

SEXUAL MEDICINE REVIEWS

Sexuality Following Radical Prostatectomy: Is Restoration of Erectile Function Enough?

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ABSTRACT

Introduction: Radical prostatectomies can result in urinary incontinence and sexual dysfunction. Traditionally, these issues have been studied separately, and the sexual problem that has received the most focus has been erectile dysfunction.

Aim: To summarize the literature on sexually related side effects and their consequences after radical prostatectomy and focus on the occurrence and management of problems beyond erectile dysfunction.

Methods: The literature on sexuality after radical prostatectomy was reviewed through a Medline search. Original research using quantitative and qualitative methodologies was considered. Priority was given to studies exploring aspects of sexuality other than erectile function.

Main Outcome Measures: The prevalence, predictive factors, and management of post-prostatectomy sexual problems beyond erectile dysfunction.

Results: Most patients will develop urinary incontinence in relation to sexual activity after surgery. This can present at the time of orgasm (ie, climacturia) or arise during arousal. In general, the problem subsides with time and pelvic floor training and tension penile loops can be used as treatments. Orgasmic disturbances after radical prostatectomy include altered perception of orgasm, anorgasmia, and orgasm-associated pain. The prevalence rates of these problems vary widely among studies but usually decrease with time. Phosphodiesterase type 5 inhibitors can increase orgasmic sensation and α -blockers can alleviate pain. Penile shortening and de novo deformity have been described; more research on their clinical impact is needed. When evaluating any of the problems mentioned, psychological factors should be considered and the patient's partner should be involved whenever possible.

Conclusion: Radical prostatectomies can cause a wide range of sexual problems. Therefore, restoration of erectile function alone is not enough. On the contrary, it is crucial that clinicians focus on patients' full sexual rehabilitation.

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Key Words: Climacturia; Erectile Dysfunction; Orgasmic Dysfunction; Prostate Cancer; Radical Prostatectomy; Sexuality

INTRODUCTION

Prostate cancer is the most common non-skin cancer in developed countries, with an estimated global incidence of 1.1 million cases in 2012 and an increasing incidence.¹ Radical

prostatectomy is considered standard treatment with curative potential for localized disease.² However, through disruption of local nerves, blood vessels, and muscular tissue, the surgery can result in functional problems—most notably, urinary incontinence and sexual dysfunction. Traditionally, these issues have been studied separately, and the sexual problem that has received the most focus has been erectile dysfunction (ED).^{3,4} In this context, “penile-rehabilitation” programs have been developed to improve postoperative erections in men who have undergone surgery with sparing of the cavernous nerves, and several treatments are available when spontaneous erections cannot be restored.⁵ However, in recent years, there has been an increased focus on previously neglected sexual side effects, including urinary incontinence in relation to sexual activity, orgasmic disturbances, and penile shortening and deformity.⁶ In addition,

Received May 4, 2016. Accepted July 9, 2016.

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<http://dx.doi.org/10.1016/j.sxmr.2016.07.005>

the importance of psychological issues and partner considerations are gaining recognition as factors in sexuality after radical prostatectomy. Furthermore, available data on sexuality after prostate cancer are targeted to heterosexual men and the concerns and needs of homosexual men are often neglected.

AIMS

The aim of this review is to summarize the literature on sexually related side effects and their consequences after radical prostatectomy. This review focuses focus on the prevalence, predictive factors, and management of problems beyond ED. A comprehensive review of the psychological aspects of sexual dysfunction after prostatectomy is beyond the scope of this review, but the topic is briefly discussed with a mention of special issues in homosexual men.

METHODS

The literature on sexuality after radical prostatectomy was reviewed through a Medline search using combinations of the terms *prostate cancer*, *radical prostatectomy*, *sexuality*, *sexual dysfunction*, *anorgasmia*, *climacturia*, *dysorgasmia*, *erectile dysfunction*, *incontinence*, *orgasm*, and *orgasmic dysfunction*. We restricted our search to articles published in English from January 1980 through April 2016. Original research using quantitative and qualitative methodologies was considered. Priority was given to studies exploring aspects of sexuality other than only erectile function. Articles were screened based on titles and abstracts. The final selection was made after reading the full texts. Reference lists from the selected articles were searched manually for additional relevant references. In addition to the references located through this search, we included brief descriptions of ED, penile rehabilitation, and psychological aspects.

ERECTILE DYSFUNCTION AND “PENILE REHABILITATION”

The cavernous nerves are responsible for inducing erections through the production of the vasoactive neurotransmitter nitric oxide and they course in close proximity to the prostate gland.⁷ Therefore, the rate of postoperative ED is close to 100% after traditional non—nerve-sparing radical prostatectomies. To ameliorate this problem, nerve-sparing procedures have been developed and have improved since the early 1980s.⁸ There is no doubt that this has been a great improvement and such procedures are performed whenever tumor characteristics allow for it. However, even with nerve-sparing and advanced techniques such as robot-assisted surgery, the rate of undisturbed erectile function is only in the range of 20% to 25% and has not improved in the past 17 years.⁹ Recent research has documented that the distribution of cavernous nerve fibers is far more varied and complex than found in previous studies, and incomplete nerve sparing is likely a significant contributor to ED.¹⁰ There

also can be additional trauma to the nerves during surgery through stretching, heating, and local ischemia and inflammation.¹¹ This is believed to cause a temporary block of nerve transmission even in anatomically intact fibers. In some men, the nerves can regain their function, which is illustrated by the fact that erectile function can improve up to 4 years after surgery.¹² However, erections are completely abolished during neurapraxia, and because oxygen tension is only 25 to 43 mm Hg in the flaccid penis and increases to approximately 100 mm Hg in the erect state, this can lead to penile hypoxia.¹³ The consequence is believed to be permanent alterations in the penile tissue, in which decreased elasticity and increased stiffness from fibrosis could disrupt the veno-occlusive mechanism and contribute to the development of permanent ED.¹⁴ This theory is substantiated by several animal studies and one human study in which smooth muscle apoptosis and fibrosis were found at histologic examination of penile tissue after induced cavernous nerve damage and radical prostatectomy, respectively.^{15–18}

Based on this idea, it has been theorized that long-term erectile function can be improved by traditional ED treatments during neurapraxia. This concept is termed *penile rehabilitation* and was first introduced in 1997 in a pilot study comparing three weekly alprostadil injections with observation in 30 men after nerve-sparing radical prostatectomies.¹⁹ In that study, 67% of men in the treatment group vs 20% in the observation group reported a return of spontaneous erections. Subsequently, three randomized placebo-controlled trials investigated the effects of phosphodiesterase type 5 inhibitors (PDE5Is) on penile rehabilitation. The first of these included 76 men and nightly sildenafil or placebo medication was administered for 9 months after nerve-sparing surgery.²⁰ After washout, 27% of men treated with sildenafil reported good erectile function, whereas only 4% in the placebo group did so. In the second larger study, 423 patients received vardenafil 10 mg nightly plus on-demand placebo, flexible-dose on-demand vardenafil plus nightly placebo, or nightly placebo plus on-demand placebo for 9 months.²¹ After washout, no statistically significant differences in ED rates were found among the three groups. Another assessment was performed after a subsequent 2-month period with open-label on-demand vardenafil treatment but there were still no differences among groups. The third study (N = 423) used an almost identical design to investigate the effects of tadalafil and showed no significant effect of active PDE5I treatment on erectile function.²² In addition, two randomized trials tested vacuum erection devices and one randomized trial tested penile vibratory stimulation in humans.^{23–25} None of these trials showed significantly better erectile function with treatment compared with observation. No other treatments have been tested in randomized trials.

Although the results of penile rehabilitation have generally been unconvincing for re-establishing spontaneous erections, these studies showed that injection therapy, PDE5Is, and vacuum devices can be effective in inducing assisted erections

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