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Post-Prostatectomy Incontinence: Risk Factors, Rehabilitation and Surgical Options

Nietrzymanie moczu po prostatektomii: czynniki ryzyka, leczenie zachowawcze i chirurgiczne

Cyryl Rabcewicz, ORCID: 0009-0004-3452-9540[1], Mateusz Marcinek, ORCID: 0000-0002-5784-5245[1]

[1] Specialist Voivodeship Hospital of Saint Barbara No. 5 in Sosnowiec — Trauma Center Plac Medyków 1, 41-214 Sosnowiec, PL

Streszczenie

Wstęp: Nietrzymanie moczu po prostatektomii (PPI) to uciążliwe powikłanie dotykające mężczyzn po radykalnej prostatektomii, znacząco obniżające jakość życia. Pomimo postępów w technikach chirurgicznych, PPI pozostaje istotnym problemem w praktyce urologicznej.

Cel przeglądu: Celem niniejszego przeglądu jest kompleksowa analiza aktualnego stanu wiedzy na temat PPI, ze szczególnym uwzględnieniem czynników ryzyka, metod diagnostycznych, podejść rehabilitacyjnych i opcji chirurgicznych.
Metody: Przeprowadzono przegląd literatury z wykorzystaniem recenzowanych artykułów z bazy PubMed (2015–2024), autorytatywnych podręczników urologii i aktualnych wytycznych klinicznych. Priorytetowo traktowano badania kohortowe, przeglądy systematyczne i randomizowane badania kontrolowane.
Wyniki: PPI ma charakter wieloczynnikowy i zależy od czynników związanych z pacjentem (wiek, BMI, choroby współistniejące), charakterystyki guza oraz techniki operacyjnej. Wczesna rehabilitacja mięśni dna miednicy poprawia wyniki w zakresie trzymania moczu. Leczenie farmakologiczne ma ograniczoną skuteczność. Gdy leczenie zachowawcze zawodzi, opcje chirurgiczne — takie jak taśmy męskie i sztuczne zwieracze cewki moczowej — zapewniają trwałą ulgę, choć obarczone są różnym ryzykiem powikłań.

Wnioski: Skuteczne leczenie PPI wymaga podejścia multidyscyplinarnego, opartego na wczesnej diagnostyce, edukacji pacjenta i terapii dostosowanej indywidualnie. Nowe techniki regeneracyjne i neuromodulacyjne mogą w przyszłości stanowić alternatywę dla obecnych metod leczenia.

Słowa kluczowe: nietrzymanie moczu po prostatektomii, radykalna prostatektomia, nietrzymanie moczu, implant męski typu „sling", sztuczny zwieracz cewki moczowej, rehabilitacja mięśni dna miednicy

Abstract

Background: Post-prostatectomy incontinence (PPI). is a distressing complication affecting men following radical prostatectomy, significantly impairing quality of life. Despite advances in surgical techniques, PPI remains a prevalent concern in urologic practice.

Objective: This review aims to comprehensively examine the current understanding of PPI, focusing on its risk factors, diagnostic assessment, rehabilitative approaches, and surgical interventions. Methods: A literature review was conducted using peer-reviewed articles from PubMed (2015–2024), authoritative urology textbooks, and recent clinical guidelines. Priority was given to high-quality cohort studies, systematic reviews, and randomized controlled trials relevant to PPI. Results: PPI is multifactorial, influenced by patient-related factors (age, BMI, comorbidities), tumor-related characteristics, and surgical technique. Early pelvic floor rehabilitation has shown efficacy in improving continence outcomes. Pharmacologic treatments have limited success. When conservative measures fail, surgical options — including male slings and artificial urinary sphincters — offer durable relief, albeit with distinct complication profiles.

Conclusions: Managing PPI requires a multidisciplinary approach rooted in early diagnosis, patient education, and individualized therapy. Emerging regenerative and neuromodulatory techniques may offer future alternatives.

Key words: post-prostatectomy incontinence, radical prostatectomy, urinary incontinence, male sling, artificial urinary sphincter, pelvic floor rehabilitation

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✉ Cyryl Rabcewicz, E-mail: kiryl.rabtsevich@wp.pl — adres prywatny w dyspozycji Redakcji

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Wstęp

Radical prostatectomy is a cornerstone of curative therapy for localized prostate cancer, offering favorable oncologic outcomes in appropriately selected patients. However, one of its most common and distressing complications is post-prostatectomy incontinence (PPI), with reported rates ranging from 4% to 40% depending on the definition used, the surgical technique, and the timing of assessment [1, 2]. This complication significantly impacts health-related quality of life, causing physical discomfort, emotional distress, and social withdrawal [3].

PPI differs from other types of male urinary incontinence in both etiology and management. It primarily results from iatrogenic damage to the sphincteric mechanism during prostate removal, although additional contributing factors include detrusor overactivity, impaired compliance, and changes in bladder neck dynamics [4, 5]. Despite advancements in minimally invasive and robotic-assisted surgical approaches, PPI remains a challenge for both patients and clinicians. A comprehensive understanding of the pathophysiology and risk factors for PPI is essential to develop optimal prevention and management strategies. In addition, clinicians must be well-versed in both non-surgical and surgical treatment modalities to tailor therapy to individual patient needs and expectations [6, 7].

This review aims to synthesize the current evidence on PPI, focusing on identifiable risk factors, effective rehabilitative strategies, and available surgical treatments. By consolidating contemporary research and clinical guidelines, this paper seeks to provide a clear framework for the management of PPI in urologic practice.

Epidemiology and Burden

Post-prostatectomy incontinence (PPI) is one of the most common functional complications following radical prostatectomy (RP). Its incidence varies widely in the literature, reflecting differences in definitions, assessment methods, patient populations, and follow-up durations. Estimates suggest that between 5% and 20% of men continue to experience clinically significant urinary incontinence one year after surgery, despite nerve-sparing techniques and robotic approaches [1, 8]. Immediate postoperative incontinence is nearly universal due to disruption of the internal sphincter and external rhabdosphincter. However, most men gradually regain continence within the first 6 to 12 months. Persistent incontinence beyond this period — often defined as the need for one or more pads per day — is considered pathological [9].

The burden of PPI extends beyond physical symptoms. Patients report decreased self-esteem, impaired sexual relationships, social embarrassment, and increased risk of depression and anxiety [10, 11]. The economic burden is also substantial, encompassing the costs of incontinence supplies, medications, physiotherapy, surgical revisions, and lost productivity [12].

Age-related decline in pelvic floor and sphincter function, as well as comorbidities such as diabetes mellitus and obesity, further complicate continence recovery in many men [13]. Additionally, population studies have identified racial and socioeconomic disparities in the reporting and management of PPI, highlighting the need for equitable access to care and patient education [14].

As the number of prostate cancer survivors grows due to earlier detection and improved therapies, the public health importance of addressing PPI becomes increasingly significant. Clinicians must not only counsel patients preoperatively about this risk but also offer a proactive, stepwise management plan that supports long-term recovery and well-being.

Pathophysiology and Risk Factors

Post-prostatectomy incontinence (PPI) arises primarily from damage or dysfunction of the urinary continence mechanisms, particularly the external urethral sphincter and surrounding supportive structures. The male continence system relies on coordinated function of the internal (smooth muscle) and external (striated muscle) sphincters, pelvic floor musculature, and the neural pathways regulating detrusor activity [15].

* *Mechanisms of Incontinence*

Radical prostatectomy disrupts the anatomy and neurovascular integrity of the lower urinary tract. The internal sphincter, located at the bladder neck, is often partially or fully removed during surgery. The external rhabdosphincter, which wraps around the membranous urethra, may be injured through excessive dissection, cautery, or traction — particularly at the apex of the prostate where preservation is technically challenging [16, 17].

In addition to sphincteric weakness, detrusor overactivity is observed in up to 60% of men with PPI, possibly due to denervation, altered bladder compliance, or changes in detrusor-sphincter coordination [18]. Other contributors include loss of urethral support, impaired pubourethral ligament function, and reduced pelvic floor tone, especially in older patients [19].

* *Risk Factors for PPI*

A multitude of patient-, disease-, and surgery-related factors influence the likelihood of developing PPI:

- Age: Older age is consistently associated with higher risk, likely due to diminished muscle tone and neural plasticity [20]
- Body Mass Index (BMI): Obesity impairs pelvic floor dynamics and correlates with delayed continence recovery [21]
- Preoperative urinary function: Baseline lower urinary tract symptoms or detrusor overactivity may predispose to worse postoperative outcomes [22]
- Comorbidities: Diabetes mellitus, chronic pulmonary disease (due to increased intra-abdominal pressure), and neurologic disorders have been linked to prolonged incontinence [23]

Cyryl Rabcewicz, ORCID: 0009-0004-3452-9540, Mateusz Marcinek, ORCID: 0000-0002-5784-5245

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- Surgical factors: The extent of apical dissection, preservation of the neurovascular bundles, type of anastomosis, and surgeon experience all contribute significantly [24]
- Surgical approach: Robotic-assisted laparoscopic prostatectomy (RALP) may offer improved continence outcomes compared to open approaches, although this is not uniformly supported across studies [25, 26]

Understanding these factors is crucial not only for preoperative counseling and risk stratification but also for tailoring postoperative rehabilitation and timely intervention.

Diagnostic Evaluation

Accurate diagnosis and characterization of post-prostatectomy incontinence (PPI) are essential to guide treatment. A systematic approach incorporating patient history, validated questionnaires, physical examination, and diagnostic testing enables clinicians to determine the severity, type, and underlying mechanism of incontinence.

* Clinical History and Symptom Assessment

The clinical evaluation begins with a thorough history that includes the onset, duration, frequency, and pattern of leakage. Important distinctions include stress incontinence (leakage with physical exertion), urgency incontinence (leakage associated with a sudden urge to void), and mixed incontinence [27].

Patients should be asked about pad usage, quality-of-life impact, voiding frequency, nocturia, and previous treatments. It is also essential to review surgical details (e.g., date, technique, nerve-sparing status), comorbidities, and medications that may affect bladder or sphincter function [28].

* Validated Questionnaires

Standardized tools can quantify symptom severity and track outcomes over time. Commonly used instruments include:

- International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF)
- Expanded Prostate Cancer Index Composite (EPIC)
- Incontinence Impact Questionnaire (IIQ)

These tools are valuable for baseline documentation and longitudinal follow-up [29].

* Physical Examination

A focused physical exam should assess perineal sensation, sphincter tone, and pelvic floor muscle strength. A digital rectal examination (DRE) can evaluate levator ani contraction and exclude rectal pathology. Abdominal and neurological exams may identify contributing factors such as spinal pathology or overflow incontinence due to bladder distension [30].

* Pad Testing

Objective measurement of urine loss can be performed using a standardized pad test, such as the 24-hour pad weight or the 1-hour standardized pad test. A pad weight gain of >2 g is considered abnormal, while >10 g is typically considered clinically significant [31].

* Urodynamic Testing

Multichannel urodynamic studies are not routinely required for all patients but are indicated in cases of complex or refractory incontinence. Urodynamics can distinguish between sphincteric deficiency, detrusor overactivity, and impaired compliance — findings that significantly influence therapeutic decisions [32].

* Cystoscopy and Imaging

Flexible cystoscopy is useful in men with persistent PPI to exclude urethral strictures, bladder neck contracture, erosion from prior devices, or bladder pathology. Imaging studies such as pelvic MRI or ultrasound may be employed to assess sling position or identify pelvic abnormalities in select cases [33].

A structured evaluation ensures accurate diagnosis, facilitates tailored treatment, and minimizes delays in care.

Conservative and Rehabilitative Therapies

Conservative management remains the first-line approach for post-prostatectomy incontinence (PPI), particularly in the early postoperative period. Up to 80% of men regain satisfactory continence within 12 months without the need for surgical intervention [34]. The goal of conservative therapy is to strengthen the pelvic floor, restore sphincter function, and optimize bladder control through non-invasive methods.

* Pelvic Floor Muscle Training (PFMT)

Pelvic floor muscle training (commonly referred to as Kegel exercises) is the cornerstone of conservative therapy. PFMT targets the levator ani and external urethral sphincter, enhancing their ability to contract and maintain continence during increases in intra-abdominal pressure [35].

Studies demonstrate that PFMT, when initiated early and performed correctly, can accelerate continence recovery and reduce the severity of leakage [36]. Training typically involves daily sets of slow and fast contractions, often under the supervision of a physiotherapist.

* Biofeedback

Biofeedback enhances PFMT by providing real-time visual or auditory cues regarding muscle activation. This helps patients correctly isolate and contract the appropriate pelvic muscles,

which many are unable to do effectively on their own [37]. Randomized trials have shown improved continence outcomes when PFMT is combined with biofeedback compared to PFMT alone [38].

* Electrical Stimulation

Transcutaneous or intrarectal electrical stimulation can be used to induce pelvic floor contractions in men unable to perform voluntary contractions. This therapy aims to activate afferent nerves, improve reflex contraction of the sphincter, and promote neuroplasticity [39]. While the evidence is mixed, some studies support its use in conjunction with PFMT, especially in older or neurologically impaired individuals [40].

* Continence Devices and Lifestyle Modifications

- Male incontinence clamps (e.g., Cunningham clamp) provide temporary relief by compressing the urethra externally. These are not curative but may improve quality of life for selected men [41].
- Absorbent products (pads, guards, waterproof underwear) remain necessary for many patients during the rehabilitation period.
- Lifestyle interventions — including fluid management, bladder training, weight loss, smoking cessation, and control of cough-inducing conditions — support recovery and should be routinely addressed [42].

* Timelines and Expectations

Early initiation of PFMT (preferably preoperatively or within 2 weeks post-op) is associated with improved outcomes [43]. If no significant improvement is observed after 6 to 12 months of structured therapy, patients should be evaluated for surgical intervention.

Pharmacologic Management

Pharmacologic therapy plays a limited but adjunctive role in the treatment of post-prostatectomy incontinence (PPI), particularly in men with coexisting bladder dysfunction such as urgency or detrusor overactivity. Medications are not considered first-line treatments for stress-type incontinence caused by intrinsic sphincter deficiency but may be beneficial in specific clinical scenarios.

* Duloxetine

Duloxetine, a serotonin-norepinephrine reuptake inhibitor (SNRI), increases urethral sphincter tone by enhancing the activity of the pudendal nerve. Though approved in Europe for stress urinary incontinence (SUI) in women, its use in men remains off-label [44].

Small randomized trials and observational studies have shown modest benefits in male PPI, particularly when combined with pelvic floor muscle training [45]. However, side effects such as nausea, dry mouth, insomnia, and fatigue often limit tolerability, and the withdrawal rate is high [46].

* Antimuscarinics and β3-Agonists

In men with urgency-predominant or mixed incontinence following radical prostatectomy, treatment targeting detrusor overactivity may be warranted.

- Antimuscarinic agents (e.g., solifenacin, oxybutynin, tolterodine) reduce bladder contractions by blocking muscarinic receptors. These drugs are effective for overactive bladder (OAB) symptoms but carry risks of dry mouth, constipation, and cognitive effects, particularly in older patients [47].
- β3-Adrenergic agonists such as mirabegron offer an alternative with fewer anticholinergic side effects and have been found to be effective in men with post-prostatectomy urgency incontinence [48].

* Alpha-Blockers and 5-Alpha-Reductase Inhibitors

These agents are not typically useful for PPI. Alpha-blockers (e.g., tamsulosin) may actually worsen incontinence by reducing bladder outlet resistance. 5-alpha-reductase inhibitors (e.g., finasteride) are occasionally continued for concurrent benign prostatic hyperplasia but do not improve sphincteric control postoperatively [49].

* Role and Limitations

While pharmacologic therapy may offer symptom relief in selected men, it rarely eliminates incontinence entirely. The role of medications should be viewed as complementary to behavioral and rehabilitative strategies or as temporizing options while awaiting surgical treatment [50].

Surgical Options

When conservative and pharmacologic therapies fail to provide adequate symptom relief after 6 to 12 months, surgical intervention becomes the mainstay of treatment for post-prostatectomy incontinence (PPI). The two most commonly used surgical options are male urethral slings and artificial urinary sphincters (AUS). Procedure selection is guided by the severity of incontinence, patient anatomy, comorbidities, previous surgeries, and patient preference.

* Male Urethral Slings

Male slings are generally indicated for patients with mild to moderate stress incontinence and intact detrusor function.

Types:

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- Transobturator slings (e.g., AdVance, AdVance XP): These devices reposition and compress the bulbar urethra, restoring continence by enhancing coaptation without causing obstruction [51].
- Adjustable slings (e.g., ATOMS, Argus): Offer post-operative adjustability to tailor the degree of compression. Useful for moderate-to-severe cases or patients with variable incontinence severity [52].

Outcomes: Reported cure rates for transobturator slings range from 50% to 70%, with success defined by total dryness or use of one pad per day or less [53]. Adjustable systems may yield higher continence rates but are associated with a greater risk of erosion and infection [54].

Complications: Urinary retention, sling erosion, perineal pain, and infection. Most are minor and manageable [55].

* Artificial Urinary Sphincter (AUS)

The AUS (commonly the AMS 800) is considered the gold standard for severe PPI and for patients with prior pelvic radiation, failed sling procedures, or intrinsic sphincter deficiency [56].

Mechanism: The device consists of a urethral cuff, pressure-regulating balloon, and control pump implanted in the scrotum. The cuff maintains urethral closure and is deflated manually during voiding.

Efficacy: Long-term success rates are high, with dryness or marked improvement reported in 70%–-90% of patients. Patient satisfaction is typically excellent [57].

Complications:

- Mechanical failure: Device revision or replacement is required in up to 30% of patients over 10 years [58]
- Infection or erosion: More likely in irradiated tissues or following prior incontinence surgeries [59]
- Urethral atrophy: May lead to recurrence of leakage and require downsizing or cuff repositioning.

AUS implantation requires patient dexterity, cognitive ability, and motivation to operate the device — important considerations for elderly or neurologically impaired individuals [60].

* Other Surgical Techniques and Emerging Devices

- Bulking agents (e.g., Macroplastique, collagen): Provide temporary improvement by augmenting the urethral wall but have limited efficacy in male SUI and are rarely used today [61].
- Balloon devices (e.g., ProACT system): Periurethral balloons implanted bilaterally to compress the urethra. Adjustable post-operatively, with moderate success rates in select populations [62].
- Stem cell therapies, nerve grafting, and regenerative techniques: These remain experimental but are being investigated as future alternatives to mechanical solutions [63].

Emerging Therapies and Future Directions

Despite the success of current surgical interventions, ongoing research continues to explore less invasive, more durable, and regenerative options for managing post-prostatectomy incontinence (PPI). These approaches aim to restore normal sphincter function and reduce the reliance on mechanical devices.

* Stem Cell Therapy

Stem cell therapy has shown promise in preclinical and early-phase human studies. The rationale lies in the ability of mesenchymal stem cells (MSCs), derived from adipose tissue, bone marrow, or muscle, to regenerate sphincteric tissue and promote angiogenesis and nerve repair [64].

Initial trials have demonstrated feasibility and safety, with modest improvements in continence scores. However, variability in cell type, injection technique, and patient selection has limited reproducibility [65]. Larger randomized trials are required to validate its long-term efficacy.

* Tissue Engineering and Biomaterials

Injectable hydrogels, bioengineered scaffolds, and biocompatible materials are under investigation to support urethral closure and promote tissue healing. Collagen and elastin-based scaffolds may offer temporary support while stimulating native tissue remodeling [66]. These agents are often combined with stem cells or growth factors to enhance sphincter regeneration but remain in the experimental phase.

* Neuromodulation

Sacral neuromodulation and posterior tibial nerve stimulation — typically used for urgency urinary incontinence — are being investigated for their role in mixed and refractory PPI. Though data are limited, neuromodulation may benefit men with coexisting detrusor overactivity or pelvic floor dysfunction [67].

* Personalized and Robotic-Assisted Interventions

The integration of 3D modeling, surgical simulation, and robotic technologies has enhanced precision in sling and AUS placement. Personalized preoperative planning using MRI or ultrasound data can help optimize surgical outcomes and reduce complications [68].

Robotic-assisted sling placement and AUS implantation have been explored at high-volume centers, showing equivalent efficacy with potentially reduced operative morbidity [69].

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Discussion

Post-prostatectomy incontinence (PPI) remains a multifactorial challenge in urologic practice, despite advances in surgical techniques and rehabilitation strategies. Its management demands a nuanced understanding of sphincteric function, patient-specific risk factors, and the spectrum of available treatments.

This review has highlighted that while many men experience transient incontinence in the early postoperative period, a significant minority suffer from persistent symptoms requiring intervention. Early identification of high-risk individuals — including older patients, those with high BMI, pre-existing urinary dysfunction, or prior radiation — allows for tailored counseling and early pelvic floor muscle training, which can reduce the long-term burden of incontinence [1, 5, 13].

Tabela 1: Comparison of treatment modalities for post-prostatectomy incontinence (PPI)

Method	Description	Effectiveness	Invasiveness	Availability
Pelvic floor muscle training (PFMT)	Strengthening exercises with or without biofeedback	Moderate	Non-invasive	High
Pharmacotherapy (e.g., duloxetine)	SNRI to improve urethral sphincter tone	Low–moderate	Non-invasive	Medium
Male sling	Urethral support for mild/moderate PPI	Moderate–high	Minimally invasive	Medium
Artificial urinary sphincter (AUS)	Gold standard for severe PPI; manually operated	High	Invasive	Limited
Regenerative therapies	Stem cells, biologics in trial phase	Promising	Minimally invasive	Low

Tabela 2: Comparison of prostatectomy techniques regarding continence outcomes

Technique	Surgical features	Catheter duration	Continence at 6 mo	Complexity	Retzius-sparing
RRP (open)	Standard open access with higher tissue trauma	10–14 days	50–60%	Moderate	No
LRP (laparoscopic)	Magnification, blood-sparing, no robot	7–10 days	60–70%	High	No
RALP (robotic)	Precision dissection, improved ergonomics	5–7 days	70–80%	High	No
RS-RARP	Preserves Retzius space, better continence	5–7 days	85–95%	Very high	Yes

Tabela 3: Risk factors associated with post-prostatectomy incontinence

Risk factor	Impact on continence
Age > 70 years	External sphincter atrophy, reduced recovery
Obesity (BMI >30)	Lower response to rehab and higher complications
Short membranous urethra	Less urethral length preserved reduces control
Sphincter complex injury	Direct predictor of incontinence
Surgeon experience	Higher risk in low-volume centers
Pre/postoperative radiotherapy	Fibrosis and impaired healing

A structured and stepwise approach to treatment is essential. Conservative therapies, especially when implemented early, play a vital role in the initial management of PPI. Pelvic floor muscle training, when supervised and reinforced with biofeedback, significantly improves the likelihood of early continence recovery [36, 38]. However, expectations must be managed, as these measures are unlikely to yield complete resolution in moderate-to-severe cases.

Pharmacologic interventions may offer symptom relief in selected patients, especially those with urgency incontinence or mixed symptoms, though their role remains limited. The use of duloxetine and β3-agonists may be considered on a case-by-case basis, particularly in those awaiting or not suitable for surgery [45, 48].

Surgical management represents the cornerstone of treatment for men with refractory incontinence. The choice between male slings and artificial urinary sphincters should be individualized. Slings are preferable in men with mild-to-moderate incontinence and preserved urethral function, while the AUS remains the gold standard for severe leakage and those with prior radiation or failed slings [53, 56].

Emerging therapies, including stem cell injections and tis-

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Tabela 4: Recommended clinical interventions depending on severity of PPI

Severity	Clinical profile	Suggested intervention
Mild	Occasional leakage, no pad or 1 pad/day	Pelvic floor training (PFMT), observation
Moderate	Requires 1–3 pads/day, bothersome leakage	PFMT + pharmacotherapy (e.g. duloxetine), consider male sling
Severe	3+ pads/day or total incontinence	AUS implantation, advanced surgical referral
Refractory	Failure of prior interventions, comorbidities	Multidisciplinary approach, regenerative or neuromodulatory trials

sue engineering, may in the future offer less invasive, biologically restorative alternatives. However, these remain in early investigational stages and require further validation in randomized controlled trials [64, 66].

Importantly, shared decision-making is essential at every stage of care. Quality-of-life considerations, patient goals, and functional status must be integrated into treatment planning. Postoperative counseling, mental health support, and patient education about treatment options and realistic outcomes are central to optimizing patient satisfaction and long-term well-being.

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Conclusion

Post-prostatectomy incontinence (PPI) is a common and burdensome complication of radical prostatectomy, with wide-ranging impacts on quality of life, mental health, and daily function. While the natural history of recovery favors improvement within the first year, a substantial proportion of men experience persistent symptoms requiring comprehensive intervention.

Effective management begins with early identification of risk factors and patient education. Conservative treatments, particularly pelvic floor muscle training, form the cornerstone of early therapy and should be initiated preoperatively or shortly after surgery. Pharmacologic agents have limited but adjunctive roles, particularly in cases with mixed urinary symptoms.

For those with refractory incontinence, surgical options offer high success rates. Male slings are effective in selected men with mild-to-moderate symptoms, whereas artificial urinary sphincters remain the gold standard for severe cases. The decision between these options must be individualized, guided by symptom severity, patient preferences, and clinical history.

Emerging therapies, including regenerative medicine and neuromodulation, may redefine future management paradigms but are currently investigational.

Ultimately, a multidisciplinary and patient-centered approach — incorporating urologists, physiotherapists, continence nurses, and mental health providers — is essential to achieve optimal outcomes and restore quality of life in men suffering from PPI.

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Cyryl Rabcewicz, ORCID: 0009-0004-3452-9540, Mateusz Marcinek, ORCID: 0000-0002-5784-5245

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Wkład autorów/authors' contribution: Cyryl Rabcewicz, ORCID: 0009-0004-3452-9540 – główny autor, przygotowujący dane, koncepcja pracy, zebranie dokumentacji medycznej, zebranie materiału, korekta artykułu, poprawianie artykułu; Mateusz Marcinek, ORCID: 0000-0002-5784-5245 – współautor, analityk bibliografii, redaktor ilustracji, redakcja artykułu, edycja tekstu, redakcja części artykułu

Komentarz:

This literature review presents a thorough and well-organized synthesis of current knowledge on post-prostatectomy incontinence. It fulfills the academic standards of a high-quality review by clearly outlining its objective, methodology, and structure.

The article effectively contextualizes the burden of PPI, providing an epidemiological backdrop that underscores the clinical importance of the topic. The treatment sections — especially on pelvic floor rehabilitation and surgical options — are detailed and rich in contemporary references. The authors show methodological rigor by prioritizing randomized controlled trials, systematic reviews, and cohort studies.

One of the major strengths of the review is its balanced tone; it neither underplays the impact of incontinence nor overstates the success rates of interventions. It highlights limitations in current practice and points toward future avenues for research.

Minor improvements could include visual aids (tables, flowcharts) summarizing treatment algorithms and timelines. Overall, this paper is suitable for educational use and may serve as a foundation for clinical guideline development or postgraduate training curricula.

Wiktor Werenkowicz

This article provides a well-structured and up-to-date overview of post-prostatectomy incontinence, combining clinical relevance with academic rigor. Its strength lies in the clear presentation of both conservative and surgical treatments, making it a practical guide for clinicians. The inclusion of emerging therapies adds valuable insight into future directions in urologic care.

Bartłomiej Czarnecki

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