



PRESERVING ERECTILE FUNCTION AFTER ROBOT ASSISTED RADICAL PROSTATECTOMY

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ABSTRACT

Radical prostatectomy (RP) is a commonly performed procedure for the treatment of localized prostate cancer. However, a large proportion of men still suffer from erectile dysfunction (ED) as a complication of RP, despite the advances in the surgical techniques and technological refinements. Therefore, there is an increasing interest in the treatment of post-RP ED problem, which is also known as "penile rehabilitation". Current treatment regimens rely on phosphodiesterase 5 inhibitors as the first-line therapy, with vacuum erection devices and intracavernosal injections of alprostadil as possible alternative options. These treatments prevent penile fibrosis after RP and increase oxygenation of the penile tissue. Future studies are warranted to elucidate the actual mechanisms which cause post-RP ED, and to establish the optimal penile rehabilitation program.

Key Words: Radical prostatectomy, Prostate cancer, Erectile dysfunction, Penile rehabilitation, Phosphodiesterase 5 inhibitors

Prostate cancer (PCa) is the most common solid malignancy and the second cause of cancer death among men (1). Radical prostatectomy (RP) is the most commonly applied curative procedure with low and intermediate - risk localized PCa in patients with a life expectancy longer than 10 years (2). The traditional surgical approach is open surgery in such cases; however, laparoscopic and robot-assisted techniques have been developed over the past 20 years (3). Functional outcomes after RP have been improved with the advancement of surgical techniques and development of different procedural modifications (4). However, erectile dysfunction (ED) remains to be a common complication associated with RP, which is one of the major concerns related to the surgery for both the PCa patients and the surgeons. Several studies demonstrated that preservation of the accessory pudendal arteries (APA) might improve erectile function (EF) recovery after RP (5). Additionally,

precise sparing of the neurovascular bundle (NVB) has been demonstrated to be associated with better EF outcomes following RP(6).

The introduction of the robotic surgery into the field of urology has provided such advantages to include: tridimensional binocular magnification, raising of motion and tremor filtration. It has been suggested that these advantages may improve the preservation of the NVB and APA, therefore providing better functional outcomes (7). Several authors reported EF recovery after robot-assisted RP (RARP) ranging between 40% and 90% at 12 months, postoperatively (8-11). The fibrotic changes in the penis following RP (12) and cavernosal nerve damage which commonly occurs during RP (13, 14) are proposed mechanisms for the development of ED after RP. Although modified nerve-sparing technique has been introduced (15) and cautery-free NVB preservation technique has been described for RARP (16), there are not enough

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evidence-based data to show the RARP is better outcome for EF and continuous efforts are made to improve the post-RARP EF outcomes, known as penile rehabilitation.

Montorsi et al. (17) performed the first attempt at penile rehabilitation in 1997. The authors randomized PCa patients after nerve-sparing RP and the treatment group (n=15) received intracavernous injections of alprostadil three times per week for 12 weeks. The more favourable EF outcomes in the treatment group introduced the idea that facilitating cavernous oxygenation via ED medications may preserve the erectile mechanisms in patients after RP. In the upcoming years pharmacological therapies such as sildenafil (18), vardenafil (19), tadalafil (20, 21) and avanafil (22) are assessed for their effectiveness in the treatment of post-RP ED. Vacuum erection devices are also recommended to be used following RP (23, 24); however, there are no data to support its role as monotherapy. Unfortunately, there is no consensus to define what represents the optimal rehabilitation program in regard to strategies utilized, timing of intervention, or duration of treatment (25). Better documentation and/or better methods of penile rehabilitation are necessary to adhere to the principles of evidence-based medicine.

In conclusion, recovery of EF after RP is significantly influenced by surgical method, surgeon's experience, patient age, baseline EF, nerve-sparing extension, techniques, and penile rehabilitation. Future studies are warranted to elucidate the actual mechanisms, which cause post-RP ED, and to establish the optimal penile rehabilitation program.

TAKE HOME MESSAGE

Several preclinical and translational studies have shown benefits of therapies including phosphodiesterase 5 inhibitor, intracavernosal injections of alprostadil and vacuum devices for the management of erectile dysfunction after radical prostatectomy. Future studies are warranted to elucidate the actual mechanisms, which cause this complication and to establish the optimal penile rehabilitation program.

REFERENCES

1. Siegel R, Naishadham D, Jemal A. Cancer statistics, 2013. *CA: a cancer journal for clinicians*. 2013;63(1):11-30.
2. Bill-Axelsson A, Holmberg L, Ruutu M, Haggman M, Andersson SO, Bratell S, et al. Radical prostatectomy versus watchful waiting in early prostate cancer. *The New England journal of medicine*. 2005;352(19):1977-84.
3. Moran PS, O'Neill M, Teljeur C, Flattery M, Murphy LA, Smyth G, et al. Robot-assisted radical prostatectomy compared with open and laparoscopic approaches: a systematic review and meta-analysis. *International journal of urology : official journal of the Japanese Urological Association*. 2013;20(3):312-21.
4. Alemozaffar M, Regan MM, Cooperberg MR, Wei JT, Michalski JM, Sandler HM, et al. Prediction of erectile function following treatment for prostate cancer. *Jama*. 2011;306(11):1205-14.
5. Rogers CG, Trock BP, Walsh PC. Preservation of accessory pudendal arteries during radical retropubic prostatectomy: surgical technique and results. *Urology*. 2004;64(1):148-51.
6. Walsh PC, Donker PJ. Impotence following radical prostatectomy: insight into etiology and prevention. *The Journal of urology*. 1982;128(3):492-7.
7. Kaul S, Bhandari A, Hemal A, Saveri A, Shrivastava A, Menon M. Robotic radical prostatectomy with preservation of the prostatic fascia: a feasibility study. *Urology*. 2005;66(6):1261-5.
8. Labanaris AP, Zugor V, Witt JH. Robotic-assisted radical prostatectomy in men ≤ 50 years of age. Surgical, oncological and functional outcomes. *Anticancer research*. 2012;32(5):2097-101.
9. Shikanov S, Desai V, Razmaria A, Zagaja GP, Shalhav AL. Robotic radical prostatectomy for elderly patients: probability of achieving continence and potency 1 year after surgery. *The Journal of urology*. 2010;183(5):1803-7.
10. Patel VR, Sivaraman A, Coelho RF, Chauhan S, Palmer KJ, Orvieto MA, et al. Pentafecta: a new concept for reporting outcomes of robot-assisted laparoscopic radical prostatectomy. *European urology*. 2011;59(5):702-7.
11. Asimakopoulos AD, Pereira Fraga CT, Annino F, Pasqualetti P, Calado AA, Mugnier C. Randomized comparison between laparoscopic and robot-assisted nerve-sparing radical prostatectomy. *The journal of sexual medicine*. 2011;8(5):1503-12.
12. Park DL, Aron M, Rewcastle JC, Boyd SD, Gill IS. A model for managing erectile dysfunction following prostate cancer treatment. *Current opinion in urology*. 2013;23(2):129-34.
13. Montorsi F, Briganti A, Salonia A, Rigatti P, Burnett AL. Current and future strategies for preventing and managing erectile dysfunction following radical prostatectomy. *European urology*. 2004;45(2):123-33.
14. Moskovic DJ, Miles BJ, Lipshultz LI, Khera M. Emerging concepts in erectile preservation following radical prostatectomy: a guide for clinicians. *International journal of impotence research*. 2011;23(5):181-92.
15. Burnett AL, Aus G, Canby-Hagino ED, Cookson MS, D'Amico AV, Dmochowski RR, et al. Erectile function outcome reporting after clinically localized prostate cancer treatment. *The Journal of urology*. 2007;178(2):597-601.
16. Chien GW, Mikhail AA, Orvieto MA, Zagaja GP, Sokoloff MH, Brendler CB, et al. Modified clipless antegrade nerve preservation in robotic-assisted laparoscopic radical prostatectomy with validated sexual function evaluation. *Urology*. 2005;66(2):419-23.

17. Montorsi F, Guazzoni G, Strambi LF, Da Pozzo LF, Nava L, Barbieri L, et al. Recovery of spontaneous erectile function after nerve-sparing radical retropubic prostatectomy with and without early intracavernous injections of alprostadil: results of a prospective, randomized trial. *The Journal of urology*. 1997;158(4):1408-10.
18. Schwartz EJ, Wong P, Graydon RJ. Sildenafil preserves intracorporeal smooth muscle after radical retropubic prostatectomy. *The Journal of urology*. 2004;171(2 Pt 1):771-4.
19. Montorsi F, Brock G, Lee J, Shapiro J, Van Poppel H, Graefen M, et al. Effect of nightly versus on-demand vardenafil on recovery of erectile function in men following bilateral nerve-sparing radical prostatectomy. *European urology*. 2008;54(4):924-31.
20. Aydogdu O, Gokce MI, Burgu B, Baltaci S, Yaman O. Tadalafil rehabilitation therapy preserves penile size after bilateral nerve sparing radical retropubic prostatectomy. *International braz j urol : official journal of the Brazilian Society of Urology*. 2011;37(3):336-44; discussion 44-6.
21. Montorsi F, Brock G, Stolzenburg JU, Mulhall J, Moncada I, Patel HR, et al. Effects of tadalafil treatment on erectile function recovery following bilateral nerve-sparing radical prostatectomy: a randomised placebo-controlled study (REACTT). *European urology*. 2014;65(3):587-96.
22. Mulhall JP, Burnett AL, Wang R, McVary KT, Moul JW, Bowden CH, et al. A phase 3, placebo controlled study of the safety and efficacy of avanafil for the treatment of erectile dysfunction after nerve sparing radical prostatectomy. *The Journal of urology*. 2013;189(6):2229-36.
23. Kohler TS, Pedro R, Hendlin K, Utz W, Ugarte R, Reddy P, et al. A pilot study on the early use of the vacuum erection device after radical retropubic prostatectomy. *BJU international*. 2007;100(4):858-62.
24. Raina R, Agarwal A, Ausmundson S, Lakin M, Nandipati KC, Montague DK, et al. Early use of vacuum constriction device following radical prostatectomy facilitates early sexual activity and potentially earlier return of erectile function. *International journal of impotence research*. 2006;18(1):77-81.
25. Mulhall JP, Bivalacqua TJ, Becher EF. Standard operating procedure for the preservation of erectile function outcomes after radical prostatectomy. *The journal of sexual medicine*. 2013;10(1):195-203.