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EFFECTIVENESS OF PELVIC FLOOR MUSCLE TRAINING IN REGAINING CONTINENCE FOLLOWING TURP-INDUCED EXTERNAL SPHINCTER INJURY: A PROSPECTIVE INTERVENTIONAL STUDY

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Abstract

Background: *Stress urinary incontinence (SUI) following transurethral resection of the prostate (TURP) can result from injury to the external urethral sphincter. This study aimed to evaluate the efficacy of pelvic floor muscle training (PFMT) in restoring continence in men with post-TURP sphincteric damage.*

Methods: *A prospective, single-center study was conducted on 48 male patients aged 55–78 years with stress incontinence due to external sphincter trauma post-TURP. Patients underwent a structured, supervised PFMT regimen for 12 weeks. Outcome measures included 24-hour pad weight test, ICIQ-UI SF scores, and patient-reported quality of life. Statistical analysis was performed using SPSS v25. A p-value <0.05 was considered statistically significant.*

Results: *At 12 weeks, 52.1% (n=25) of patients achieved complete continence, while 27% (n=13) showed ≥50% improvement in leakage. Mean pad weight reduced from 234g/day to 48g/day ($p < 0.001$). Mean ICIQ-UI SF score improved from 16.3 to 5.4 ($p < 0.001$). No adverse effects were reported. Patient satisfaction was high.*

Conclusion: *PFMT is a safe and effective conservative therapy for post-TURP incontinence due to external sphincter damage. Early initiation improves outcomes, and integration into post-operative rehabilitation should be encouraged.*

INTRODUCTION

Transurethral resection of the prostate (TURP) is the most widely performed surgical intervention for benign prostatic hyperplasia (BPH) [1]. While generally safe, it carries risks of complications, among which stress urinary incontinence (SUI) due to external urethral sphincter damage is particularly distressing [2].

The male continence mechanism relies heavily on an intact external sphincter and coordinated pelvic floor musculature. Injury to this complex leads to leakage, especially under pressure (cough, lifting, walking). Conservative therapies, particularly pelvic floor muscle training (PFMT), have shown promise in enhancing muscular compensation and improving urethral closure [3,4].

However, most available studies focus on post-prostatectomy (e.g., post-radical prostatectomy) incontinence, with limited data specific to post-TURP sphincter injury. This study evaluates the effectiveness of PFMT in improving continence among patients with confirmed sphincteric damage following TURP.

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2. Methods

2.1 Study Design and Setting

This prospective interventional study was conducted from January 2023 to June 2024 at a tertiary urology center in Pakistan. Ethical approval was obtained from the Institutional Review Board (IRB/UMC/UR-216), and informed consent was secured from all participants.

2.2 Sample Size Calculation

Sample size was calculated using OpenEpi software, assuming an anticipated effect size of 40% improvement with PFMT, 95% confidence level, and 10% dropout rate. The minimum required sample was 43; we enrolled 48 to ensure robustness.

2.3 Inclusion Criteria

Males aged 50–80 years
SUI following TURP with external sphincter involvement (confirmed via video urodynamics or MRI)
Leakage persisting >4 weeks post-op
Willingness to comply with therapy

2.4 Exclusion Criteria

Total incontinence or intrinsic sphincter deficiency (ISD)
Neurological disease (Parkinson's, MS)
History of prior pelvic floor rehabilitation
Active UTI or prostatitis

3. Intervention

Patients were enrolled in a 12-week PFMT protocol guided by a trained physiotherapist. Each patient was instructed to perform:
3 sessions daily, each with 10 repetitions of 10-second pelvic floor contractions
Weekly check-ins for technique reinforcement
Compliance diary maintained by patients
Supervised clinic sessions were conducted biweekly.

4. Outcome Measures

Primary outcomes:
24-hour pad weight test (grams/day)
ICIQ-UI Short Form score
Secondary outcomes:
Self-reported continence status
Satisfaction on a 10-point Likert scale
Assessments were done at baseline, week 4, 8, and 12.

5. Statistical Analysis

Data were analyzed using SPSS v21.0. Quantitative variables were presented as mean ± SD. Paired sample t-tests were used to compare outcomes pre- and post-intervention. A p-value <0.05 was considered statistically significant.

6.1 Baseline Characteristics

6. Results

Characteristic	Value
Mean age	66.3 ± 6.8 years
Mean time since TURP	6.2 ± 2.4 weeks
Mean baseline pad weight	234 ± 68 g/day
Mean baseline ICIQ-UI SF	16.3 ± 2.1
Moderate incontinence	79.1% (n=38)
Severe incontinence	20.9% (n=10)

6.2 Post-PFMT Outcomes

Complete continence (dry): 25 patients (52.1%)
Marked improvement (>50% leakage reduction): 13 patients (27%)
Partial improvement (<50%): 7 patients (14.5%)
No improvement: 3 patients (6.2%)
Mean pad weight decreased from 234g to 48g/day ($p < 0.001$)
Mean ICIQ-UI SF score dropped from 16.3 to 5.4 ($p < 0.001$)
Patients reported increased confidence and reduced social isolation.

7. Discussion

This study confirms the efficacy of pelvic floor muscle training in managing stress incontinence due to external sphincter injury post-TURP. With a 52.1%

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complete recovery rate and a total of 79% showing major improvement, PFMT offers a compelling first-line intervention.

The physiological rationale lies in strengthening the levator ani and improving reflexive pelvic muscle activation, enhancing urethral closure even in the presence of partial sphincter dysfunction [5].

Our findings align with studies on post-prostatectomy incontinence, such as Filocamo et al. [6], who reported a 70% improvement rate with PFMT, though their cohort included radical prostatectomy patients, not TURP cases specifically.

Importantly, our study bridges a literature gap by focusing exclusively on TURP-induced sphincter injury.

8. Limitations

Single-center study limits generalizability.

Small sample size; larger RCTs are needed.

No long-term follow-up beyond 3 months.

Patient-reported outcomes may have recall bias.

Lack of a control group (non-PFMT arm) limits causal inference.

9. Conclusion

Pelvic floor muscle exercises represent an effective, non-invasive, and patient-centered strategy to regain continence in men suffering from TURP-related external sphincter injury. Early initiation, proper technique, and supervised adherence significantly enhance the likelihood of success.

This approach should be integrated into post-operative care protocols for high-risk patients.

10. Conflict of Interest

None declared.

11. Funding

No external funding was used.

12. Ethical Approval

Approved by the Institutional Review Board (IRB/UMC/UR-216). All patients provided written informed consent.

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