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Pain and Psychological Outcomes After Rehabilitative Treatment for a Woman With Chronic Pelvic Pain With Stage III Cervical Cancer: A Case Report

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Abstract

Background—Chronic pelvic pain and sexual dysfunction are adverse effects of treatment of cervical cancer. Surgery and radiation therapies may result in soft tissue pain and dysfunction, including spasms and trigger points of the pelvic floor muscles that result in pain. In addition to physical restrictions, negative mood associated with pain is believed to intensify and prolong the pain experience.

Study Design—The purpose of this case report was to describe outcomes of pelvic physical therapy in a 58-year-old woman with chronic pelvic pain after medical treatments for cervical cancer.

Case Description—The patient reported dyspareunia, hip pain, and lower abdominal, pelvic pain, and fatigue with activities lasting greater than 30 minutes. Interventions included pelvic floor massage, dilator use, and patient education. Symptoms were assessed at baseline and completion of physical therapy, using the Female Sexual Function Index, Fear of Pain Questionnaire–III, Pain Catastrophizing Scale, and Numerical Pain Rating Scale.

Outcomes—The Female Sexual Function Index score decreased from 7.8 to 2.8, the Fear of Pain Questionnaire– III score decreased from 85 to 73, the Pain Catastrophizing Scale score decreased from 18 to 8, and lower abdominal and pelvic pain decreased from 4 of 10 to 0 of 10, while bilateral hip pain remained at 4 of 10. In addition, she exhibited increased tolerance to mechanical pressure, evidenced by progression in size of a vaginal dilator.

Discussion—These results suggest that pelvic physical therapy may be useful in treating chronic pelvic pain after cervical cancer treatments and may also help decrease the magnitude of negative mood aspects such as pain-related fear and catastrophizing.

Keywords

cervical cancer; chronic pelvic pain; physical therapy; psychosocial pain factors

The author declares no conflicts of interest.

Sexual dysfunction and pelvic pain are adverse effects associated with medical treatment of cervical cancer in women,[1–3] and the prevalence of chronic pelvic pain (CPP) in survivors of cervical cancer is reported as high as 38%.[4] Women report increased vaginal dryness, decreased sexual desire and arousability, and pain with intercourse because of decreased vaginal diameter after surgical and radiation therapy interventions.[5,6] Although the pathophysiology of this pain is not well understood, internal scarring and adhesions secondary to surgery and radiation therapy may potentially cause pain and resulting dyspareunia. Pelvic pain and pain with intercourse are associated with decreased sexual intimacy and satisfaction. Although medical guidelines exist for the treatment of cervical cancer, no consensus exists on how to treat the pelvic pain that occurs after cancer treatments. Topical medications are among the recommended conservative interventions.[7] However, these treatments serve to mask the symptoms of pain instead of targeting potential sources of pain, including internal scarring and adhesions or psychological factors such as pain catastrophizing or pain-related fear.

Evidence suggests that pelvic floor muscle pain likely occurs as a result of surgical and radiation treatments for pelvic cancers.[4,5,8] Pelvic floor muscles affected by adhesions or inflammation caused by surgery or radiation may spasm, become shortened, and have trigger points, all of which are believed to result in pain.[9] Thus, physical therapists trained in pelvic floor rehabilitation are increasingly included as a part of the multidisciplinary treatment team for survivors of urogynecological cancers. Manual physical therapy interventions are commonly recommended conservative treatment options for soft tissue pain. Thiele massage, trigger point therapy, and scar releases are several common types of manual therapy interventions reported in the literature to treat pelvic pain in women. The mechanisms by which these interventions work are poorly understood, but these data suggest that manual or mechanical pressure assists in releasing scar tissue and adhesions, which help alleviate pain.[10–13]

In addition to anatomical factors, the available evidence suggest that psychological factors play an important role in the perception of pain, behaviors, and attitudes toward experimental and sexual stimuli in women with CPP.[14] Recent studies suggest that pain catastrophizing, fear of pain, and pain anxiety are potential contributors to the exacerbation of the pain experience. Kellner et al[15] reported that anxiety and depression were significantly higher in patients with pelvic pain and that these variables correlated significantly with hypochondriacal beliefs. The authors indicated that the psychological distress associated with pain symptoms may perpetuate the pain condition. More recent studies have examined the role of psychological variables as these relate to intercourse and sexual arousal. Brauer et al[16] reported that women with dyspareunia have more negative feelings about sexual intercourse and experience more threat of pain with sexual arousal than healthy women. Multiple authors have demonstrated that catastrophizing thoughts related to pain are associated with painful intercourse in women with vulvodynia.[17–19] Although these psychological factors have not been well-studied in a cohort of survivors of cervical cancer with pelvic pain, it is likely that some level of psychological distress related to their pain contributes to their pain experience.

Surprisingly, despite the growing evidence that manual therapy techniques may be helpful to treat pelvic pain in women without cancer, these interventions and their effects on the pelvic pain associated with cancer treatment and on pain-related psychological factors are not widely reported in the literature. The increasing number of female survivors of pelvic cancer in the United States necessitates effective conservative treatments that will improve both quality of life and sexual function. The purpose of this case report was to describe physical therapy treatment interventions for a woman with subjective pelvic pain and dyspareunia after chemotherapy, brachytherapy, and external-beam radiation therapy for stage IIIB squamous cell carcinoma of the cervix.

CASE DESCRIPTION

The patient was a 58-year-old woman with a diagnosis of stage IIB sqaumous cell carcinoma of the cervix. She was referred by her radiation oncologist to an outpatient physical therapy clinic in Gainesville, Florida. The indication for the referral was physical therapy consultation and pelvic floor rehabilitation. She completed chemotherapy, brachytherapy, and external-beam radiation therapy approximately 4 months before the start of physical therapy. She had no medical or surgical history other than the aforementioned treatments related to her cervical cancer.

The patient's symptoms included the following: fatigue, dyspareunia, pelvic and lower abdominal pain, chemotherapy port scar pain underneath the right clavicle, bilateral "hip" pain (greater trochanter location), and bilateral numbness and paresthesias of the soles of her feet. The patient reported dyspareunia since the end of radiation therapy. Her abdominal and pelvic pain occurred intermittently throughout the day, and the patient was unable to recall any events or movements that triggered this pain. The pain at the site of the patient's chemotherapy port scar occurred with horizontal abduction and overhead reaching with the right upper extremity. Hip pain occurred at night when the patient laid in a side-lying position on the ipsilateral side of pain. The patient reported fatigue with exertion or activity lasting greater than 30 minutes, which left her unable to return to work full time.

Clinical Impression #1

The patient's subjective information suggested movement-related pain with her upper extremity and intercourse-related pain in her pelvic region. On the basis of the cancer treatments she received and their potential effects on this patient's musculoskeletal system, she appeared to be an appropriate candidate for physical therapy.

EXAMINATION

Musculoskeletal Screen

Manual muscle testing of hip flexion, hip abduction, and knee extension was performed with the patient seated (hip flexion and knee extension) and side-lying (hip abduction). Hip flexion was measured bilaterally at 3+ of 5, while hip abduction and knee extension were measured at 4 of 5. The patient reported no pain with palpation of bilateral greater trochanters.

Neurological Screen—Sensation to light touch was intact bilaterally at dermatomes L2 through S2 except for the soles of the feet at which the patient reported numbness and paresthesias.

Pelvic Muscle Assessment—The examination was performed digitally with the patient supine with her knees bent and hips slightly abducted. Perineal sensation was intact to light touch. Palpation of the external pelvic diaphragm included the bilateral bulbospongiosus, ischiocavernosus, and transverse perineal muscles, in addition to the perineal body. Internal assessment included the following: clockwise palpation of vaginal introitus, bilateral palpation of the pubococcygeus, iliococcygeus, and ischiococcygeus muscles. The patient reported pain with the 6 through 12 o'clock locations of the vaginal introitus, in addition to pain with palpation of all right-sided pelvic floor muscles. The patient contracted her pelvic floor muscles with digital cueing, but her ability to maintain the contraction was poor.

Special Tests—The Ober test result was positive bilaterally. The Scour test result was negative bilaterally. These tests were performed to assess the integrity of the hip joint and iliotibial band tightness, given the patient's complaints of pain at the greater trochanters.

Clinical Impression #2—The patient's examination findings indicated pain to palpation of the right-sided pelvic floor muscles and right-sided vaginal introitus and weakness of bilateral hip flexors. In addition, she exhibited decreased flexibility of the bilateral tensor fascia latae. Sensation was intact in the vaginal region and lower extremities, except for the soles of the feet, which were likely effects of chemotherapy.

Outcome Measures—The following outcome measures were collected at 4 time points: initial evaluation (IE), 4 weeks post-IE, 10 weeks post-IE, and at discharge from physical therapy.

Fear of Pain Questionnaire–III: The Fear of Pain Questionnaire–III (FPQ-III) is a 30-item, 5-point rating scale developed to measure fear about specific situations that normally produce pain. Higher scores are indicative of higher levels of fear. The FPQ has good test-retest reliability (interclass correlation = 0.85-0.95).[20]

Female Sexual Function Index: The Female Sexual Function Index (FSFI) is a 19-item, 5-point self-report questionnaire used to assess 6 domains related to sexual function: sexual desire, arousal, lubrication, orgasm, satisfaction, and pain with intercourse. Lower scores are associated with higher sexual dysfunction. The FSFI has high test-retest reliability (r = 0.7-0.9).[21,22]

Functional Assessment of Chronic Illness Treatment–Fatigue: The Functional Assessment of Chronic Illness Treatment–Fatigue (FACIT-F) is a 13-item, 5-point self-report questionnaire used to assess physical and functional aspects of fatigue in individuals with cancer and other chronic illnesses. Lower scores are indicative of higher levels of fatigue. The FACIT-F has high test-retest reliability (interclass correlation = 0.95).[23]

Numerical Pain Rating Scale: The Numerical Pain Rating Scale is an 11-item self-report questionnaire used to assess pain intensity. The scale ranges from 0 (no pain) to 10 (worst imaginable pain), with higher scores indicative of increased pain intensity. The Numerical Pain Rating Scale is a reliable scale with good discriminative validity.[24,25]

Pain Catastrophizing Scale: The Pain Catastrophizing Scale (PCS) is a 13-item scale that measures pain catastrophizing in clinical and nonclinical populations under 3 domains: rumination, magnification, and helplessness. Higher scores are indicative of higher catastrophizing. The PCS is a reliable and valid measure (Cronbach $\alpha = 0.92$) with a stable factorial structure.[26,27]

Short Form–8: The Short Form–8 is an 8-item, 6-point self-report questionnaire used to assess health-related quality of life. Scores range from 0 to 100, and higher scores are indicative of higher levels of health-related quality of life. The Short Form–8 has good internal consistency.[28]

Pelvic Floor Muscle Strength: Pelvic floor muscle strength assessment is based on the Modified Oxford Grading Scale by Laylock.[29] This scale is used to evaluate pelvic floor muscle strength with digital palpation rated on a 0-to 5-point scale. This scale has moderate interrater reliability but questionable validity for scientific purposes. A score of 0 is described as “no muscle activity,” and a score of 5 is described as a “strong muscular contraction.”[29]

Intervention—The physical therapy intervention consisted of seven 1-hour visits over 12 weeks. Specific treatments included dilator education and instruction, pelvic floor muscle trigger point release, pelvic floor muscle Thiele massage, scar release, lower extremity flexibility and strengthening exercises, and aerobic conditioning. With the exception of dilator training and self-directed aerobic exercise at home, all other treatment interventions were performed in the clinic.

Dilator Education and Instruction: The patient was instructed in a daily home program with an extra small dilator (1.5-cm diameter), including preparation, insertion, and duration of dilator use. She was instructed to insert the dilator for approximately 10 minutes and gradually increase that time to 20 minutes every other day. With improved tolerance to static holding, the patient progressed to a dynamic dilator program that included repetitive gliding of the dilator to better simulate intercourse. The patient’s adherence in this home dilator program was evaluated at each visit, and dilator size was progressed as tolerated by the patient. By discharge, the patient was able to tolerate the largest dilator size of 3.5 cm in diameter.

Pelvic Floor Muscle Trigger Point Release and Thiele Massage[11,30]: The patient was laid in supine position with knees bent and hips slightly abducted. On the basis of the IE findings of tenderness to internal and external pelvic muscle palpation, trigger point release was provided for the right-sided internal pelvic floor muscles. Trigger point release included sustained pressure of one digit onto a specific painful region of a muscle for approximately 15 to 20 seconds at a time and comprised several minutes of the therapy sessions. Thiele

massage was performed vaginally by applying pressure with one digit along the length of the affected pelvic floor muscles. This procedure was performed for all right-sided pelvic floor muscles.

Scar release included myofascial release and scar massage of the chemotherapy port scar. The goals of the scar release were to loosen scar tissue, improve scar mobility, and decrease pain with right upper extremity movements. This technique was performed with the patient supine.

Lower extremity flexibility and strengthening included hip abductor strengthening, stretches for the piriformis, tensor fascia latae, and hamstring group muscles. Abductor strengthening involved sidestepping with theraband tied superior to the patient's lateral malleoli. All stretches were performed supine and bilaterally with a 30-second hold for each stretch.

Aerobic conditioning included a recumbent bicycle with use of both upper and lower extremity pedals. The patient rode the cycle for approximately 15 to 25 minutes at each visit at a goal of higher than 60 rotations per minute. This goal was based on the patient's perceived level of exertion, using the Borg Rating Scale of Perceived Exertion.[31] The patient was instructed to cycle at intensity such that her perceived level of exertion was 13 to 16 on the modified Borg scale. The intensity and duration of the patient's aerobic conditioning program were consistent with previously published studies that evaluated the impact of aerobic conditioning programs on cancer-related fatigue in women with breast cancer. No guidelines exist for the management of fatigue in women after treatment of cervical cancer. During aerobic conditioning the patient performed at home (primarily walking), she was instructed to use the same rating of perceived exertion.

RESULTS

The patient's FSFI score and FACIT-F scores decreased from baseline to discharge (see Table). The patient reported clinically meaningful decreases in lower abdominal and pelvic and chemotherapy port scar pain by discharge. The patient reported no change in her bilateral hip pain. The PCS score at the baseline assessment was 18 and decreased to 8 by discharge. The FPQ-III score decreased from 85 at baseline to 73 at discharge. The Short Form–8 score is composed of a Physical Component Scale and a Mental Component Scale. The patient improved her Physical Component Scale score by approximately 18 points and her Mental Component Scale score by 6 points. In contrast, the minimal detectable change for the physical component scale is 12.2 and is 12.8 for the mental component scale.[27] The patient's scores indicate a marked improvement in the Physical Component Scale after 10 weeks of treatment. Last, the patient improved her pelvic floor muscle strength by 1 grade.

DISCUSSION

This case demonstrates rehabilitative outcomes for a 58-year-old woman with CPP and hip pain who recently completed chemotherapy, external beam radiation therapy, and brachytherapy for stage III cervical cancer. The patient presented to outpatient physical therapy with complaints of dyspareunia and pain at her lower abdomen/anterior pelvic region, bilateral hips, and at the site of her chemotherapy port scar. She underwent 7

physical therapy sessions over the course of 12 weeks and demonstrated reductions in pain intensity and in levels of pain catastrophizing and pain-related fear. In addition, she demonstrated tolerance to progression in size of a vaginal dilator.

The patient demonstrated clinically significant[32] reductions in pain intensity of her chemotherapy port scar and lower abdomen but not of her bilateral hip pain. After 4 physical therapy sessions that included lower extremity and hip flexibility exercises, strength training, and hip joint mobility, the patient's hip pain did not reduce. She was referred for diagnostic imaging, which revealed osteoarthritis of her hips. Future studies may provide information about the prevalence of hip pain in women who are treated for cervical cancer. This information may warrant screening for and treatment of hip joint pathology.

In addition to reductions in pain intensity of her lower abdomen and chemotherapy port scar, the patient demonstrated reductions in levels of pain catastrophizing evidenced by lower scores on the FPQ-III and PCS. The 10-point difference in her base-line and discharge PCS scores was higher than the 9.1 minimal detectable change reported in patients with chronic low back pain,[20] indicating that the reduction in this patient's pain catastrophizing was beyond that of the measurement error previously reported with this tool.

Sexual function was an aspect of this patient's condition that did not improve with therapy. The patient's baseline FSFI score was indicative of sexual dysfunction, and the worsening of this score may be attributed to the fact that her partner's erectile dysfunction was diagnosed at approximately the same time she began therapy. As a result, they did not engage in intercourse throughout the 12 weeks of physical therapy. Because they did not have intercourse, the patient reported "no sexual activity" for the subscales of the FSFI related to Arousal, Lubrication, and Orgasm. Despite her scores on the FSFI, the patient improved her tolerance of vaginal dilators that increased in size throughout the course of therapy. She began using a 1.5-cm diameter dilator and progressed to a 3.5-cm diameter dilator. Given this improvement in her tolerance of vaginal penetration, it is unclear whether her sexual dysfunction demonstrated by the FSFI was caused by pain and intolerance of intercourse after cancer treatment or her partner's inability to have intercourse. It is likely that both of these issues contributed to the sexual dysfunction.

Fatigue is another issue that this patient experienced and actually increased from baseline to discharge, as evidenced by her FACIT-F scores. We were unable to treat this patient's cancer-related fatigue at the recommended aerobic training levels previously reported in the literature.[33,34] The patient experienced bleeding with moderate-to high-level intensity walking, most likely from irritation of her ureteral stent. Her urologist subsequently recommended that she not ambulate at these levels to avoid additional bleeding, and the patient ceased her home walking program.

This case study represents a novel view of outcomes for a woman treated for cervical cancer who reported to physical therapy with impairments related to pain and sexual dysfunction, in addition to the presence of pain-related psychological variables. The literature that addresses conservative interventions for CPP often includes pain conditions such as including endometriosis, vulvodynia, painful bladder syndrome, and/or postsurgical pain. Although

the community prevalence of CPP is estimated at nearly 15%[35] and primary care prevalence estimates are comparable to that of low back pain and asthma,[36] these estimates do not necessarily include women who have undergone treatment of cervical cancer and the true prevalence of CPP may be higher. The improvement in survival rates and early detection of cervical cancer necessitate the need for interventions directed at improving quality of life after cervical cancer treatments.

The patient presented to physical therapy with pain of multiple body regions, elevated levels of pain catastrophizing, and sexual dysfunction. Sexual dysfunction, pelvic pain, and psychological distress are adverse effects associated with cervical cancer treatment,[1–5] and health care professionals trained to address these areas should be part of the multidisciplinary care of these patients. Patients may benefit from a dynamic dilator use program before reporting pain with intercourse and to prevent further narrowing of the vaginal opening. Speaking with a sexual therapist before having intimacy issues and psychological distress known to occur as a result of cervical cancer treatment may be helpful for both the patient and her partner. Future studies should assess the efficacy of specific interventions targeted at pain, sexual dysfunction, psychological distress, and health-related quality of life in women who have undergone radiation and chemotherapy for cervical cancer.

Limitations

This study was a single-subject case report, and the ability to generalize these outcomes to the population of women who have undergone treatment of cervical cancer is limited.

Another limitation of this report is that we were unable to directly address the patient's sexual function secondary to the diagnosis of her partner's erectile dysfunction.

Although her levels of pain intensity and pain catastrophizing improved with 7 physical therapy sessions, sexual dysfunction may have been better addressed with a referral to a sexual therapist. Sexual therapists may be helpful in addressing low libido or arousal problems, in addition to the effect of sexual dysfunction on intimate relationships.[37,38] The patient in this case, however, deferred this referral as she did not think she needed to speak with a sexual therapist.

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Table 1

Assessment of Patient Outcomes

	Baseline	Week 4	Week 10	Discharge
Female Sexual Function Index	7.6	7.6	2.8	2.8
Fear of Pain Questionnaire–III	85	69	70	73
Functional Assessment of Chronic Illness Therapy–Fatigue	21	14	17	16
Numerical Pain Rating Scale				
Lower abdominal and pelvic pain	4	4	2	0
Bilateral hip pain	4	7	4	4
Chemotherapy scar pain	4	2	0	0
Pain Catastrophizing Scale	18	6	10	8
Short Form–8				
Physical Component Scale	43.1	37.5	31.3	34
Mental Component Scale	40.8	36.9	45	40.2
Pelvic Floor Muscle Strength	2/5	3/5	NA[a]	3/5

Abbreviation: NA, not applicable.

[a]Pelvic floor muscle strength was not tested at Week 10 secondary to patient's report of vaginal bleeding.