

Pelvic Floor Rehabilitation for Urinary Incontinence after Radical Prostatectomy: Techniques and Recommendations

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Abstract

Original Research Article

Introduction: Urinary incontinence is a common complication following radical prostatectomy, significantly impacting patients' quality of life. This systematic review aimed to evaluate the efficacy of various pelvic floor rehabilitation techniques in managing post-prostatectomy urinary incontinence. **Methods:** A comprehensive literature search was conducted using PubMed and Google Scholar, yielding 34 relevant studies for analysis. **Results:** The review found that pelvic floor rehabilitation, encompassing techniques such as pelvic floor exercises, biofeedback, electrical stimulation, and behavioral management, offers a non-invasive and cost-effective approach to improving continence outcomes. While the optimal timing and duration of rehabilitation remain debated, evidence supports initiating pelvic floor muscle training preoperatively and continuing postoperatively. Combining multiple rehabilitation techniques, particularly manual therapy with biofeedback or functional electrostimulation, appears to yield the best results in accelerating continence recovery. Preoperative rehabilitation showed mixed outcomes, with some studies reporting improved continence and others finding no additional benefit. Postoperative rehabilitation strategies varied, but generally focused on gradually increasing pelvic floor strength and control. The long-term efficacy of rehabilitation at 12 months post-surgery was comparable to no intervention in some studies. **Conclusion:** While pelvic floor rehabilitation demonstrates modest effectiveness in managing post-prostatectomy urinary incontinence, particularly in the short term, further research is needed to establish optimal protocols and long-term benefits. These findings underscore the importance of a comprehensive, patient-centered approach to post-prostatectomy care.

Keywords: Urinary incontinence, pelvic floor rehabilitation, electrostimulation.

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INTRODUCTION

Radical prostatectomy is the standard treatment for localized prostate cancer, but it can lead to erectile dysfunction and urinary incontinence, significantly impacting quality of life. The definition of post-prostatectomy urinary incontinence varies across studies [1, 2], with an incidence ranging from 2% to 60% [3]. This incontinence can result from sphincter damage, bladder overactivity, compliance issues, or a combination of these factors [4]. Preoperative factors like advanced age, high BMI, existing lower urinary tract symptoms, short functional urethra length, and bladder

functional changes can negatively impact postoperative continence [5].

Surgical technique and surgeon experience are crucial for postoperative continence outcomes. Better results are seen with increased surgeon experience, higher annual prostatectomy volumes, and university center affiliation [6-8]. Factors such as extensive dissection, neurovascular bundle damage, and postoperative fibrosis negatively impact continence, while bladder neck preservation and anterior bladder-urethra anastomosis fixation improve it [5]. The benefit of posterior pelvic reconstruction remains debated [5].

Urinary incontinence risk is similar across surgical approaches, with varying rates:

Approach	Urinary Incontinence Rate
Retropubic radical prostatectomy	10-40% [9-11]
Perineal radical prostatectomy	4-35% [12, 13]
Laparoscopic radical prostatectomy	10-40% [9, 10, 14]
Robot-assisted laparoscopic prostatectomy	10-25% [11, 15]

Management of post-prostatectomy urinary incontinence includes patient education and perineal rehabilitation, which may start preoperatively to help patients control urination. Rehabilitation techniques include pelvic floor exercises, behavioral techniques, bladder training, biofeedback, and electrical stimulation, often combined for optimal effectiveness [16].

METHODS

A systematic review of the literature was conducted using PubMed and Google Scholar. The search terms included "post radical prostatectomy urinary incontinence," "pelvic floor rehabilitation," and "radical prostatectomy." The initial search identified about 900 articles, of which 34 were selected based on relevance, recency, and type. The chosen articles included original research, meta-analyses, guidelines, and reviews published in both French and English.

RESULTS AND DISCUSSION

Post-Prostatectomy Rehabilitation Methods:

The primary goal of rehabilitation is to prevent and minimize post-prostatectomy urinary incontinence. Various techniques include:

1. **Information:** Active and persistent patient participation is crucial. The physiotherapist plays a key role in motivating patients by explaining continence mechanisms and rehabilitation strategies, ideally before surgery [16].
2. **Pelvic Floor Exercises (PFE):** PFE requires initial learning and combines home exercises. Awareness of contraction and relaxation is enhanced by manual contact, as verbal instructions alone are often insufficient. Initial improvements are mostly neurological. Exercises focus on endurance, involving both fast (type II) and slow (type I) muscle fibers. Patients practice PFE daily in various positions and before activities likely to cause leaks [16].
3. **Biofeedback (BFB):** BFB uses visual, auditory, or tactile feedback from perineal muscle contractions to enhance learning. Sensors can be manometric or electromyographic, with intracavitary or surface applications. BFB helps in awareness, patient engagement, and learning [4, 17].
4. **Electrical Stimulation:** This method induces muscle responses via the pudendal nerve, enhancing proprioception, muscle strength, fatigue resistance, detrusor inhibition,

analgesia, relaxation, and maximum closure pressure. It uses biphasic current (5-70 Hz) and is contraindicated in cases of pacemakers, pregnancy, menstruation, and cancer [16].

5. **Extracorporeal Magnetic Stimulation (EMS):** EMS stimulates pelvic floor muscles and sacral roots using a magnetic field generator. The treatment is painless, with patients remaining clothed. Mixed results have been reported, and further studies are needed [18].
6. **Abdominal Competence and Muscle Co-activation Training:** Abdominal competence, involving the transverse abdominis muscle, is essential for continence during effort. Training techniques focus on abdominal and pelvic floor muscle co-contraction [19].
7. **Behavioral Management:** Lifestyle adjustments, such as fluid intake control, avoiding bladder irritants (coffee, tea, carbonated drinks, alcohol), and maintaining a balanced diet, can improve symptoms. Obesity management is crucial due to its association with increased pelvic floor strain and diabetes-related urgency. Addressing conditioned reflexes like "door syndrome" helps manage urgency [16].
8. **Bladder Training:** Encourages new voiding habits and gradually increases intervals between voids. Based on a voiding diary, it focuses on high-risk situations and reduces daytime voiding. Training is as effective as medication short-term and more effective long-term without side effects. It can begin post-catheter removal [20].

These methods aim to enhance urinary control and improve quality of life after prostatectomy.

Preoperative Rehabilitation

Several regimens are described in the literature. The start of preoperative rehabilitation varied among studies, beginning 2-4 weeks before surgery in most studies [21, 22, 23, 24, 25], 3 days before [22], 3 to 6 weeks before [26], and 1 day before surgery [27, 28]. Session durations ranged from 20 minutes to 1 hour, with frequencies varying from twice a week to once a week.

Some studies showed that preoperative rehabilitation improves continence after prostatectomy [27, 29-31], while others concluded that it offers no additional benefit [32]. The value of preoperative

rehabilitation remains controversial, but it has the advantage of establishing the patient-therapist relationship, initial perineal awareness, and performing a preoperative assessment.

Postoperative Rehabilitation

No study specifies the ideal time to start rehabilitation post-surgery. Some teams suggest resuming contractions on the catheter to minimize inactivity and sphincter insufficiency, but this has not been proven safe or beneficial. Most prefer not to stress the anastomosis area with sphincter contractions while the catheter is in place [16].

- **Early Phase:** Catheter removal typically occurs around the fifth day. Perineal locking and abdominoperineal protection techniques, learned preoperatively, are implemented early. A voiding diary can be started to encourage increasing the interval and volume of voids.
- **Return Home:** Exercises resume two to three weeks post-surgery, focusing on holding contractions. Intracavitary techniques restart after complete healing, around six weeks. SEF is used for proprioceptive effects, with surface electrodes often sufficient. Patients are advised to use incontinence protection only as needed and not let incontinence limit their activity.

Benefits of Different Rehabilitation Techniques:

- Manual therapy allows for faster continence recovery.
- Functional electrostimulation or biofeedback can improve manual therapy results.
- Preoperative rehabilitation does not improve long-term outcomes.
- There is no difference in continence at 12 months with or without rehabilitation.
- Biofeedback and electrostimulation alone have very modest effectiveness [33, 34].

Summary of Recommendations

- Pelvic floor rehabilitation is widely recommended both before and after prostatectomy. Key recommendations include initiating pelvic floor muscle training (PFMT) preoperatively and continuing it postoperatively to speed up recovery. Biofeedback (BFB) is also recommended postoperatively in combination with PFMT to improve outcomes. However, the benefit of electrostimulation is generally not supported by the recommendations.
- These guidelines highlight the importance of a comprehensive and continuous rehabilitation approach using various techniques to optimize urinary continence recovery after prostatectomy.

CONCLUSION

Urinary incontinence remains a significant challenge after radical prostatectomy, affecting patients' quality of life. Pelvic floor rehabilitation offers a cost-effective and non-invasive method to accelerate continence recovery and reduce incontinence episodes. Combining multiple rehabilitation techniques, such as PFMT, BFB, and FES, provides optimal outcomes. While the long-term benefits of preoperative rehabilitation are less certain, overall evidence supports the modest effectiveness of biofeedback and electrostimulation when used alongside manual exercises.

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