Psychiatria Danubina, 2021; Vol. 33, Suppl. 4 (part IV), pp 1274-1277 *Conference paper*

Mini review

IMPROVEMENT OF QUALITY OF LIFE AFTER RADICAL PROSTATECTOMY

Helena Kolar Mitrović[1], Porin Perić[1], Tvrtko Hudolin[2], Mirko Bakula[2], Ilija Jurić[2] & Željko Kaštelan[2]

[1]*Department for Rheumatology and Rehabilitation, University Hospital Centre Zagreb, Zagreb, Croatia*
[2]*Department of Urology, University Hospital Centre Zagreb, Zagreb, Croatia*

SUMMARY

Prostate cancer screening has increased the number of patients eligible for radical prostatectomy (RP), but this curable surgery also increases the risk of postprostatectomy erectile dysfunction and urinary incontinence, and although these adverse effects may vary depending on their incidence, severity and duration they are present in most men who undergoing RP, exposing them to psychosocial problems, increasing health care costs and reducing labour productivity, therefor it is of great importance to reduce or even prevent them. Pelvic physical rehabilitation is a relatively simple, non-invasive, outpatient method that, if applied properly before and/or after RP, can significantly reduce adverse effects, increase patient quality of life and satisfaction with surgery, but also reduce health care costs and accelerate return to work. It is therefore important that our patients and physicians are aware of the benefits of a pelvic muscle training program.

Key words: *radical prostatectomy - quality of life - urinary incontinence - erectile dysfunction - pelvic rehabilitation - pelvic floor muscle training*

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INTRODUCTION

In addition to oncological results, radical prostatectomy (RP) has functional ones which can significantly reduce patient's satisfaction with surgery and affect their health and quality of life (QoL). Eastham introduced the notion of trifecta i.e. cancer-free, continent and potent, as the ultimate goal of RP, however this can be challenging to achieve (Eastham et al. 2008). Numerous factors are responsible for the trifecta, from prostate cancer itself, the patient's age and condition in general, to surgical ones, related to the surgeon's experience, surgical approach and techniques used (Holze et al. 2022). Because RP is not only indicated for local disease, but can reduce disease burden, even in patients with advanced cancer, an increase in the number of RPs is expected in the future, and thus the number of patients exposed to these adverse effects (Mandel et al. 2017).

Neurovascular bundles (NVB) are complexes of nerve fibers and blood vessels that are considered one of the most important structures for the functional outcomes of RP, and although they were described almost 40 years ago with numerous published papers on how to preserve them, we are still unsure and cannot predict whether our patients will have a satisfactory functional outcome even if we preserved them (Walsh et al. 2017). Furthermore, are they only anatomically preserved or are they still functional? Surgical manipulations required to separate the prostate from surrounding structures and tissues, as well as the use of the various techniques and energy sources to achieve this, can cause reversible and/or irreversible functional damage to these delicate structures leading to anatomical but not functional preservation. In addition to NVB, preservation of the bladder neck and urethral sphincter is crucial for better recovery of urinary continence after RP and requires meticulous surgical technique and detail knowledge of pelvic anatomy.

Pelvic floor muscle training

For continence and potence, complex mechanisms which are under the control of nerves, muscles, and blood vessels (vascular structures) at several levels from brain to spine, through peripheral nerves to bladder, prostate and penis are responsible. This complexity can be significantly impaired by several factors that may be present before RP, but it can also be adversely affected by surgery itself, so the question is can we better prepare our patients for RP to reduce side effects? Furthermore, is this preparation needed only before RP or should it be followed, i.e., should our patients continue activities after recovery of functions for their maintenance and for how long?

The basic principle of physical rehabilitation is simple and well known. After an injury, trauma or surgery, physical rehabilitation will help patients recover faster and better. Unfortunately, this well proven and widely used concept for many conditions and diseases has not been used to its potential or even at all for patients undergoing RP, as most of them do not receive pelvic floor muscle training (PFMT). Furthermore, the concept of muscle training is known to be the cornerstone of any improvement in the physical and mental well-being of the body, proving the crucial importance of this approach (Zhang et al. 2021).

PFMT has been used for decades to reduce urinary incontinence, mostly stressful, especially in women, because mastering voluntary contraction has been shown to increase urethral pressure, inhibit detrusor contractions, and prevent urine leakage (Newman et al. 2013). Can this approach be applied for prostate cancer (PCa) patients facing surgery or even radiotherapy? There are numerous papers with different approaches, study designs and complexity, addressing this issue, often with different, even conflicting results, and it is logical to ask, how different answers can be obtained to the relatively simple question of whether preoperative or postoperative PFMT improves potency and/or continence after RP (Franke et al. 2000, Wille et al. 2003, Parekh et al. 2003, Filocamo et al. 2005, Burgio et al. 2006, Anderson et al. 2015, Feng et al. 2022)? Beside the differences and potential biases related to the study design and patient selection/inclusion as well as the surgery, the answer is probably significantly influenced by PFMT itself. Are we teaching/training our patients the right or rather the optimal approach? Do we have a well-established training protocol? How do we achieve proper biofeedback? How do we monitor and improve training? How do we evaluate the results? Just to name a few of them, which we considered to be the most important.

DISCUSSION

When we ask all these questions, we can come up with a simple answer. Failure to identify pelvic floor muscles and/or exercise them properly is the most common cause of poor outcomes of this treatment modality. Furthermore, confirming that patients know what and how to do, is often overlooked (Newman et al. 2013). So, it is not any more the question should we do it, it is the question how to do it to achieve best outcome?

Although the optimal approach is not well established and is still meter of debate, the more committed we are to this program, the better results we will achieve. The correct approach would include patient adapted introductory lectures on pelvic anatomy and physiology as well as prostate cancer surgery and its consequences. This can help patients, but also their partners, to understand and become better acquainted with this topic. The next step is training under the guidance and control of a physiotherapist with proper biofeedback and regular follow-up to achieve the best results (Overgard et al. 2008, Van Kampen et al. 2000). Biofeedback enables the patient to immediately become aware of whether he is exercising properly or not, so that the necessary corrections can be made for optimal training. There are several possible modalities for monitoring biofeedback, from manometry originally developed and used by Kegel to electromyography or manometric pressure, which are most used today, often associated with sophisticated software and computers. Although there are several approaches related to location and type of sensors/ electrodes, skin surface electrodes are considered optimal, since they are well tolerated, non-invasive and provide good information on muscle activity.

It is important to teach patients to train their muscles properly, although exercise recommendations may vary depending on the number of repetitions per workout, the number of workouts per day, and the duration in weeks or months (Hall et al. 2018). In general, there are two types of muscle contractions that patients need to practice, short and long followed by relaxation. Short are those that last 2 seconds, i.e., they should be fast and intense, and long are those that last 3, 5 or 10 seconds. These exercises can be performed in a standing, sitting, or lying positions, anywhere and anytime (Newman et al. 2013). Once patients have learned how to do PFMT, they should continue training at home, with the help of additional materials such as DVDs or even web-based applications (Bo et al. 1999, Morkved et al. 1997, Morkved et al. 2000). It is also important to reassure patients that this training, if applied properly, has no negative side effects. Rehabilitation programs before RP represent a shift from traditional "reactive" postoperative rehabilitation to a "proactive" model that allows patients to be an active participant in the clinical treatment of their disease (Mungovan et al. 2021). Furthermore, this approach will have positive effects not only on PFMs but also on other body systems such as cardiovascular, respiratory, or neuropsychological, increasing overall wellbeing and reducing sickness (Angenete et al. 2016, Mina et al. 2014).

To properly assess the effect of PFMT, we need to know the patient's potency and continence status before RP and then re-evaluate them at different time points after RP, i.e., usually one, three, six and twelve months after surgery. Several questionnaires are used to properly assess sexual and urinary function. The International Index of Erectile Function (IIEF) for the assessment of male sexual function, developed and validated in the mid-1990s by an international panel of experts supported by Pfizer, is considered the most important, because it has been translated into many languages, used worldwide and adopted as „gold standard" (Rosen et al. 2002). The IIEF evaluates not only erection, but also orgasmic function, sexual desire, intercourse, and overall satisfaction, so its simplified and shorter version (IIEF-5 items (IIEF-5)) is often used to assess erectile function alone with the five questions, values from 1-5 and total scores (22-25: no erectile dysfunction, 17-21: mild erectile dysfunction, 12-16: mild to moderate erectile dysfunction, 8-11: moderate erectile dysfunction and 5-7: severe erectile dysfunction).

The International Consultation on Incontinence Questionnaire (ICIQ-UI SF) is used for evaluation of frequency, severity, and impact on the QoL of urinary incontinence (Karmakar et al. 2017). It is a simple and short questionnaire scored on a scale from 0-21 with the cut-off value of ≥ 6 (Avery et al. 2004, Machioka et al. 2019). The number of pads per day is also something that is widely used to assess postprostatectomy continence, defined using 0-1 pads per day. A pad weight test can also be used, although its use is limited due to technical problems and different variations in the way the test is performed (Krhut et al. 2014). The combination of these methods will result in a more objective assessment of urinary continence and better monitoring of its recovery after RP, compared to an individual approach, as suggested by some authors (Garcia Cortes et al. 2021).

Excellent long-term oncological outcomes after RP have shifted the focus to functional ones, however, urologists often do not offer any specific training for patients, especially before surgery. PFMT is non-invasive, inexpensive procedure without any significant side effects and although it requires additional efforts for implementation, after properly guided by a physiotherapist and learned by the patient, it can be performed at home and when everything is taken into count its use is more than justified.

We should do our best to help our patients in preventing, reducing, or even eliminating devastating consequences of RP. With well-established treatment options like minimally invasive surgical approaches and new radiation techniques, optimal physical therapy before and/or after RP will probably bring most significant improvement to patient QoL and their satisfaction with radical treatment of PCa.

CONCLUSION

Pelvic physical rehabilitation is a relatively simple, non-invasive, outpatient method that, if applied properly before and/or after RP, can significantly reduce adverse effects, increase patient quality of live and satisfaction with surgery, but also reduce health care costs and accelerate return to work. It is therefore important that our patients and physicians are aware of the benefits of a pelvic muscle training program.

Acknowledgements: None

Conflict of interest: None to declare.

Contribution of individual authors:

All the authors have taken part in the preparation and revisions of the paper; the final manuscript was approved by each author.

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Correspondence:
Helena Kolar Mitrović, MD
Department for Rheumatology and Rehabilitation, University Hospital Centre Zagreb
Kišpatićeva 12, 10 000 Zagreb, Croatia
E-mail: helemitrovic@gmail.com