount of loose skin that remained after her two pregnancies. In the years following this procedure, she developed left lower abdominal pain that progressively worsened. Because of its cyclic nature, the pain was thought to be caused by endometriosis, and the patient underwent a supracervical hysterectomy. When the pelvic pain was still present a few months later, she was given injections of Lupron, a synthetic hormone commonly used to treat symptoms of endometriosis. The first injection provided relief of the pelvic pain, but the patient began having hot flashes which are common side effects of Lupron. She was prescribed Micronor, a form of progesterone, to help with the hot flashes and endometriosis pain, but it was not effective and was discontinued.

A year and a half after the hysterectomy, because of continued pain and the development of a large fibroid and a cyst on her left ovary, the patient underwent a second procedure for removal of that ovary. She continued the Lupron injections, and her pain was improved temporarily. She was prescribed Clonidine, a hypertensive drug, to help with the hot flashes caused by the Lupron, and several months later progesterone cream was prescribed, also to help with the hot flashes. As the pelvic pain persisted, she was prescribed Tramadol, Oxycodone-Acetaminophen, and Xanax to use as needed.

Over the next couple of years, the patient continued to have severe, stabbing-like pain in her lower abdomen just before bowel movements, moderate pain with standing or walking for prolonged periods, and severe pain with any attempt to exercise. She was too fearful to attempt intercourse because of anxiety about her symptoms worsening. When the pain became debilitating, she consulted with a gynecologist who specialized in the treatment of endometriosis. A final surgery was performed that included right oophorectomy, bilateral salpingectomy, and excision of multiple endometriosis lesions and scar tissue from previous surgeries. After the surgery, the patient was prescribed Minivelle, a hormone patch to help with hot flashes, but it was discontinued because of elevation of her blood pressure. At this time, she discontinued all medication except Tirosint for hypothyroidism and Brintellix for depression.

Two months after this last surgery, the surgeon referred the patient to pelvic PT because of PFD that was believed to be contributing to some of her pain. She was experiencing left lower abdominal discomfort and a deep ache in the vaginal region occasionally at rest, but these symptoms were exacerbated by any attempts to increase her activity level. The patient had been cleared to resume all activities, including yard work, walking for exercise, and sexual intercourse, but she began experiencing flares of her symptoms when she increased simple household chores or activities away from home. At the time of the initial PT session, she had not yet attempted intercourse since surgery because of her anxiety about pain that she had experienced in the past.

This patient was previously very active with her family; she enjoyed cooking, traveling, and various outdoor activities such as yard work and hiking. Her goals were to resume these activities and to have intercourse without causing flare of her symptoms.

Timeline of Surgical and PT Interventions

Jan 1997	Abdominoplasty
May 2008	Supracervical hysterectomy
Sept 2009	Left oophorectomy
Dec 2015	Right oophorectomy, left salpingectomy, excision of endometriosis lesions and scar tissue
February-June 2016	Pelvic PT (10 visits)
June 2016	Discharge from PT

Clinical Impression #1

Aggravation of symptoms with increase in activity is often reported following excision of endometriosis when PFM overactivity or spasm is present. Because this patient felt little to no discomfort unless she became more active, the impression was that her core muscles, including those of the pelvic floor, were weakened because of their chronically protective/guarded state. Increase in activity was too much stress for these muscles, and the response was muscle spasm and pain.

Examination

The patient had been under the care of her surgeon within two weeks prior to initiating PT. Upon beginning pelvic physical therapy, the patient filled out two pelvic floor dysfunction-related questionnaires, the Pelvic Floor Distress Inventory - 20 (PFDI - 20) and the

Pelvic Floor Impact Questionnaire - 7 (PFIQ - 7), both of which have been shown to be valid and reliable in assessing distress and health-related quality of life in individuals with pelvic floor dysfunction (PFD).^{17,18} The patient scored 0 on the PFDI - 20, as she was not experiencing symptoms associated with pelvic organ prolapse or urinary dysfunction. On the PFIQ - 7, with possible scores from 0-100 (100 being the highest score or indicating most severe impact), she scored 0.0 for bladder, 9.7 for bowel/rectum, and 66.7 for vagina/pelvis.

Posture and quality of movements were evaluated by observing the patient in standing, sitting, and supine positions and by palpation of bony landmarks to identify possible asymmetries or alignment deviations. No abnormal findings were observed. The patient performed transfers from supine-to-sit and sit-to-stand without difficulty. Her gait was observed to be normal and without report of discomfort in hips, back, legs, or pelvic region for short distances.

Because the patient's pain was within the pelvic region, including the lower abdomen and vaginal areas, it was important to perform a musculoskeletal examination of the muscles and joints of the lumbo-pelvic-hip complex. The Faber Test was performed, as this test has high specificity and inter-rater reliability for assessment of the hip and sacroiliac joints (SIJ) and is a recommended tool to help with diagnosis of pelvic girdle pain.¹⁹ The test was negative; therefore, the hip and SIJ were not considered as contributors to the pelvic pain. The pubic symphysis was palpated for pain, but no discomfort was reported. Muscle length and flexibility were found to be normal for bilateral lower extremities and hips, and lower extremity strength was tested by manual muscle testing, revealing no weakness or asymmetry. The patient denied hip, back, pelvic, and leg pain with active hip movement and during muscle testing of the lower extremities. Palpation of the hip muscles revealed no trigger points, but there was mild soreness/overactivity/guarding found within the bilateral gluteals and left piriformis.

Because the location of some of the patient's pain was in the left lower abdomen, palpation of the abdominal muscles was performed by applying gentle pressure along the muscles of the entire abdomen to compare variation in tension. No trigger points were found, but there were some areas within the left abdominal and psoas muscles that felt like knots or bands, and the patient complained of soreness when pressure was applied to these specific areas of those muscles. Because the patient had a total of three abdominal surgeries, and because of the association between chronic pelvic pain and abdominal scarring and/or adhesions, it was important to assess the mobility of her abdominal scar tissue.²⁰ The patient exhibited moderate restrictions in connective tissue mobility, but no scar sensitivity was reported. The patient reported no lower back pain, and palpation of back extensors and quadratus lumborum revealed no abnormal tension or trigger points.

In some cases, the origin of pelvic pain may be PFM overactivity or spasm that has developed because of trauma, such as during vaginal delivery or pelvic surgery. In other cases, PFD develops in response to common painful conditions such as endometriosis, vulvodynia, or interstitial cystitis.²¹ Tu et al found that 37% of the patients with chronic pelvic pain presented with abnormal musculoskeletal findings compared to 5% of controls who did not.¹¹ The results of the study by Tu et al signify the importance of close examination of the musculoskeletal system in patients with pelvic pain for accurate diagnosis and effective treatment.¹¹

Because of the significant role the pelvic floor may play in pelvic pain, whether as the primary or secondary source, it is logical that a thorough PFM evaluation be a standard part of the overall assessment of patients with pelvic pain, regardless of the suspected cause. The patient was asked to sign a consent form explaining that she understood that she would undergo an internal (vaginal) and external PFM assessment as part of the initial examination.

The pelvic floor assessment included four parts: 1) a visual inspection of the perineum, 2) external muscle palpation, 3) internal muscle palpation, and 4) testing of PFM strength and tone.

First, the patient was positioned in supine with her hips in slight flexion/abduction/external rotation. A visual inspection of the vulva, perineum, and anus revealed healthy tissues without signs of infection or inflammation.

Second, the external assessment of the superficial perineal layer, including the bulbocavernosus, ischiocavernosus, and the superficial transverse perineal muscles was performed by applying light to moderate pressure along these muscles using one gloved finger. The patient complained of no tenderness or abnormal sensitivity to palpation of these superficial muscles, and no guarding or tension was noted.

Third, the internal palpation of the muscles, including the levator ani (puborectalis, pubococcygeus, and iliococcygeus), coccygeus, and obturator internus was performed by inserting one finger inside the introitus and applying pressure to the muscles on the left and right sides. The patient complained of mild soreness with palpation of the PFM, specifically the bilateral levator ani and the left

obturator internus. Within the levator ani muscles bands of abnormal tension were palpated, and light twitching within the left obturator internus occasionally occurred when pressure was applied to this muscle.

Last, PFM strength was tested manually as described by Laycock and Jerwood.²² Based on an extensive review of the literature, manual palpation is the recommended technique for assessment of quality and correctness of a PFM contraction.²³ The assessment was done by having the patient attempt to squeeze the inserted gloved finger by contracting the PFM, and then attempting to pull the pelvic floor in a cephalad direction using those muscles. Then the patient was instructed to try relax the muscles completely following the contraction. The patient's strength was graded as fair (-), as a moderately weak contraction was palpable with very little cephalad movement of the pelvic floor. When asked to relax the muscles following contraction, no release of the contraction was appreciated, therefore the PFM resting tone was determined to be higher than normal at rest or overactive.

Clinical Impression #2

Overactivity that was found within the bilateral levator ani, left obturator internus, abdominal, and psoas muscles and the weakness found within the PFM support the clinical impression that was made based on history alone. Overactivity of the PFM has been shown to lead to weakness, fatigue, and sometimes pain when overloaded.¹² This patient's symptoms occurred with increase in activity, and her already overactive muscles were thought to be the cause.

This patient was an excellent candidate for the case report because of her history of endometriosis and continued presence of symptoms despite surgical removal of the lesions. The PT treatment plan was developed to address the overactive muscles with manual therapy in the clinic and instruction in techniques and exercises for the patient to perform daily at home. Following the examination, no further assessments or referrals to other specialists were deemed necessary, and the next step was to proceed with the agreed-upon plan of care.

Interventions

Manual therapy. Soft tissue mobilization (STM) and deep tissue mobilization/manipulation (DTM) were performed to restore normal length and tone to the psoas, rectus abdominis, gluteals, and levator ani muscles. Myofascial release (MFR) techniques and scar and connective tissue mobilization (CTM) were performed throughout the abdomen; surgical scars and areas of restriction of mobility within the abdominal connective tissue were targeted. The purpose of the manual therapy was to attempt to restore normal PFM resting tone, inhibit PFM overactivity, decrease muscle guarding within the abdominals, left psoas and piriformis, and bilateral gluteal muscles, and to improve scar and connective tissue mobility within the abdomen. Manual therapy has been shown to be an effective intervention for muscles carrying abnormal tension.^{12,18}

Relaxation techniques. The patient was provided instruction in deep breathing and relaxation exercises to improve body awareness of muscle tension. She was positioned supine with her lower legs elevated, hips slightly flexed and in external rotation. The patient was to inhale slowly and deeply, while focusing on expansion of her rib cage, rise of her abdomen, and descending of her pelvic floor. Then during exhalation, she was to allow her rib cage, abdomen, and pelvic floor to return to their starting positions. She was instructed to try to release any tension she felt anywhere in her body during this 5 minutes of relaxation and breathing and to perform this activity twice/day. The purpose of this breathing exercise was to promote mind-body awareness of tension the patient was subconsciously holding in the abdominal and pelvic regions. If able to release any perceived tension she was holding, she could potentially change the cycle of pain → tension → pain → tension, etc.^{24,25}

Self PFM manual therapy. The patient was instructed in use of a medium-sized vaginal dilator and the TheraWand for home manual therapy of the PFM. The patient was to use the TheraWand first; she was to apply pressure using the tapered end of the device to the areas within the pelvic floor muscles where she felt soreness or tension and to hold the pressure for 1 to 2 minutes. She would spend approximately 5 to 10 minutes on each side of the pelvic floor. After using the TheraWand she would insert the vaginal dilator fully and leave it in for 30 minutes while lying on her bed with a pillow under her knees. Both the TheraWand and vaginal dilator were to be used a minimum of once a day. The purpose of the TheraWand was to apply pressure to specific areas within the PFM to promote relaxation or lengthening in areas of the muscle that had become abnormally tense or shortened. The purpose of the dilator was to apply a uniform, sustained pressure to the PFM to promote normal length and tone and to inhibit overactivity of the PFM.^{15,16,26}

Walking program. The patient was instructed in a walking program, mainly because returning to walking without provocation or exacerbation of pain was one of her personal goals. She was advised to start with 15-20 minutes on level surfaces only and to gradually progress her duration and intensity of walking if she did not experience aggravation of her pelvic pain. The purpose of the walking program was to challenge the pelvic floor and other core muscles to promote gradual return to her previous daily activities.

After the third PT session, this patient reported aggravation of her symptoms that she attributed to the dilator use. She was advised to temporarily discontinue using the dilator until reassessment at the next visit. At the next PT session the patient reported that just prior to the onset of her pain, she had spent a day shopping and then a day standing and cooking. Internal re-assessment of the PFM revealed increased tension in the levator ani and worsening of the muscle spasm in the left obturator internus, possibly because of increasing her activity too aggressively and not taking enough time to do her home therapy. It was during this session that the importance of consistency of the home program was emphasized. The patient resumed use of the TheraWand and vaginal dilator, and her symptoms gradually resolved.

Hip stretching. The patient was instructed in an outer hip stretch. Lying on her back with legs extended, the patient brought her left knee across her body, and using her right hand she pulled the left knee in the direction of her right shoulder. She found the angle of the left hip and knee that gave her the best stretch of her left gluteals. She held the stretch for 30 seconds and performed the stretch 3 times, twice a day, plus immediately after walking. The purpose of this exercise was to reduce overactivity of the left gluteal and piriformis muscles to restore muscle balance within the lumbo-hip-pelvic complex.

Interventions not chosen. It was decided that this patient would not perform active pelvic floor muscle contractions or other core-specific exercises until her pain was resolved and remained stable. This decision was based on the fact that she had a tendency to hold abnormal tension throughout her abdominal muscles and pelvic floor throughout the day. Until normal resting tone was resolved, actively engaging these muscles more than what was needed for general daily activities could potentially lead to muscle spasm and pain, and this would delay her progress. The patient was instructed that once she was able to perform the desired activities without pain, she could begin to slowly increase core strengthening, including PFM, as long as symptoms did not return. Biofeedback was used in the office during a portion of two of the treatment sessions to help the patient visualize the overactivity of the PFM at rest, but biofeedback was not used as a regular part of treatment or in her home program once she learned how to release the abnormal tension with breathing, stretching, and use of the self PFM manual therapies. Rental of biofeedback equipment for home would have added expense for the patient that was not necessary.

The duration of each PT session was one hour, and the patient was seen for a total of 10 visits within four months. Occasional communication for update of the patient's status continued via email for approximately five months following her last visit, but no additional PT sessions were deemed necessary.

OUTCOMES

The patient was given two questionnaires, the Pelvic Floor Impact Questionnaire - Short Form 7 (PFIQ-7) and the Pelvic Floor Distress Inventory - Short Form 20 (PFDI - 20) with questions pertaining to bladder and bowel function and prolapse symptoms. Both of these tools attempt to quantify the impact that pelvic floor dysfunction has on quality of life. The patient opted not to complete the PFDI - 20, because she felt that the questions on this form did not pertain to her. In contrast, the PFIQ-7 focuses on how the bladder/rectum/vagina symptoms affect an individual's activities, relationships, and feelings, and patient felt that this questionnaire was relevant to her situation.²⁷

The PFIQ-7 scores before PT treatment were 0 for impact on bladder, 9.7 for impact on bowel, and 66.7 for impact on vagina/pelvic region. At time of discharge, the scores for bladder and bowel/rectum were unchanged, remaining at 0 and 9.7 respectively, but the score for vagina/pelvic impact had decreased to 28.7, indicating significant improvement. The scale for the Minimal Clinically Important Difference (MCID) for the PFIQ-7 is 36 points or 12% difference.¹⁸ Therefore, in this case, the 38 point difference indicated a clinically significant change.

Goals Prior to Treatment

The patient's main goals were to be able to work in her yard for up to three hours, take a walk for up to an hour, go on a moderate-intensity hike, stand for up to three hours while cooking, and engage in intercourse — all without pain. During the initial PT sessions, there was much discussion around the patient's anxiety and fear of the return of her pain. Reduction in the patient's emotional responses to the pain was a goal of the physical therapist.

Just before the patient was to be discharged, she reported a flare of her abdominal and pelvic pain. She had just returned from a two-week trip during which time she did not perform her home program. Despite the set-back, she was very pleased that during her travels, she tolerated much more walking than usual and engaged in intercourse without pain. Once home and in her normal routine again, she resumed daily performance of her home program and temporarily minimized prolonged walking and standing activities. Within a few days her symptoms disappeared completely and she was able to return to all activities without pain. She

was quite pleased that though she had experienced a flare of her symptoms, the duration and intensity were far less than with past episodes.

Goals Met

After ten sessions of pelvic PT, this patient stated that she felt much less anxious about her pain, and she had achieved her personal goals. Before beginning physical therapy, the patient reported that her pain averaged 5-6/10 and often escalated to 7-8/10 on a 0-10 pain rating scale, with 10 being the worst. At the time of her discharge from PT, she reported that her pain escalated to no more than 3-4/10, and this only occurred if she was significantly more active than usual. Her symptoms were well managed by her home therapies, and her pain rating averaged 0-1/10 most of the time. Five months following her discharge she reported continued improvement and felt significantly better than before she started pelvic PT.

DISCUSSION

Significant variation in symptom presentation among individuals with endometriosis often leads to inaccurate or delayed diagnosis. Yet, even when endometriosis is suspected, lack of awareness of all available interventions often results in mismanagement of the condition. For decades the main focuses in endometriosis care have been medical therapy and surgery; therefore, introducing pelvic PT as an effective adjunctive intervention for this condition can provide an option for rehabilitation.

Fitzgerald and Kotarinos' papers in 2002 and 2003 describing the "short" pelvic floor introduced a new dimension of pelvic PT that addressed PFM overactivity that is associated with dysfunction and pain.^{28,29} This concept of dysfunction because of overactive PFM is still not widely grasped by the medical community, most likely because the primary focus of pelvic PT has been to strengthen weak, under-active muscles to restore continence. However, in recent years we have learned much more about the PFM, including the correlation between PFM overactivity and various pelvic pain conditions. Upon examination, the overactive pelvic floor is found to be weak and tender to palpation, and manual therapy techniques that are used to restore normal tone to these muscles can lead to improved strength and function and diminished pain. Additionally, overactivity in other core muscles and restriction in mobility of connective and scar tissue can play a significant role in PFM dysfunction and pain. Therefore, manual therapy such as STM, DTM, MFR, and CTM to address these various tissues is an important part of pelvic PT intervention.³⁰

In a study by Weiss involving individuals with PFM overactivity who were experiencing symptoms of interstitial cystitis including urgency/frequency and pelvic pain, manual therapy was shown to be an effective intervention for significantly decreasing PFM overactivity that was associated with symptoms.³¹ The outcomes of the study not only helped to demonstrate the role that manual therapy plays in reducing PFM overactivity, but they also illustrated the potential role that dysfunctional PFM may play in pelvic pain.

Vaginal dilators and the TheraWand are tools that enable patients to perform manual techniques regularly at home rather than only receiving manual therapy during clinic sessions. These tools are very helpful in the gradual process of lengthening a shortened vagina and/or shortened PFM, releasing trigger points and/or myofascial restrictions, decreasing hypertonicity, and normalizing sensation. They are used in many pelvic PT practices internationally, and they have been shown to be an effective part of treatment for pelvic pain and dyspareunia.^{15,16,32-34}

The deep breathing and relaxation techniques that the patient performed at home were also helpful in promoting normal PFM tone. These techniques are used for a variety of conditions, including stress and pain management and relief of muscle tension. Breathing exercises, use of imagery and visualization, and conscious practice of mindful release of specific areas of muscle tension have all been shown to provide relief for chronic pain conditions.²⁵

One weakness of this case report was the fact that the patient was not screened for depression at the onset of treatment. The prevalence of anxiety and depression is high for individuals with chronic pain and with endometriosis.^{35,36} The patient's intake forms revealed a history of depression and indicated that she was taking prescription medication for depression. However, it was not known whether the medication or any other interventions were sufficiently addressing the depression.

Other areas of weakness of this case report are the lack of follow-up regarding the patient's bowel dysfunction and menopause symptoms. At the time of discharge from PT, the patient's outcome score in reference to bowel function was unchanged, yet no discussion occurred about management of the persistent bowel symptoms, such as referral to other specialists. It is also not known whether the patient's hot flashes that were initially because of medication, then later caused by surgically-induced menopause subsided, or if the patient simply did not mention them during the time she was participating in PT. Follow-up about

these symptoms was not reported but should be considered an important aspect of this patient's care; the effects of menopausal symptoms for some women can be extremely bothersome and have significant impact on their overall sense of well-being.³⁷

The prognosis for women who undergo laparoscopic excision of endometriosis post-operatively is quite good according to many studies, with reports of significant decrease in symptoms in as many as 80% of the participants.³⁸⁻³⁹ However, in cases where little or no change in pain following excision surgery is reported, it is often suggested that the persistence of symptoms is because of the presence of deep endometriosis lesions that were not successfully excised. The possibility of PFM overactivity or spasm as a potential cause of persistent pain is not always taken into consideration, despite the known fact that many women with endometriosis have PFD.⁴⁰ Performance of a PFM assessment as part of the patient examination is not mentioned in the large majority of endometriosis studies. Unfortunately, because of lack of thorough investigation into the source of the pelvic pain, it seems that currently not all treatment options are being offered to women who have symptoms suggestive of endometriosis or who have a known history of the condition.

There is evidence to support the existence of significant PFM spasm and dysfunction in women diagnosed with endometriosis.⁴⁰ Various sources provide evidence supporting the effectiveness of pelvic PT for addressing PFM spasm, overactivity, or high tone.^{41,42} A potential research project would be to compare functional outcomes of women who undergo laparoscopic excision of endometriosis who participate in post-surgical pelvic PT with those who do not. Further research will assist pelvic PT in becoming recognized as an important part of the standard of care for women with endometriosis.

REFERENCES

1. Audebert A, Bäckström T, Barlow DH, Benagiano G, Brosens I, et al. Medical treatment of symptomatic endometriosis. *Hum Reprod.* 1992 Mar;7(3):432-5. [PMID: 1350284]
2. Bloski T, Pierson R. Endometriosis and chronic pelvic pain. *Nurs Womens Health.* 2008 Oct;12(5):382-95. [PMID: 18837717]
3. Schenken RS. Treatment of human infertility: the special case of endometriosis. In: Adashi EY, Rock JA, Rosenwaks Z, editors. *Reproductive Endocrinology, Surgery, and Technology, Vol. 2.* Philadelphia: Lippincott-Raven; 1996. pp. 2121-40.
4. Wellbery C. Diagnosis and treatment of endometriosis. *Am Fam Physician.* 1999;60(6):1753-62. [PMID: 10537390]
5. Lemaire GS. More than just menstrual cramps: Symptoms and uncertainty among women with endometriosis. *JOGNN.* 2004;33(1):71-9. [PMID: 14971555]
6. Chopin N, Ballester M, Borghese B, Fauconnier A, Foulot H, et al. Relation between severity of dysmenorrhea and endometriosis. *Acta Obstet Gyn Scan.* 2006;85:1375-80. [PMID: 17091420]
7. Signorello LB, Harlow BL, Cramer DW, Spiegelman D, Hill JA. Epidemiologic determinants of endometriosis: a hospital-based case-control study. *Ann Epidemiol.* 1997;7(4):267-74. [PMID: 9177109]
8. Cox H, Henderson L, Andersen N, Cagliarini G, Ski C. Focus group study of endometriosis: struggle, loss and the medical merry-go-round. *Int J Nurs Pract.* 2003;9(1):2-9. [PMID: 12588614]
9. Doggweiler-Wiygul R. Urologic myofascial pain syndromes. *Curr Pain Headache Rep.* 2004 Dec;8(6):445-51. [PMID: 15509457]
10. Akuthota V, Nadler SF. Core strengthening. *Arch Phys Med Rehabil.* 2004 Mar;85(3 suppl 1):S86-92. [PMID: 15034861]
11. Tu FF, Holt J, Gonzales J, Fitzgerald CM. Physical therapy evaluation of patients with chronic pelvic pain: a controlled study. *AJOG.* 2008 Mar;198(3):272.e1-7. [PMID: 18313447]
12. Faubion SS, Shuster LT, Bharucha AE. Recognition and management of non-relaxing pelvic floor dysfunction. *Mayo Clin Proc.* 2012 Feb;87(2):187-93. [PMID: 22305030]
13. Fisher KA. Management of dyspareunia and associated levator ani muscle overactivity. *Phys Ther.* 2007 Jul;87(7):935-41. [PMID: 17472951]
14. *Introduction to the Guide to Physical Therapist Practice.* Guide to Physical Therapist Practice 3.0. Alexandria, VA: American Physical Therapy Association; 2014. Available at: <http://guidetoptpractice.apta.org/content/1/SEC1.body>. Accessed August 11, 2018.
15. *The TheraWand.* Available at: <https://pelvictherapies.com>. Accessed August 11, 2018.
16. *Vaginal Dilator Set.* Available at: <https://www.vaginismus.com>. Accessed August 11, 2018.
17. Utomo E, Blok BF, Steensma AB, Korfage JJ. Validation of Pelvic Floor Distress Inventory - 20 (PFDI - 20) and Pelvic Floor Impact Questionnaire - 7 (PFIQ - 7) in a Dutch Population. *Int Urogynecol J.* April 2014;25(4):531-44. [PMID: 24445668]

18. Barber MD, Chen Z, Lukacz E, Markland A, Wai C, et al. Further validation of the short form versions of the Pelvic Floor Distress Inventory (PFDI-20) and Pelvic Floor Impact Questionnaire (PFIQ-7). *Neurourol Urodyn*. 2011 Apr;30(4):541-6. [PMID: 21344495]
19. Vleeming A, Albert HB, Ostgaard HC, Sturesson B, Stuge B. European guidelines for the diagnosis and treatment of pelvic girdle pain. *Euro Spine J*. 2008;17(6):794-819. [PMID: 18259783]
20. Alpay Z, Saed GM, Diamond MP. Postoperative adhesions: from formation to prevention. *Semi Reprod Med*. 2008;26(4):313-21. [PMID: 18756408]
21. Weiss PM, Rich J, Swisher E. Pelvic floor spasm: the missing link in chronic pelvic pain. *Contemp Ob Gyn*. Oct 2012.
22. Laycock J, Jerwood D. Pelvic floor muscle assessment: the PERFECT scheme. *Physiotherapy*. December 2001;87(12):631-42. doi:[https://doi.org/10.1016/S0031-9406\(05\)61108-X](https://doi.org/10.1016/S0031-9406(05)61108-X).
23. Bo K, Sherbern M. Evaluation of pelvic floor-muscle function and strength. *Phys Ther*. March 2005;85(3):269-82. [PMID: 15733051]
24. Goncalves AV, Makuch MY, Setubal MS, Barros NF, Bahamondes L. A qualitative study on the practice of yoga for women with pain-associated endometriosis. *J Altern Complement Med*. Dec 2016;22(12):977-82. [PMID: 27552065]
25. Busch V, Magerl W, Kern U, Haas J, Hajak G, et al. The effect of deep and slow breathing on pain perception, autonomic activity, and mood processing-an experimental study. *Pain Medicine*. 2012;13:215-28. [PMID: 21939499]
26. Whitmore KE, Spadt SK. Vaginal dilation: when it's indicated and tips on teaching it. *OBG Manag*. 2012 December;24(12):12-8.
27. Barber MD, Walters MD, Bump RC. Short forms of two condition-specific quality of life questionnaires for women of Pelvic Floor Disorders (PFDI-20 and PFIQ-7). *Am J Obstet Gynecol*. 2005 July;193(1):103-113. [16021067]
28. Fitzgerald MP, Kotarinos R. Rehabilitation of the short pelvic floor. I: background and patient evaluation. *Int Urogynecol J* 2003;14:261-8. [PMID: 14530839]
29. Fitzgerald MP, Kotarinos R. Rehabilitation of the short pelvic floor. II: treatment of the patient with the short pelvic floor. *Int Urogynecol J*. 2003;14:269-75. [PMID: 14530840]
30. Wong YY, Smith RW, Koppenhaver S. Soft tissue mobilization to resolve chronic pain and dysfunction associated with postoperative abdominal and pelvic adhesions: a case report. *J Orthop Sports Phy Ther*. 2015 Dec;45(12):1006-16. [PMID: 26471853]
31. Weiss JM. Pelvic floor myofascial trigger points: manual therapy for interstitial cystitis and the urgency-frequency syndrome. *J Urol*. 2001;166(6):2226-31. [PMID: 11696740]
32. Kenway M. *Expert Techniques that Relieve Pelvic Floor Muscle Tension*. pelvicexercises.com.au website. Available at: <https://www.pelvicexercises.com.au/pelvic-floor-muscle-tension-article/>. Published July 15, 2012. Accessed August 11, 2018.
33. Hecht E. *Release Pelvic Pain in 2-3 months with Pelvic Floor Physical Therapy*. EMH Physical Therapy website. Available at: <http://www.emhphysicaltherapy.com/blog/page/5/>. Published January 4, 2013. Accessed August 2018.
34. *Physiotherapy*. vulvapainsociety.org website. Available at: <http://vulvapainsociety.org/vps/index.php/treatments/physiotherapy>. Published 2015. Accessed August 2018.
35. Lorencatto C, Petta CA, Navarro JM, Bahamondes L, Matos A. Depression in women with endometriosis with and without chronic pelvic pain. *Acta Obstet Gynecol Scand*. 2006;85:88-92. [PMID: 16521687]
36. Friedl F, Riedl D, Fessler S, Wildt L, Walter M, et al. Impact of endometriosis on quality of life, anxiety, and depression: an Austrian perspective. *Arch Gynecol Obstet*. 2015;292(6):1393-9. [PMID: 26112356]
37. Daly E, Gray A, Barlow D, McPherson K, Roche M, et al. Measuring the impact of menopausal symptoms on quality of life. *BMJ*. 1993;307:836. [PMID: 8401125]
38. Abbott J, Haew J, Hunter D, Holmes M, Finn P, et al. Laparoscopic excision of endometriosis: a randomized placebo controlled trial. *Fertil Steril*. 2004;82(4):878-84. [PMID: 15482763]
39. Bedaiwy MA, Barker NM. Evidence based surgical management of endometriosis. *Middle East Fertil Soc J*. March 2012;17(1):57-60. DOI:<https://doi.org/10.1016/j.mefs.2011.12.004>
40. Dos Bispo AP, Ploger C, Loureriro AF, Sata H, Kolpeman A, et al. Assessment of pelvic floor muscles in women with deep endometriosis. *Arch Gynecol Obstet*. 2016 Sept;294(3):519-23. [PMID: 26848858]
41. Polackwich AS, Li J, Shoskes DA. Patients With Pelvic Floor Muscle Spasm Have a Superior Response to Pelvic Floor Physical Therapy at Specialized Centers. *J Urol*. 2015 Oct;194(4):1002-6. [PMID: 25912491]
42. Oyama IA, Rejba A, Lukban JC, Fletcher E, Kellogg-Spadt S, et al. Modified Thiele massage as therapeutic intervention for female patients with interstitial cystitis and high-tone pelvic floor dysfunction. *Urology*. 2004 Nov;64(5):862-5. [PMID: 15533464]

