Original Research

HERNIA AND BPH: NAVIGATING THE ROUTE FOR SURGICAL DECISION MAKING

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ABSTRACT

Background: Benign prostatic hyperplasia (BPH) and inguinal hernia are common conditions in aging males and frequently coexist due to overlapping risk factors such as chronic straining and increased intra-abdominal pressure. The presence of both conditions presents a clinical challenge in determining optimal surgical sequencing and minimizing postoperative complications.

Aim: To assess the severity of lower urinary tract symptoms (LUTS) and objective bladder outlet obstruction (BOO) parameters in patients with BPH alone compared to those with concomitant inguinal hernia, and to evaluate implications for surgical decision-making.

Methods: This prospective observational study included 29 male patients aged >50 years presenting with LUTS. Patients were divided into two groups: BPH only (n=16) and BPH with inguinal hernia (n=13). Evaluation included International Prostate Symptom Score (IPSS), uroflowmetry (Qmax), post-void residual urine (PVR) measurement, and pressure-flow study where indicated. Comparative statistical analysis was performed between groups.

Results: The BPH with hernia group demonstrated significantly higher mean IPSS (19 vs 12; $p < 0.05$) and significantly lower mean Qmax (7.8 mL/s vs 10.5 mL/s; $p < 0.05$) compared to the BPH-only group. Post-void residual urine volumes were comparable (60 mL vs 55 mL; $p > 0.05$). A higher proportion of bladder outlet obstruction was observed in the combined group (54% vs 44%), although this difference was not statistically significant ($p = 0.58$).

Conclusion: Patients with concomitant BPH and inguinal hernia exhibit greater symptom severity and more pronounced functional obstruction compared to those with BPH alone. Comprehensive preoperative urological evaluation is essential to guide individualized surgical planning and reduce postoperative complications. Multidisciplinary decision-making between urology and general surgery is recommended.

Keywords: Benign Prostatic Hyperplasia, Inguinal Hernia, Lower Urinary Tract Symptoms, Bladder Outlet Obstruction, Uroflowmetry, Post-Void Residual Urine, Pressure-Flow Study, Surgical Decision-Making, Postoperative Urinary Retention.

INTRODUCTION

Benign prostatic hyperplasia (BPH) is one of the most prevalent urological conditions affecting aging men, with histological prevalence exceeding 50% in men over 60 years and up to 80–90% in those over 80 years.[1]

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BPH commonly leads to lower urinary tract symptoms (LUTS), including frequency, urgency, nocturia, weak stream, intermittency, straining, and incomplete emptying. Progressive bladder outlet obstruction (BOO) secondary to BPH may result in acute urinary retention (AUR), recurrent urinary tract infections, bladder decompensation, and renal dysfunction if left untreated.[2]

Current international guidelines emphasize symptom quantification using the International Prostate Symptom Score (IPSS) and objective assessment tools such as uroflowmetry and post-void residual (PVR) measurement in the evaluation of men with LUTS suggestive of BPH.[2,3] A maximum urinary flow rate (Qmax) <10 mL/s is strongly suggestive of obstruction, while pressure-

flow studies (PFS) remain the gold standard for confirming BOO, particularly in complex or equivocal cases.[3] Recent evidence continues to support the role of urodynamic studies in differentiating true obstruction from detrusor underactivity, thereby guiding surgical decision-making.[4]

Inguinal hernia is another highly prevalent condition in elderly men, with lifetime risk estimated at approximately 27% in males.[5] Age-related connective tissue changes and chronically increased intra-abdominal pressure are recognized contributors to hernia formation. Chronic straining associated with untreated LUTS has been proposed as a shared pathophysiological mechanism linking BPH and inguinal hernia.[6] Conversely, unrecognized BOO in patients undergoing hernia repair increases the risk of postoperative urinary retention (POUR), a complication reported in up to 5–25% of cases depending on patient risk factors.[7]

Recent surgical literature highlights that enlarged prostate volume and significant LUTS are independent predictors of urinary retention following inguinal hernia repair.[8] Failure to address underlying obstruction may also increase recurrence risk due to persistent straining. These findings underscore the need for careful preoperative urological assessment in patients presenting with coexisting BPH and inguinal hernia.

Despite the high prevalence of both conditions, clear consensus regarding the optimal sequence of surgical intervention remains limited. Whether to prioritize BPH surgery, hernia repair, or adopt a combined approach depends on symptom severity, objective obstruction parameters, and patient-specific risk factors. Multidisciplinary coordination between general surgery and urology is therefore essential to minimize complications and optimize functional outcomes.

This prospective observational study aims to assess the severity of LUTS and objective bladder outlet obstruction parameters in patients with BPH alone compared to those with concomitant inguinal hernia, and to evaluate their implications for surgical decision-making.

MATERIALS AND METHODS

This prospective observational study was conducted over a period of six months in the Departments of General Surgery and Urology at a tertiary care teaching hospital. The study aimed to evaluate the severity of lower urinary tract symptoms (LUTS) and objective parameters of bladder outlet obstruction (BOO) in patients with benign prostatic hyperplasia (BPH), and to compare findings between patients with BPH alone and those with concomitant inguinal hernia. Institutional Ethics Committee approval was obtained prior to commencement of the study, and written informed consent was secured from all participants in accordance with ethical research standards.

A total of 29 male patients aged more than 50 years presenting with LUTS were enrolled during the study period. Patients were categorized into two groups: those diagnosed with BPH alone (n=16) and those diagnosed with BPH along with clinically confirmed inguinal hernia (n=13). Diagnosis of inguinal hernia was established through detailed clinical examination and supported by ultrasonography where necessary.

Patients were included if they were aged ≥50 years, presented with LUTS, and had a clinical diagnosis of BPH with or without associated inguinal hernia. Patients were excluded if they had a history of previous prostate surgery, neurogenic bladder dysfunction, acute urinary retention at presentation, indwelling urinary catheterization, or known malignancy of the prostate.

All participants underwent a comprehensive clinical evaluation, including detailed history taking, assessment of symptom duration and severity, physical examination, and digital rectal examination (DRE). Comorbid conditions such as diabetes mellitus and hypertension were also recorded.

Severity of urinary symptoms was assessed using the International Prostate Symptom Score (IPSS) questionnaire, a validated tool consisting of seven symptom-related questions addressing incomplete emptying, frequency, intermittency, urgency, weak stream, straining, and nocturia. Each item was scored from 0 to 5, with a total score ranging from 0 to 35. Symptom severity was categorized as mild (0–7), moderate (8–19), or severe (20–35). The quality-of-life component associated with urinary symptoms was also documented.

Objective evaluation of bladder outlet obstruction was performed in all patients. Uroflowmetry was conducted under standardized conditions with patients voiding in a seated position with a comfortably full bladder, ensuring a voided volume of at least 150 mL. The maximum urinary flow rate (Qmax) was recorded, with a value less than 10 mL/s considered suggestive of significant obstruction. Post-void residual urine (PVR) volume was measured immediately after voiding using transabdominal ultrasonography. A PVR of less than 50 mL was considered normal, while volumes exceeding 100 mL were considered indicative of urinary retention.

Pressure-flow studies were performed in selected patients, particularly those with moderate to severe symptoms or inconclusive non-invasive findings. Detrusor pressure at maximum flow (PdetQmax) was measured, and the bladder outlet obstruction index (BOOI) was calculated. BOO was classified according to established urodynamic criteria, with BOOI >40 indicating obstruction, 20–40 considered equivocal, and <20 considered unobstructed.

The primary outcome of the study was the assessment of the severity of bladder outlet obstruction in both groups using IPSS, Qmax, PVR, and pressure-flow study parameters. Secondary outcomes included comparison of obstruction severity between the two groups and evaluation of implications for surgical sequencing between BPH management and hernia repair.

All collected data were entered into a structured database and analyzed using statistical software. Continuous variables were expressed as mean ± standard deviation, and categorical variables were presented as frequencies and percentages. Comparisons between groups were performed using the independent sample t-test for continuous variables and the chi-square test for categorical variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Study Population Characteristics

A total of 29 male patients aged more than 50 years were included in this prospective observational study. Among them, 16 patients (55.2%) were diagnosed with benign prostatic hyperplasia (BPH) alone (Group A), while 13 patients (44.8%) had concomitant BPH and inguinal hernia (Group B). Both groups were evaluated using standardized symptom scoring and objective urodynamic assessment tools.

Symptom Severity Assessment (IPSS)

Assessment using the International Prostate Symptom Score (IPSS) demonstrated a higher symptom burden among patients with concomitant inguinal hernia. The mean IPSS score in the BPH-only group was 12, corresponding predominantly to moderate symptom severity. In contrast, the BPH + hernia group had a mean IPSS score of 19, approaching the severe symptom category. The difference between the two groups was statistically significant ($p < 0.05$).

This finding indicates that patients presenting with both BPH and inguinal hernia experience more pronounced lower urinary tract symptoms compared to those with isolated BPH.

Uroflowmetry Findings (Maximum Flow Rate – Qmax)

Uroflowmetry analysis revealed a reduction in maximum urinary flow rate (Qmax) among patients with concomitant inguinal hernia. The mean Qmax in the BPH-only group was 10.5 mL/s, whereas the BPH + hernia group demonstrated a lower mean Qmax of 7.8 mL/s.

The reduction in urinary flow rate in the combined pathology group was statistically significant ($p < 0.05$). A Qmax value below 10 mL/s is generally suggestive of significant bladder outlet obstruction, and the lower mean flow rate observed in the BPH + hernia group supports the presence of more severe functional obstruction in this cohort.

Post-Void Residual Urine (PVR) Volume

Post-void residual urine volume measured by ultrasonography was comparable between the two groups. The mean PVR in the BPH-only group was 55 mL, while in the BPH + hernia group it was 60 mL.

The difference between groups was not statistically significant ($p > 0.05$). Although patients with concomitant hernia demonstrated more severe symptoms and lower flow rates, residual urine accumulation did not differ substantially between the two cohorts.

Pressure-Flow Study and Bladder Outlet Obstruction

Pressure-flow studies were used to confirm the presence of bladder outlet obstruction (BOO). The proportion of patients demonstrating urodynamically confirmed obstruction was 44% in the BPH-only group and 54% in the BPH + hernia group.

Although the prevalence of obstruction was numerically higher in patients with concomitant hernia, the difference did not reach statistical significance ($p = 0.58$). However, the higher percentage in the combined group supports the trend toward more pronounced obstruction in patients with dual pathology.

Table 1. Distribution of Study Population

Study Group	Number (n)	Percentage (%)
BPH Only	16	55.2%
BPH + Hernia	13	44.8%
Total	**29**	**100%**

Table 2. Comparison of Symptom Severity (IPSS)

Parameter	BPH Only (n=16)	BPH + Hernia (n=13)	p-value
Mean IPSS	12	19	<0.05*

*Statistically significant

Table 3. Uroflowmetry Findings (Qmax)

Parameter	BPH Only	BPH + Hernia	p-value
Mean Qmax (mL/s)	10.5	7.8	<0.05*

*Statistically significant

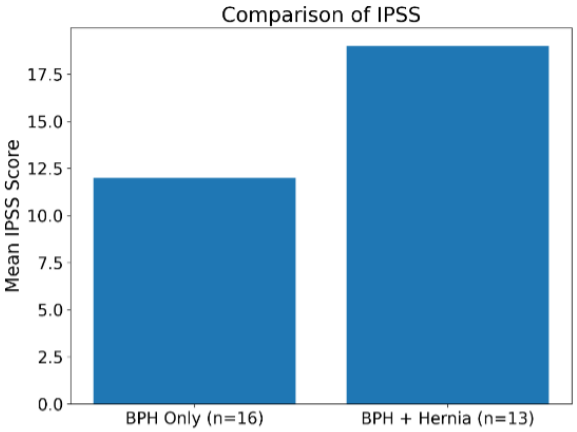
Table 4. Post-Void Residual (PVR) Volume

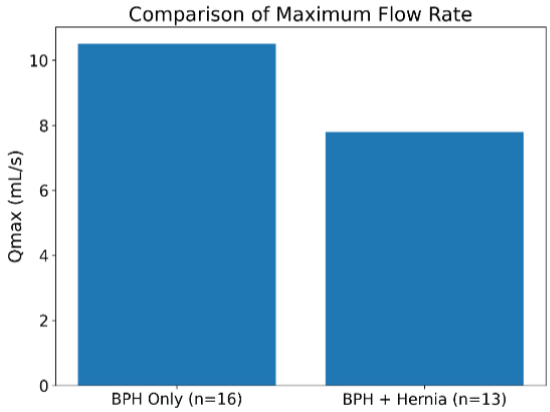
Parameter	BPH Only	BPH + Hernia	p-value
Mean PVR (mL)	55	60	>0.05 (NS)

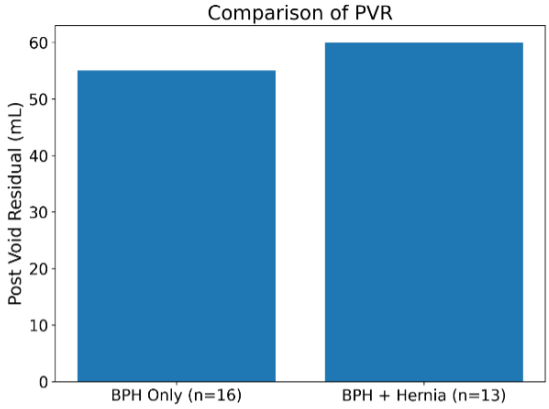
NS – Not Significant

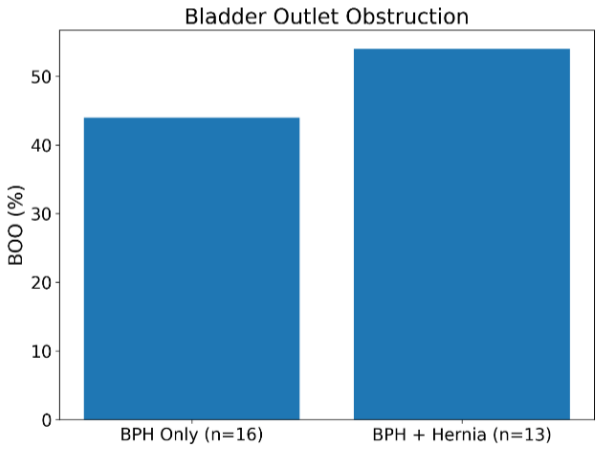
Table 5. Bladder Outlet Obstruction (Pressure-Flow Study)

Parameter	BPH Only	BPH + Hernia	p-value
BOO Present (%)	44%	54%	0.58 (NS)









DISCUSSION

The present study demonstrates that patients with concomitant benign prostatic hyperplasia (BPH) and inguinal hernia exhibit significantly greater lower urinary tract symptom (LUTS) severity and reduced urinary flow rates compared to patients with BPH alone, while post-void residual urine (PVR) volumes remain comparable between groups. The higher mean International Prostate Symptom Score (IPSS) observed in the combined pathology group reflects more advanced symptomatic disease and is clinically significant, as moderate-to-severe LUTS is strongly associated with disease progression and increased likelihood of requiring surgical intervention. The European Association of Urology (EAU) Guidelines emphasize that symptom severity quantified using IPSS plays a central role in risk stratification and management planning in men with LUTS suggestive of BPH[9]. Similarly, the American Urological Association (AUA) guidelines report that higher baseline IPSS scores correlate with poorer quality of life and increased risk of acute urinary retention[10].

The significantly reduced maximum urinary flow rate (Qmax) in the BPH with hernia group further supports the presence of more pronounced functional obstruction. A Qmax below 10 mL/s is widely regarded as suggestive of clinically relevant bladder outlet obstruction when correlated with symptom severity[11]. Abrams et al. demonstrated that combining uroflowmetry with pressure-flow studies improves diagnostic precision in identifying true outlet obstruction and differentiating it from detrusor underactivity[12]. The concordance between elevated IPSS and reduced Qmax in the present study strengthens the inference that patients with dual pathology experience increased outlet resistance.

Despite these findings, PVR volumes did not significantly differ between the two groups. Previous literature has shown that residual urine volume may not always directly correlate with obstruction severity, particularly in patients with compensated detrusor function[13]. Yoshimura and Homma highlighted that pressure-flow studies remain the gold standard for confirming bladder outlet obstruction and should be considered in complex clinical scenarios[14]. Although a higher proportion of patients in the BPH with hernia group demonstrated confirmed obstruction on pressure-flow studies, the difference did not reach statistical significance, which may be attributable to the limited sample size.

The coexistence of BPH and inguinal hernia can be explained by shared pathophysiological mechanisms. Chronic straining secondary to untreated outlet obstruction increases intra-abdominal pressure, thereby contributing to hernia formation and potentially increasing recurrence risk after repair[15]. Connective tissue remodeling and age-related collagen alterations have also been implicated in the pathogenesis of inguinal hernia, mechanisms that overlap with structural changes observed in aging males with prostatic enlargement[16]. Leipzig et al. reported that prostatic enlargement and obstructive symptoms can influence perioperative outcomes in patients undergoing inguinal hernia repair, reinforcing the importance of preoperative urological evaluation[17].

Furthermore, unrecognized bladder outlet obstruction is a known risk factor for postoperative urinary retention following inguinal hernia repair. Baldini et al. identified advanced age and preexisting LUTS as independent predictors of postoperative urinary retention, emphasizing the need for careful perioperative assessment[18]. Therefore, the findings of the present study underscore the importance of multidisciplinary decision-making between urology and general surgery teams when managing patients with concomitant BPH and inguinal hernia.

Although the sample size limits statistical generalizability, this study provides prospective comparative data integrating symptom scoring with objective urodynamic parameters. The association between concomitant hernia and increased symptom

severity highlights the need for individualized surgical planning and comprehensive preoperative urological assessment to minimize postoperative complications and optimize patient outcomes.

CONCLUSION

This study demonstrates that patients with concomitant benign prostatic hyperplasia (BPH) and inguinal hernia exhibit significantly greater lower urinary tract symptom severity and reduced urinary flow rates compared to patients with BPH alone, although post-void residual volumes remain comparable. The findings highlight the importance of comprehensive preoperative urological evaluation, including symptom scoring and objective flow assessment, in patients presenting with both conditions. An individualized, multidisciplinary approach involving both urology and general surgery is essential to optimize surgical sequencing, minimize postoperative complications such as urinary retention, and improve overall patient outcomes.

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