

Prevention and treatment of vaginal stenosis resulting from pelvic radiation therapy

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Pelvic radiation therapy is an integral part of treatment for both cervical and colorectal cancer. Fortunately, many women treated for these cancers are cured. Unfortunately, as a consequence of therapy, as many as 88% of those treated for cervical cancer and other gynecologic malignancies develop vaginal stenosis, which can result in long-term sexual dysfunction. The number of women who develop vaginal stenosis following treatment for colorectal cancer is not well reported. Although there is no definitive treatment or preventive, several measures are available to counter this toxicity. An open and honest dialogue between healthcare providers and patients is vital.

The American Cancer Society estimates there will be more than 74,000 new cases of colorectal cancer in women and 9,700 new cases of cervical cancer in the United States in 2006.¹ Curative treatment for many of these women will include pelvic radiotherapy of some prescription. Fortunately, many of these women will be cured of their cancer. But as a result of treatment, many will suffer side effects that can have a lasting impact on quality of life. Vaginal stenosis, which can result in sexual dysfunction, is one such effect that has received little attention in the literature.

Although there are fewer cases of cervical cancer than colorectal cancer, for several reasons, more is written about vaginal stenosis in cervical cancer survivors. For example, pelvic radiation has been a major treatment for cervical cancer for more than 60 years; its use in the treatment of colorectal cancer has become common only over the past 20–30 years. Pelvic radiation for other gynecologic malignancies, such as endometrial cancer, vulvar cancer, and vaginal cancer, can also lead to vaginal stenosis. Another reason there is less written about vaginal stenosis in women treated for colorectal cancer may be because women with gynecologic cancers are treated by gynecologists, who pay more attention to genital and sexual health, by both history and physical exam.

In 1962, Decker and Schwartzman acknowl-

KEY POINTS

Up to 88% of women treated with pelvic radiation for cervical cancer develop vaginal stenosis as a consequence of therapy. The percentage of women who develop vaginal stenosis after radiation therapy for colorectal cancers is not well reported.

Vaginal stenosis can lead to long-term effects on sexual activity, including vaginal dryness, pain, and dyspareunia. This problem can have a negative impact on the quality of life of survivors.

Potential measures to prevent and treat stenosis are topical estrogen, topical benzydamine, systemic hormones, and vaginal dilators.

To minimize the consequences of vaginal stenosis, it's essential that clinicians have a thorough discussion with patients about the potential for this side effect, and ways to treat it before, during, and after radiation therapy.

Vaginal stenosis is an important survivorship issue that warrants additional study.

edged sexual dysfunction as a consequence of treatment of cervical cancer. They recognized this as a problem that had received little attention.² Unfortunately, it still

Manuscript received May 30, 2006; accepted September 26, 2006.

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Commun Oncol 2006;3:665–671 © 2006 Elsevier Inc. All rights reserved.

receives little attention today. One of the few papers to address sexual dysfunction after treatment for colorectal cancer included only 121 patients, 48 of whom were women. This study, by Mannaerts et al, reported a significant decrease in the ability to reach orgasm and in the quality of orgasm, as well as an increase in discomfort during intercourse, after multimodality treatment for locally advanced or recurrent rectal cancer. The study found a decrease in sexual activity for both men and women after therapy, with more sexual dysfunction reported both pre- and post-treatment for women than for men.³

The incidence of vaginal stenosis reported in the literature after treatment for cervical cancer ranges from 12% to 88%.^{4,5} Studies that address vaginal stenosis as a specific toxicity report higher incidences than those that just report toxicity from the treatment of cervical cancer. This underscores the fact that the definition of significant vaginal stenosis will vary from study to study. Nunns et al describe vaginal stenosis as the inability to pass two fingers into the vagina.⁶ Other authors have defined stenosis according to vaginal length, with stenosis defined as length < 8 or 9 cm.^{7,8} Some have tried to grade stenosis based on vaginal mucosal changes⁹ or portion of the vagina that is stenosed.⁵ All of these studies were in women treated for cervical cancer, and although vaginal stenosis is also common in those treated for colorectal cancer, especially rectal cancers, the part of the vagina affected differs. In cervical cancer treatment, the stenosis is most often thought to be associated with brachytherapy, and therefore the upper vagina is the most affected.^{8,10} In rectal cancer, it is usually the lower portion of the vagina that receives a high dose of radiation; therefore the lower vagina, vaginal introitus, and vulva are affected. This can cause narrowing at the vaginal opening with a relatively normal vaginal length. It may be this narrowing that leads to dyspareunia.

Mannaerts et al reported an increase in the loss of interest of sexual activity af-

ter treatment from 26% to 63% in women treated with multimodality therapy for rectal cancer.³ Schover et al reported that by one year after treatment, more dyspareunia and problems with sexual desire were noted in women with cervical cancer treated with radiation therapy compared with those treated by radical hysterectomy.⁹ If not addressed, the problem only compounds itself over time. Women who experience painful intercourse will probably be less likely to pursue vaginal sexual activity, and less use of the vagina can lead to further shortening and narrowing, though there is little formal literature adequately covering this problem.

As more and more patients are surviving cancer today, addressing survivorship issues is imperative. As with most potential toxicities from therapy, discussing the issue with patients is the most important first step. If a woman knows what to expect, she will be better prepared to deal with and prevent the toxicity, which can have lifetime effects on her quality of life.

Prevention and treatment of vaginal stenosis after pelvic radiation

Topical estrogen therapy

As an immediate response to radiation therapy, there is loss of most of the epithelium of the vagina receiving the maximal surface dose. This loss lasts for the first 3–6 months following radiation. In addition, the re-epithelialization that occurs after radiation leaves the surface thin and with an incomplete layer of basal cells.¹¹ Using topical estrogen after completing radiation therapy can promote epithelial regeneration; its effects may be even greater for patients more than 3 months after radiation.

In 1971, Pitkin and Van Voorhis reported a controlled double-blinded study of 93 women receiving radiation therapy for cervical cancer. After completing therapy, women were given vaginal cream, which either did

or did not contain 0.01% dienestrol. They were to insert one applicator of cream into the vagina at night 3 times a week until the cream was finished (6–9 months). At the end of the study, women who received estrogen cream had significantly less dyspareunia and were twice as likely to have normal vaginal caliber as those who received placebo.¹² Side effects were not included in the report. In 1980, Hintz et al studied a smaller group of women, both pre- and postmenopausal, and found similar results. In addition, they reported that 2 weeks of using vaginal estrogen cream nightly led to increased plasma levels of estrogen. Therefore, if estrogen is contraindicated systemically, topical use of estrogens also should be avoided.¹³

Systemic estrogens

No study has specifically evaluated the use of systemic estrogens for prevention or treatment of vaginal stenosis after pelvic radiation. However, pelvic radiation renders most premenopausal women menopausal because of the proximity and sensitivity of the ovaries to radiation. Therefore, women who will undergo irradiation require counseling regarding potential benefits versus risks of hormone therapy. Our routine is to offer hormone replacement for all premenopausal women treated with radiotherapy for cervical cancer beginning around the third week of radiation therapy (20–22 Gy). Although not reported in the literature, my own informal survey of reproductive endocrinologists supports the use of hormonal therapy in these patients until the normal age of menopause (average of 52 years in the United States). Women with the uterus in situ require both estrogen and progesterone to minimize the possibility of developing endometrial hyperplasia or carcinoma.

Topical benzydamine

Two studies conducted prospectively in a blinded manner evaluated the

use of topical benzydamine as anti-inflammatory treatment for acute radiation vaginitis in women after receiving brachytherapy for cervical cancer. In 1981, Bentivoglio and Diani treated 30 patients with a vaginal douche containing benzydamine or placebo for 15 days beginning 12–24 hours after completing brachytherapy. They reported a significant decrease in symptoms (pain, pruritus, tension, burning sensation, vaginal tenderness, and edema) from 90% in the control group to 26% in the treated group.¹⁴ Similarly, in 1987, Volterrani et al randomized 26 patients to a similar regimen and also found the treated group had a significant decrease in symptoms, as well as significant improvement in colposcopic appearance of the cervix and vagina.¹⁵ Neither study reported side effects or measurements of quality of life. These studies support the

use of topical benzydamine for treatment of acute radiation vaginitis. Long-term benefits have not been reported.

Vaginal dilators

Although the use of vaginal dilators is often recommended for prevention of vaginal stenosis, only a few studies evaluating their effectiveness have been published. In 1980, Poma reported a retrospective case series of five women who developed complete vaginal stenosis after radiotherapy for cervical cancer. The intervention was digital pressure to the introitus until pain, twice a day, with the application of Premarin cream for 6–8 weeks. All five patients had improvements with minimum dimensions obtained of 10 cm in length and 3 cm in width. All were able to resume sexual intercourse with a return of vaginal function. No

assessment of side effects or impact on quality of life was reported.¹⁶

Decruze et al reported in 1999 a retrospective case series of 35 women using vaginal stents after brachytherapy for cervical cancer with historic control prior to the development of the stent. After completion of radiation therapy, patients were instructed to use the stent once daily for a year, whether or not they were sexually active. Controls were advised to resume regular sexual intercourse to maintain vaginal patency. Cases were assessed at 6 weeks and then every 3 months to determine vaginal dimensions. Results showed that 54% of controls versus 11% of cases (using stents) had evidence of stenosis at follow-up, although there was no stenosis in the women who used the stents correctly. Side effects and impact on quality of

CASE 1

A 36-YEAR-OLD who has given birth three times is treated with post-operative pelvic radiation for rectal cancer. Radiation included 45 Gy to the lower pelvis with most of the distal third of the vagina in the field. Six months after completing all treatment, the patient was without evidence of disease but was experiencing painful intercourse, for which she was referred to the gynecologist. Pelvic examination revealed a narrowing of the vaginal opening just inside the introitus with radiation changes visible on the vaginal mucosa. The upper vagina and cervix appear normal. Questioning reveals that the patient has not had a menses since completing therapy and has not been on any hormonal therapy. No discussion of topical therapy or use of vaginal dilators has been conducted with her.

For this patient, some time has already been lost, but it is not too late to start her on topical vaginal estrogen cream 2–3 times a week and assess her vaginal length for use of a dilator.

Most important for her is getting a dilator that she can pass through the introitus. I would start treatment with a small silicone vaginal dilator covered with water-based vaginal lubricant or estrogen cream to be used for 15 minutes 3 times a week. Let the patient know this may be uncomfortable at first, but that she should be persistent. I would reassess her after 4–6 weeks to see if a larger dilator will fit. As soon as she is comfortable with a dilator, without pain, I would encourage her to begin trying intercourse again. I would advise indefinite use of the dilator and also discuss the pros and cons of systemic hormone replacement. This patient would require both estrogen and progesterone.

CASE 2

A 42-YEAR-OLD is treated with chemotherapy and pelvic radiation for locally advanced cervical cancer. When discussing treatment, I would include that fact that she will undergo menopause sometime during therapy, usually in the third to fourth week of radiation. Also, she should be advised that there

is the potential of vaginal shortening and narrowing from the treatment, but that we will do everything we can to prevent it. Ideally, there should be some discussion of her current/prior sexual function. This is difficult sometimes because the patient has cancer in her genital organs and may be uncomfortable discussing her sex life. This makes it imperative that the healthcare provider be comfortable and open when discussing personal issues, so the patient herself can be at ease. We would then plan for an assessment of her vagina immediately following completion of radiation and prepare to start her on topical therapy with estrogen and benzydamine as needed. I would also fit her for a dilator at that visit and instruct her on its use. I generally see patients again 1 month after completing therapy, and assessment of vaginal function is done again at that time and at every follow-up visit thereafter. Continued assessment of sexual function and encouragement to continue use of the dilator is imperative.

life were not reported.¹⁷

From these studies, it appears that some form of vaginal dilation can both help prevent stenosis and treat established stenosis. Also, therapeutic intervention appears to be superior to “regular sexual intercourse” alone. Potential drawbacks to the use of vaginal dilators include the need to choose the best dilator size, shape, and composition suitable for the woman as well as the need to provide correct instruction on its use. How often and how long to use the dilators is also not known. We recommend using dilators soon after completing therapy for 15–20 minutes at a time 2–3 times a week.

When patients ask me how long they need to continue, I tell them it is a life-long commitment. Many patients do not resume regular vaginal intercourse after radiation therapy for many reasons. These can include fear of pain, fear of cancer recurrence, lack of desire, or lack of a partner. As all of these factors can change, keeping the vagina open for future use is key. In addition, patients should not have to “use” intercourse as a method to keep the vagina open. Even if women are sexually active after radiation, they should not associate intercourse with the need to keep the vagina open. That is the purpose of continued use of the dilator. For women surviving cervical cancer, it is important to keep the vagina open not just for intercourse but also for gynecologic examinations and continued Pap smears needed to evaluate for recurrence.

Surgical intervention

There are several retrospective reviews of surgical intervention for vaginal stenosis or shortening as a result of pelvic radiation. Most report the use of split-thickness skin grafts to lengthen a foreshortened vagina after treatment for gynecologic cancers.^{18–20} A few evaluate using myocutaneous grafts to reconstruct the perineum and/or posterior vagina after treatment for anal or rectal cancer.^{21–23} All report varying degrees of functional capacity, but duration of re-

sponse or follow-up is not consistently demonstrated. They are all small series with inherent bias and no comment can be made on the results. It is difficult to assess the risks and benefits of these procedures, and although the best way to assess the benefit of reconstructive techniques would be through prospective and objective comparisons, none are available or are likely to be done. Tissue healing in an irradiated field is always compromised, and a general rule is to avoid surgery as an alternative for improving vaginal stenosis unless all other measures have failed.

Conclusion

Vaginal stenosis is a common yet infrequently discussed side effect of pelvic radiation used to treat gynecologic and colorectal cancers. Although there is no proven measure to treat or prevent this condition, early discussion of options and early intervention for symptoms seems prudent. An introduction of the possibility of vaginal changes as well as a change in menopausal status is indicated early on in the discussion of treatment with women who need pelvic radiation. Some pretreatment assessment of sexual function and activity should be made. This should include pretreatment measurement of vaginal length and width.

Premenopausal women should be informed about the risks and benefits of estrogen/progesterone use. As soon as radiotherapy is concluded, topical treatment with estrogen cream and/or benzydamine can decrease symptoms, and continued use of estrogen cream (unless contraindicated) can improve vaginal epithelialization. Instructions on the use of a vaginal dilator also should begin soon after completion of treatment. The size, width, and composition of the dilator should be individualized based on pretreatment assessment of the vagina. Ideally, use of the dilator should continue indefinitely.

Follow-up should include continual reassessment of vaginal and sexual function and continued dialogue

among the patient and all members of the healthcare team, including gynecologists, radiation therapists, and medical oncologists, as well as nurses and psychologists.

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Community Experience

Strategies for helping patients manage the side effects of pelvic radiation therapy

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"I couldn't even sit down to drive myself to radiation therapy after the fourth week. I couldn't urinate or have a bowel movement without pain. Thank goodness my parents could drive me to radiation therapy while I sat on a donut or lay down in the back seat, medicated with narcotics to dull the shearing pains at each bounce in the highway. For 2 months after the therapy my vagina was so raw I couldn't even think about having sex, and 8 months later, intercourse is still too painful. I'm exhausted and need help.

"I wish I had known it would be this bad. I want to know how and when I am going to get better. The radiation oncologist told me to use dilators during therapy but I was just too sore to do that. I don't know where to get them or even how to use them. I had such diarrhea and poor bowel control I couldn't return to my teaching job for 8 months. Can you imagine having to run to the bathroom from my 4th grade classroom? It's just not possible. But I didn't realize I'd need to arrange a long-term substitute and plan my finances accordingly."

So began a medical oncology follow-up visit for my 42-year-old patient who is likely cured of her anal cancer after combined modality chemoradiotherapy, but who clearly had not received the kind of comprehensive education, preparation, and supportive care that should be available to women in her situation. Thus chastised, I promised my patient that with her help, I would work to develop tools to better educate and support women who need pelvic radiation therapy.

Unfortunately, I found no detailed information in the currently available patient support literature. I sought advice from the Oncology Nursing Society textbooks we have and just found recommendations for water-based lubricants and dilators after therapy. In another textbook, published in 1996 by Jones and Bartlett and titled *Cancer Symptom Management*, I was frustrated to find that their only advice to patients was to resume intercourse 3 times a week after radiation therapy to prevent vaginal stenosis. My immediate thought was, "You've got to be kidding! My patients can't even sit down, urinate, or defecate without pain and there is no way she can resume intercourse 3 times a week! I need to find more practical advice for her."

Action items

Pretreatment education and informed consent

All of our patients treated with chemotherapy or radiation meet one-on-one with a member of our practice for a consultation that includes oral and written education, a discussion of informed consent, and signing of a consent form. We have developed a formal teaching tool in the form of a questionnaire on our ARIA (Varian) electronic medical records system, which the nurses use to ensure that all aspects of treatment and potential side effects are discussed with patients and documented. Currently, we offer counseling for premenopausal women on the risk of early menopause as a result of chemotherapy and pelvic radiation.

As advised by Dr. Wolf, we have added a prompt on ARIA for sexuality and urinary and bowel function, and are adding a section on vaginal health impacts, as well as advice for vaginal lubricants, estrogen creams, dilator use, and pain control during pelvic radiation therapy. We will present our patient education handout (see box on page 670) at our monthly group-wide oncology nursing meetings to ensure that all our nurses are educated on these topics. The

handout will serve as part of an extended informed consent process to help patients better understand potential side effects.

The patient education sheet is a vital resource before, during, and after therapy. We are adding it to our group-wide computer network so our practitioners can access it easily for patients, and will place it on our Web site so that patients can download it on demand (also available at www.CommunityOncology.net/0310.html).

We are urging our patients to talk with their gynecologist or primary care doctor before starting radiation therapy to discuss sexuality, use of dilators or hormonal creams during therapy if possible, use of the dilators and creams as soon as possible after initial mucosal healing, and regular follow-up to better coordinate supportive care during and after pelvic radiation therapy. We will send our notes, with a copy of the patient handout and Dr. Wolf's article, to our patients' other doctors so they can be armed with information on managing and supporting patients through the expected side effects.

Tumor board presentation

My colleagues or I will arrange to present the educational handout and Dr. Wolf's article to our colleagues at

our local hospitals' tumor boards.

Treatment holiday

Although most physicians are reluctant to interrupt therapy, some of these women really do require a

break. Radiation oncologist Margaret Barnes, MD, of Gillette, Wyoming, recommends offering patients a long weekend off—3 to 4 days, rather than a full week. This short hiatus often allows the tissues to heal a little so that

pain decreases and the patient gets a psychological lift.

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Patient guide to coping with pelvic radiation side effects

Download at: www.CommunityOncology.net/0310.html

As part of your cancer therapy, your doctors have prescribed radiation to the pelvic area. This pamphlet describes the side effects you may experience and the many techniques that will help you cope with them. Note that after the first 2 or 3 weeks of radiation treatment, you should arrange to have a friend or family member drive you to and from your treatment, especially if you are too uncomfortable to sit or are taking pain medications that can slow your reactions and impair your driving.

If you are still menstruating before treatment, radiation with or without chemotherapy may stop your periods, leading to a permanent or temporary menopause. Some women experience hot flashes, vaginal dryness, loss of libido (interest in sex), mood swings, depression, or sleep disturbances. If your cancer is not influenced by hormones, your gynecologist or primary care doctor can prescribe hormone replacement therapy to ease the symptoms of menopause.

Radiation treatment, which normally takes 5 to 6 weeks, leads to other side effects in the sensitive areas of the vagina and rectum. Soreness in these areas can begin in the second or third week of radiation treatment and can last 6 to 12 weeks after treatment ends. Depending on your sensitivity to radiation, you may experience redness, swelling, or blistering in the vaginal and rectal areas.

If you experience pain when sitting, urinating, or having bowel

movements, **talk to your primary care doctor or radiation therapist about pain medication.** Unrelieved pain can cause distress and delay healing, but you can and should be helped. In addition to pain pills, there are a number of steps you can take:

To make bowel movements more comfortable, consult with your doctor about:

Over-the-counter stool softeners such as docusate sodium (Colace), Senokot, bisacodyl (Dulcolax), magnesium hydroxide (milk of magnesia), or Metamucil. A prescription-only powder laxative called MiraLax can also help.

Oralcholestyramine (Questran), a prescription drug that can help make stools less acidic so they don't sting as much when you move your bowels.

Xylocaine (2%) in a tube, which comes with an anal applicator. A squirt of this topical anesthetic in the anus just before a bowel movement can numb the anus, and make the bowel movement tolerable.

Prescription-strength cortisone rectal suppository, such as Anusol HC 2.5% twice daily.

A prescription medication called Belladonna & Opium Suppositories. Inserted in the rectum, this suppository gives local pain relief, easing bowel spasm and the sensation of having to move the bowels. Before inserting the suppository, use Xylocaine gel first to numb the anus.

Maintaining a high-fiber diet by eating plenty of grains, beans, and

vegetables such as cauliflower or broccoli.

Drinking plenty of fluids.

To ease soreness of vaginal or rectal skin:

- Use non-prescription ointments such as Eucerin or A&D for soreness in small areas.

- Avoid diaper rash products, such as Desitin and Calendula, as they are usually very high in zinc, which can worsen the burn.

- Avoid over-the-counter cortisone creams, which usually will not help and can sting. If you do use cortisone, combine "fluorinated" cortisone, such as triamcinolone (available by prescription) with a petroleum-based ointment such as Vaseline.

It's important to take **warm "sitz baths"—soothing soaks**—to help cleanse the skin between the vagina and rectum (the perineum), especially after urination or a bowel movement. You can take 3 to 4 sitz baths a day, as needed. (You can also use baby wipes or a squirt bottle with warm water to cleanse and soothe the area.)

For mild discomfort, mix a small amount of Epsom salt in the bath water.

For more severe reactions, use Domeboro's solution, a pre-measured powder that is found in pharmacies with over-the-counter medications for poison ivy. Mix one packet of Domeboro's with warm water and soak for 3–5 minutes.

You can also use Milk of Magnesia (or unflavored Mylanta) in your

sitz bath. This preparation can calm burning in and around the perineum, just as it does with stomach acid.

After a sitz bath, dry the area with a hair dryer set on cool. If you use a towel, pat dry, do not rub.

If you experience burning when you urinate, first have your doctor check to make sure you don't have a urinary tract infection, which may require antibiotic treatment. Then talk to your doctor about a prescription for urinary anesthetics such as phenazopyridine (Pyridium and others) or Urised, a combination of antiseptics.

If side effects are affecting your ability to have sex

Radiation to the pelvis can cause vaginal tissues to become dry, sore, and inflamed. The onset of menopause can add to these symptoms because of lowered levels of the female hormone estrogen. As a result, the vagina can contract and shorten, which can make intercourse painful.

Even if you are not sexually active, it is important to keep the vaginal tissues elastic for your general health and for future pelvic examinations. Your gynecologist, primary care doctor, or oncologist can help. **Here are some treatment options:**

Hormone replacement Prescription estrogen or **estrogen/progester-**

one creams can be used directly on the vagina to reduce dryness and keep the vaginal tissues moist and pliable for health and sexual activity. You can also use a hormone suppository—a capsule that dissolves in the vagina. Talk to your doctor about using **creams, pills, or patches** for local or whole body hormone replacement depending on your symptoms.

Vaginal dilators Dilators are a set of metal or plastic rods of differing sizes that can be inserted with lubrication or estrogen cream to keep the vagina from scarring or shortening. The dilators work by slowly stretching the vagina.

Where to obtain the dilators:

Dilators can be made inexpensively out of the plastic cases that some suppliers send for individually packaged syringes. Ask your nurse about the cases that fit sizes 1cc, 5cc, 10cc, 20cc, 30cc, and 60cc. Simply wash the cases before using.

Dilators can also be purchased from various companies without a prescription:

- Soul Source Enterprises
www.soulsourceenterprises.com
503-750-1802
- Vaginismus.com
www.vaginismus.com
1-888-426-9900
- Duratek Plastics
www.duratek.sk.ca/documents/1095.html
306-374-3161

Coping with painful intercourse

Although it's safe to have intercourse during radiation therapy, many women find that they are in too much discomfort to have sex until the tissues have healed, usually within 4 to 6 months after completing radiation treatments. Until you are ready, here are some ways to approach this issue:

Involve your partner. Help your sexual partner understand what you are going through and how you are feeling. Consider other sexual activities and intimate acts such as oral sex, hand-to-genital stimulation, and skin-on-skin cuddling.

Go slowly. Create a calm environment in the bedroom. Use over-the-counter lubricants such as KY Jelly. Consider incorporating dilators into your sexual activity until you are ready for penile penetration.

Contact a support group. There are a number of organizations that can help with face-to-face, online, or telephone support, including:

- CancerCare
www.cancercare.org
800-813-4673
- The Wellness Community
www.thewellnesscommunity.org
888-793-9355
- The American Cancer Society
www.cancer.org
800-227-2345

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Conflicts of interest: None disclosed.