

Original Article

A Preoperative Urodynamic Evaluation Can Change the Surgical Decision for BPH Patient: A Case Report

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Abstract - Benign Prostatic Hyperplasia (BPH) is a common condition that can lead to Bladder Outlet Obstruction (BOO) and is typically managed surgically following a confirmed diagnosis via urodynamic study. In this case report, we emphasize the significance of urodynamic evaluation in the preoperative assessment of a patient with Lower Urinary Tract Symptoms (LUTS) suggestive of Benign Prostatic Hyperplasia (BPH) who is scheduled for surgical intervention. Despite clinical indications pointing towards BPH, the patient's urodynamic evaluation unexpectedly revealed the presence of Detrusor underactivity rather than obstruction, highlighting the critical role of urodynamic assessment in the accurate diagnosis and management of patients with LUTS.

Keywords - Urodynamic evaluation, Surgical decision, BPH patient.

1. Introduction

Benign Prostatic Hyperplasia (BPH) refers to the non-malignant growth of the prostate observed very commonly in aging men. Although on the surface this statement seems straightforward and simple, there are considerable definitional problems associated with the condition that subsequently lead to problems with epidemiologic definitions, calculations of incidence, prevalence rates, ultimately, and difficulties with formalizing therapeutic algorithms [1].

BPH can cause Lower Urinary Tract Symptoms (LUTS), which include voiding or obstructive symptoms such as hesitancy, poor and/or intermittent stream, straining, prolonged micturition, feeling of incomplete bladder emptying, dribbling, etc, and storage or irritative symptoms such as frequency, urgency, urge incontinence, and nocturia. These symptoms can range from mild to severe and may negatively impact a patient's quality of life [2].

One of the most common complications of BPH is Bladder Outlet Obstruction (BOO), with an increasing incidence in men over 50 years of age, leading to increased residual urine, frequent urinary tract infections, and a decrease in the bladder's functional capacity [3].

Surgical intervention is a viable option for treating patients with moderate-to-severe LUTS secondary to BPH who have failed medical therapy for more than 6 months but

can lead to postoperative complications and suboptimal outcomes if not carefully selected [4].

The mechanism for surgery is based on the classic Bladder Outlet Obstruction (BOO) model. Enlarged prostate tissue causes obstruction and increases the urethral resistance to flow, and therefore, requires higher intravesical pressure to void. The Urodynamic Study (UDS) is the only gold standard for the diagnosis of BOO; however, invasiveness, cost, and morbidity of UDS limit its clinical use. In this regard, most guidelines recommend UDS for male LUTS evaluation only in specific situations [5].

Preoperative urodynamic evaluation of patients with symptomatic BPH may help identify those patients who are unlikely to benefit from surgical treatment or may require alternative management strategies. On the other hand, routine use of urodynamic testing in the surgical evaluation of symptomatic BPH patients is still a matter of debate, as some studies found equivocal or limited benefits of urodynamics testing in clinical practice [5].

Detrusor Underactivity (DU) is a contraction of reduced strength and/or duration, resulting in prolonged bladder emptying and/or a failure to achieve complete bladder emptying in a normal time span. DU is frequently observed in patients with Lower Urinary Tract Symptoms (LUTS) due to Benign Prostatic Hyperplasia (BPH) and can be detected by urodynamic studies. During urodynamic evaluations, various parameters, such as detrusor pressure at maximum



flow (PdetQmax), maximum flow rate (Qmax), Post-void Residual Volume (PVR), Bladder Contractility Index (BCI), and Bladder Outlet Obstruction Index (BOOI) are used to determine bladder contractility [6].

When BPH coexists with detrusor underactivity (DU), a weak bladder contraction, treatment focuses on improving bladder emptying and managing prostate enlargement. The management includes Behavioural Techniques, Medications, Intermittent Catheterization, Surgery, Sacral neuromodulation, and Botulinum toxin injections [7].

2. Case Report

A male patient, aged 61 years, presented to the urology clinic at Tishreen University Hospital on 23 March 2023 with bothersome Lower Urinary Tract Symptoms (LUTS), including weak urinary stream, hesitancy, nocturia, urinary retention, Incomplete emptying, and Dribbling at the end of urinating.

The patient has a previous diagnosis of Benign Prostatic Hyperplasia (BPH) and has been on medication for the past 7 months.

His International Prostatic Symptom Score (IPSS) was found to be 21. During the clinical examination, a palpable bladder was noted on abdominal examination without any other abnormalities in the genitourinary region. However, the abdominal ultrasound examination revealed a post-void residual volume (PVR) of 200 mL and a prostate size of 68cc.

A cystoscopy was performed to assess the length of the prostatic urethra and the size of the median lobe. The examination revealed an enlarged median lobe with good mobility of the prostatic urethra; all the previous findings confirm Benign Prostatic Hyperplasia (BPH), and surgery was recommended. However, prior to the scheduled surgery, a preoperative urodynamic assessment was performed to evaluate bladder function and exclude other causes of LUTS.

During the urodynamic study, the patient showed a detrusor pressure at a maximum flow (PdetQmax) of 22 cmH₂O and a maximum flow rate (Qmax) of 8 mL/s. These results allowed for the calculation of the Bladder Contractility Index (BCI) and the bladder outlet obstruction index (BOOI), and the values were found to be BCI=62 and BOOI=6 cm H₂O. These findings indicated detrusor underactivity with no bladder outlet obstruction, in contrast to what is typical for patients with BPH. As a result, surgical intervention for BPH was deemed unnecessary, and alternative management options were explored.

Based on the urodynamic study findings, the patient has been diagnosed with detrusor underactivity. Considering the

patient's overall condition, clinical presentation, and all investigative results, the decided treatment plan is Sacral Neuromodulation (SNM), a minimally invasive treatment option for LUTS caused by detrusor underactivity, instead of Transurethral Resection of the Prostate (TURP). SNM involves implanting a small device that sends electrical pulses to the sacral nerves, leading to improved bladder function.

Following the SNM procedure, the patient reported significant improvement in his LUTS, including a reduction in hesitancy, weak stream, and nocturia. The patient was satisfied with the outcome of the procedure and did not require further surgical intervention.

This case report emphasizes the significance of urodynamic evaluation to guide the optimal management of patients with LUTS attributed to BPH. It highlights the importance of considering alternative management strategies in cases where typical urodynamic findings are not observed.

3. Discussion

While BPH is a prevalent condition, its definition and diagnosis are not always straightforward. LUTS, while often associated with BPH, can arise from various other causes, necessitating thorough evaluation. This complexity can lead to challenges in epidemiological studies and treatment decisions. BOO, a significant complication of BPH, can worsen LUTS and lead to further complications like urinary tract infections and reduced bladder capacity. Accurate diagnosis of BOO is crucial for determining appropriate treatment strategies.

Surgery offers a potential solution for moderate-to-severe LUTS due to BPH, but it carries inherent risks and may not be suitable for all patients. Preoperative evaluation, including urodynamic studies, can help identify those who are unlikely to benefit or require alternative approaches.

Urodynamic Studies (UDS) serve as the gold standard for diagnosing BOO but are invasive and costly. The debate regarding routine use of UDS in BPH management continues, with some studies questioning its clinical benefit while others emphasize its value in specific situations, such as identifying DU.

DU, characterized by a weak bladder contraction, often coexists with BPH and can significantly impact treatment decisions. UDS plays a crucial role in identifying DU by assessing parameters like detrusor pressure, flow rate, and post-void residual volume.

In this case, UDS prevented unnecessary surgery for presumed BPH-related BOO, highlighting the importance of confirming the diagnosis before invasive interventions.

With the diagnosis of DU established, the focus shifted towards appropriate management strategies for this condition, such as behavioural modifications, intermittent catheterization, or emerging therapies.

In discussing this study in the context of existing literature, it is necessary to explore how these findings correlate with or diverge from other significant research in the field of urology pertaining to Benign Prostatic Hyperplasia (BPH).

The study of Mehdizadeh and Leach (2009) provides an overview of the role of invasive urodynamic testing in the management of BPH and male LUTS. The authors explain that urodynamic testing can provide valuable information for surgical decision-making, particularly in complex cases. However, they caution that urodynamic testing should not be used as the sole basis for surgical decision-making. They recommend that urodynamic testing should be used in conjunction with other diagnostic tests, such as cystoscopy and imaging studies, to provide a comprehensive assessment of the patient's condition. They also emphasize that urodynamic testing should be used judiciously and in conjunction with other diagnostic tests to provide a comprehensive assessment of the patient's condition [8].

This case report underscores the importance of Urodynamic Studies (UDS) in the pre-operative evaluation of patients with Lower Urinary Tract Symptoms (LUTS)

suggestive of BPH. While BPH with Bladder Outlet Obstruction (BOO) is a common cause of LUTS and is often managed surgically, relying solely on clinical symptoms can lead to misdiagnosis and inappropriate interventions.

4. Conclusion

In this instance, UDS effectively prevented an unnecessary surgery for presumed BPH-related BOO. By identifying DU as the underlying cause of the patient's LUTS, the focus shifted towards appropriate management strategies tailored to this specific condition. This case serves as a testament to the importance of comprehensive evaluation and accurate diagnosis in optimizing patient care and improving outcomes.

As we move forward, further research and technological advancements will undoubtedly refine our understanding of BPH and LUTS, leading to more individualized and effective treatment approaches. However, the fundamental value of urodynamics in discerning the complexities of lower urinary tract dysfunction remains clear. By illuminating the path towards accurate diagnosis and personalized management, urodynamics plays a critical role in improving the quality of life for men grappling with BPH and its associated challenges.

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