

What happened?

Sexual consequences of prostate cancer and its treatment

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ABSTRACT

OBJECTIVE To describe the sexual consequences of prostate cancer and its treatments (prostatectomy, external beam radiation, brachytherapy, androgen deprivation therapy) and to suggest treatments for sexual side effects of these therapies.

QUALITY OF EVIDENCE Most studies of the sexual consequences of prostate cancer treatments and studies of therapy for these side effects provide level II evidence.

MAIN MESSAGE Diagnosis of prostate cancer in itself can cause sexual dysfunction. All forms of treatment for this cancer cause serious sexual problems for men. Treatments for the erectile dysfunction that results have varying success rates. Prostatectomy has been shown to cause erectile dysfunction in 30% to 98% of men, depending on whether both, one, or neither nerve bundles was spared. Radiation therapy results in erectile dysfunction in more than 70% of those treated; brachytherapy produces the least amount of sexual deficit. Hormone ablation therapy has serious consequences: more than 80% of men report loss of erections at 1 year after therapy in addition to profound loss of libido.

CONCLUSION Family physicians are ideally placed to provide anticipatory guidance to men with prostate cancer on the sexual consequences of both the cancer and its treatments. Family physicians can also assist men and their partners in managing these sexual side effects.

RÉSUMÉ

OBJECTIF Décrire les conséquences d'ordre sexuel du cancer de la prostate et de son traitement (prostatectomie, irradiation externe, curiethérapie, traitement anti-androgénique) et proposer des traitements des effets secondaires sexuels causés par ces traitements.

QUALITÉ DES PREUVES La plupart des études sur les conséquences sexuelles du traitement du cancer de la prostate de même que celles qui portent sur le traitement de ces effets secondaires sont fondées sur des preuves de niveau II.

PRINCIPAL MESSAGE Le diagnostic de cancer de la prostate peut à lui seul provoquer une dysfonction érectile. Toutes les formes de traitement de ce cancer peuvent entraîner des problèmes sexuels sérieux. Les traitements de cette dysfonction érectile ont alors des taux de réussite variables. On a démontré que la prostatectomie entraîne une dysfonction érectile dans 30% à 98% des cas, selon qu'il y a eu lésion d'un seul, des deux ou d'aucun des faisceaux nerveux. Le traitement par irradiation entraîne une dysfonction érectile dans plus de 70% des cas; c'est la curiethérapie qui cause le moins de déficiences sexuelles. Le traitement anti-androgénique a des conséquences importantes: plus de 80% des sujets accusent une perte d'érection un an après le traitement, en plus d'une grave diminution de la libido.

CONCLUSION C'est le médecin de famille qui est le mieux placé pour informer le patient atteint d'un cancer de la prostate des conséquences sexuelles éventuelles de ce cancer et des traitements associés. Il peut aussi aider le patient et sa partenaire à traiter les effets secondaires d'ordre sexuel.

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Prostate cancer is the most frequently diagnosed cancer (excluding nonmelanoma skin cancer) in Canadian men. In 2003, an estimated 18 800 men in Canada¹ were diagnosed with this disease; most of them will survive to live productive lives.

One of the consequences of prostate cancer treatment is the sexual dysfunction that frequently affects quality of life for these men and their partners. This paper describes the sexual consequences of prostate cancer and its treatments (prostatectomy, external beam radiation, brachytherapy, androgen deprivation therapy) that family physicians will see as they provide care to men with prostate cancer. This paper also suggests treatments for sexual side effects.

Quality of evidence

Articles in the literature describe the causes of sexual dysfunction following diagnosis of prostate cancer and the various treatments offered to men. English-language journals indexed in MEDLINE and PubMed were searched for relevant articles using the MeSH headings prostate cancer, prostatectomy, radiation therapy, brachytherapy, sexuality, and erectile dysfunction (ED). References in several articles were reviewed for potentially relevant articles not identified through database searches. Articles cited include review articles and randomized trials (13% of all studies), prospective and

retrospective cohort or case-control studies, observational studies, and case series (86% of all studies).

Effect of cancer diagnosis on sexual functioning

Erectile functioning declines with age, and many men experience erections that are less firm, last a shorter time, are less frequent, or require greater physical stimulation beginning in their 40s.² A diagnosis of prostate cancer can have serious emotional effects. Before treatment is even started, some men experience sexual dysfunction related to the diagnosis itself. In one study, 20% of men noted decreased sexual activity after the diagnosis, 15% noted decreased interest in sexual activity, 12% noted decreased pleasure, and 10% experienced erectile difficulty (level II evidence).³

Some men experience ejaculatory dysfunction after surgery or radiation therapy. The lack of fluid leads to what is referred to as “dry ejaculation.” While the other sensations of orgasm might be present, the lack of ejaculatory fluid can alter the sensation in the penis itself, and this sometimes causes distress. Guidance in anticipating this phenomenon can alleviate some of this distress.

Erectile dysfunction has far-reaching effects that extend beyond the bedroom and into everyday life. For many men, the ability to perform sexually is closely linked with masculinity. Any threat to sexual potency can affect more global aspects of quality of life, including self-confidence and self-esteem (level II evidence).^{4,5}

Some men choose treatment based on its side effect profile. In a survey of 262 men, 24.8% chose treatment based on possible side effects, and ED was named as an important consideration for those choosing brachytherapy or radical prostatectomy (level II evidence).⁶

Erectile dysfunction after prostatectomy

Incidence of ED following prostatectomy varies. Schover et al⁷ suggest that only 20% of men will have erections sufficient for penetration after

Levels of evidence

Level I: At least one properly conducted randomized controlled trial, systematic review, or meta-analysis

Level II: Other comparison trials, non-randomized, cohort, case-control, or epidemiologic studies, and preferably more than one study

Level III: Expert opinion or consensus statements

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prostatectomy (level II evidence). An important variable to consider is the type of surgery: non-nerve-sparing prostatectomy causes the greatest amount of ED and bilateral nerve-sparing surgery the least. Stanford et al⁸ found that 59.9% of men had ED 18 months after surgery. Prevalence decreased according to type of surgery (non-nerve-sparing prostatectomy 65.6%, unilateral nerve-sparing prostatectomy 58.6%, and bilateral nerve-sparing prostatectomy 56%) (level II evidence). Better sexual health outcomes were found to be related to younger age, nerve-sparing technique, smaller prostate size, and higher educational and income level. Other researchers found that erectile functioning improved as time passed, with progress seen more than 1 year after surgery (level II evidence).⁹

Erectile dysfunction after radiation therapy

Initially, there are few sexual side effects for men who choose radiation therapy, but erectile functioning declines starting at 12 months and levels off at 24 months. Turner et al¹⁰ found that 36% of men whose erectile function was adequate before treatment had ED at 12 months, and this percentage increased to 59% at 24 months (level II evidence).

Radiation therapy often causes bladder and bowel problems, which can also affect sexual functioning. Men with bowel dysfunction report decreases in sexual intimacy, marital affection, and masculine self-esteem (level II evidence).¹¹ In another study,¹² 10% of men reported urinary incontinence associated with arousal and attempted intercourse (level II evidence).

Brachytherapy, the implantation of radioactive seeds into the prostate, is believed to limit damage to adjacent tissues while maximizing radiation to the prostate gland itself. While the mechanism of brachytherapy-induced ED is not well understood, it is likely that a variety of factors affects potency including damage to nerves and blood supply, trauma to tissues, and psychogenic components.¹³ In a review of studies of potency following brachytherapy, Merrick and colleagues¹⁴ (level I evidence) cite potency of 94% at 2 years.^{15,16} Factors affecting potency include premorbid erectile function, age, supplemental external beam radiation, or androgen ablation therapy.¹⁷

A meta-analysis of 54 studies where the pretreatment functioning of subjects was known suggests that maintenance of erectile function varies widely (level I evidence) (Table 1).¹⁸

Erectile dysfunction related to androgen deprivation therapy

Androgen deprivation therapy is often suggested for elderly men for whom surgery poses an additional risk, as a way to shrink the tumour before radiation therapy, or for men who do not respond to other forms of treatment. The sexual consequences are global: loss of interest in sex as well as ED. Men report substantial problems with altered body image and self-concept, which often has a direct and devastating effect on intimate relationships and social functioning (level II evidence).^{19,20} Most often, men report a global loss of masculinity that affects family, social, and work relationships (level II evidence).²¹

Table 1. Probability of erectile function

TREATMENT	PROBABILITY OF ERECTILE FUNCTIONING AFTER 1 YEAR		PROBABILITY OF ERECTILE FUNCTIONING AFTER 2 OR MORE YEARS	
		95% CONFIDENCE LIMITS		95% CONFIDENCE LIMITS
Brachytherapy	0.76	0.69-0.82	No studies	
Brachytherapy plus external beam radiation	0.60	0.48-0.73	0.60	0.48-0.73
External beam radiation	0.55	0.52-0.58	0.52	0.48-0.56
Nerve-sparing prostatectomy	0.34	0.30-0.38	0.25	0.18-0.33
Non-nerve-sparing prostatectomy	0.25	0.23-0.26	0.25	0.23-0.26

Adapted from Robinson et al.¹⁸

Among men with some sexual interest at baseline, 54% reported no interest at 1 year. Among men with erections at baseline, 80% had ED after 1 year (level II evidence).²² Reduced energy and concern with urinary symptoms also affect sexual function (level II evidence).²³ In another study, 91% of men were found to have ED after androgen deprivation therapy (level II evidence).²⁴

Treatment of surgery-related ED

Despite the somewhat dismal projections for erectile function following prostatectomy, several treatments for ED have had some success among men with prostate cancer. Schover and colleagues²⁵ found that 38% of men reported that pharmaceutical treatment of ED was somewhat helpful and that those who tried more than one type of treatment were more likely to eventually have success (level II evidence).

Prevention of fibrosis is the first step. Experts suggest that men should attempt to return to sexual functioning within 2 months of surgery (level III evidence).²⁶ Regular use of either oral or intracorporeal treatment is believed to have an important psychological function in that visible proof of penile tumescence will prevent a dysfunctional sexual dynamic in couples. This dynamic often occurs when intercourse is impossible after surgery, and a pattern of avoidance begins, with the man withdrawing sexually and his partner reluctant to discuss the issue for fear of upsetting him further. He interprets this as lack of interest, which exacerbates his feelings of inadequacy, and the couple settle into a non-sexual relationship (level III evidence).²⁷

Sildenafil is somewhat useful for treating surgery-related ED; however, age and type of surgery (nerve-sparing vs non-nerve-sparing) are important. Zagaja et al²⁸ reported an overall positive response rate to sildenafil of 29%, yet men younger than 55 years who had bilateral nerve-sparing surgery had an 80% success rate compared with only 33% of men older than 66 years who had bilateral nerve-sparing surgery. Men in all age groups who had non-nerve-sparing surgery had no response

(level II evidence).²⁷ Similar results were found in a California study (level II evidence).²⁹ Three years after beginning therapy with sildenafil, 71% of the sample was still responding to the drug (level II evidence).³⁰

Another study of 21 men found that 71% of those participating had a positive response to sildenafil at approximately 24 months after surgery. Most of these men (81%) had no erectile problems before their surgery; however, 80% of the sample could achieve an erection only with the 100-mg dose (level II evidence).³¹ Positive results have been reported with the newer phosphodiesterase inhibitors; vardenafil was shown to be effective in promoting erections among 71.1% of men taking 20 mg and 59.7% of men taking 10 mg of the drug after bilateral nerve-sparing prostatectomy (level I evidence).³² Tadalafil differs from sildenafil and vardenafil chemically but works similarly; however, it has a longer half-life than the other two and can be taken with food.

These oral agents might not be tolerated by patients, and there are reports in the literature of serious side effects. The primary concern with these drugs relates to cardiovascular events, most commonly hypotension. A contraindication to use of these drugs is the use of nitrates.³³ Other side effects include headache, flushing, dyspepsia, rhinitis, nausea, visual disturbance, and back pain (level I evidence).³⁴

Other erectile aids have been shown to be effective in surgery-related ED. In one study, the 32% of participants who used erectile aids (vacuum devices, intracorporeal injections of alprostadil, or penile implants) were satisfied with the modality chosen (level II evidence).³⁵ Vacuum devices can cause bruising and trauma to the penis, however, and partners have complained that the penis feels cold. Use of intraurethral alprostadil also causes pain for about half the men who use this therapy. Surgical implants are highly effective but are expensive and invasive.³⁶ A small prospective study has shown intracorporeal injection of alprostadil, starting at 1 month after surgery and given three times a week, to increase the recovery rate of spontaneous erections (level II evidence).³⁷

Treatment of ED related to radiation therapy

Lack of erectile activity after therapy might cause chronic hypoxia in the corporal smooth muscle of the penis with a subsequent loss of elasticity and distensibility, which could lead to venous leak.³⁸ This fibrosis is also believed to cause penile shortening, observed in 68% of men after surgery (level II evidence).³⁹ Using oral therapy, such as sildenafil, to promote erections, with or without sexual activity, on a regular basis is suggested to preserve or improve erectile functioning (level III evidence).⁴⁰ Fifty-five percent of men taking sildenafil 39 months after treatment with external beam radiation were able to have sexual intercourse (level I evidence).⁴⁰

Sexuality counseling

Sexuality is a complex phenomenon that encompasses identity, body image, intimate relationships, sexual activity, and communication. All these come into play as men confront sexual problems related to the cancer itself and the treatments they have had. Many men regard ED as “their” problem and attempt to solve it alone with the use of medication or an erectile aid. The reality is that intercourse is a couples issue, and successful treatment requires the input and cooperation of the man’s sexual partner. Some women in this age group have their own sexual problems related to menopause and could in fact welcome the cessation of coital activities caused by ED.⁷

For those couples who are not interested in pharmacologic or mechanical solutions, couples counseling with an emphasis on communication skills, bibliotherapy, and sensate focus exercises is helpful in teaching alternatives to coital activity and helping to maintain intimacy in the face of sexual problems that are not amenable to treatment. The full range of counseling interventions is beyond the scope of this paper; however, Schover’s book can help physicians and patients.⁴¹ Referral to a sex therapist or support group can be beneficial as an adjunct to pharmacotherapy or when alternative coping skills are needed.


EDITOR’S KEY POINTS

- The diagnosis of prostate cancer alone causes some loss in sexual interest and function. Prostatectomy causes loss of erectile function in 30% to 98% of men, depending on their age, their previous functioning, and the degree of nerve sparing in the operation.
- External radiation causes erectile dysfunction in about 50% of men, while associated brachytherapy affects about 25%. Hormonal therapy affects both interest and functioning in 80% to 90% of men.
- Treatment leads to some improvement in 30% to 50% of men. Oral agents improve erectile dysfunction, depending on the type of treatment. Early treatment with these agents has led to a greater success rate, with reduced fibrosis. Mechanical devices have a mixed success rate.
- Family doctors can help their patients undergoing treatment for prostate cancer with anticipatory and ongoing counseling as well as by facilitating treatment.

POINTS DE REPÈRE DU RÉDACTEUR

- Le simple diagnostic de cancer de la prostate peut entraîner une baisse d’intérêt et d’activité sexuels. La prostatectomie entraîne une diminution de l’activité érectile chez 30% à 98% des hommes selon leur âge, leur niveau d’activité antérieur et l’importance des atteintes nerveuses durant l’opération.
- L’irradiation externe entraîne une dysfonction érectile dans environ 50% des cas tandis que la curiethérapie affecte environ 25% des sujets. L’hormonothérapie réduit l’intérêt ainsi que l’activité chez 80% à 90% des sujets.
- Le traitement amène une certaine amélioration chez 30% à 50% des hommes. Les agents oraux peuvent améliorer la dysfonction érectile selon le type de traitement. Leur utilisation précoce s’accompagne d’un meilleur taux de succès, avec moins de fibrose. Les appareils mécaniques ont un taux de succès mitigé.
- Le médecin de famille peut aider le patient traité pour le cancer de la prostate par des conseils avant et pendant le traitement et en facilitant le traitement.

Conclusion

Family physicians provide care to men with prostate cancer and their partners in all phases of the disease and should be able to anticipate adverse affects of the disease and treatments. Knowledge of the various treatments for ED is important to ongoing care of this population. 

Competing interests

None declared

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