



# A case report to a successful surgical treatment of non-catheter dependent benign prostatic hyperplasia as a cause of non-dilated obstructive uropathy

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## ABSTRACT

Large benign prostatic hyperplasia (BPH) that obstructs the urinary bladder neck was a known cause of acute renal dysfunction. However, it is rare to get renal impairment in a non-dilated upper tract caused by BPH. We are reporting a case of a man who presented to our urology unit with remarkable renal impairment due to concurrent BPH, with no evidence of a dilated system. The patient is a 65-year-old man who presented to our urology unit for the complaints of severe irritative and obstructive symptoms of the lower urinary tract for the past few months. Initial renal function test showed severe renal impairment and ultrasound of kidney urinary and bladder (KUB) revealed normal bilateral kidneys with no evidence of hydronephrosis bilaterally. The patient subsequently underwent transurethral resection of the prostate (TURP) in our centre and his kidney function instantaneously returned to normal before discharging home. Dilated urinary system in obstructive uropathy does not always correspond to the degree of obstruction as in our case. Thus, immediate intervention to release obstruction in a non-dilated urinary system due to bladder neck obstruction is recommended.

### *Implication for health policy/practice/research/medical education:*

NDOU due to bladder neck obstruction caused by benign prostatic hyperplasia is a rare condition. We are reporting a case, showing that, immediate surgical intervention such as TURP can immediately reverse acute kidney injury.

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## Introduction

Obstruction to the urinary tract is a frequent cause of renal dysfunction (1). One of the known causes for urinary obstruction in male is benign prostatic hyperplasia (BPH) that cause bladder neck obstruction (1). While it is well-known that the hallmark of obstructive uropathy is the dilatation of the urinary system, it is interesting to note that renal dysfunction due to BPH may also present without any evidence of dilated urinary system and this condition is called non-dilated obstructive uropathy (NDOU).

NDOU with acute kidney injury is rare but well reported in a few works of literature. Its incidence was reported to be around 4-5% in all cases of urinary obstruction (2). In our reviews, the first case of NDOU was reported by Ormand et al in 1948 in a patient with retroperitoneal

fibrosis (3). Maillet et al reported that 4 out of 80 cases of ureteric obstruction were found to have a non-dilated system (2). To date, the incidence of NDOU specifically due to BPH is still unknown. We presented a case of a man presented to our urology unit with remarkable renal impairment due to concurrent BPH, with NDOU. The patient underwent transurethral resection of the prostate (TURP) in our centre and before discharge, his kidney function instantaneously returned to normal thus highlighting the role of early TURP as surgical treatment in NDOU due to BPH.

## Case Presentation

A 65-years-old man presented to our urology unit for the complaints of severe irritative and obstructive symptoms

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of the lower urinary tract for the past few months. He has been prescribed tamsulosin tablet during clinic follow up. We noted his baseline prostate-specific antigen was high (22 ng/mL). Due to suspicion of prostate malignancy, he was subsequently arranged for a transrectal ultrasound-guided biopsy of the prostate (TRUS biopsy). The histopathological result reported BPH and after the biopsy, he was allowed to discharge. He presented back to the emergency unit after a week with the complaint of severe obstructive urinary symptoms described as worsening of voiding, poor urine stream, and hesitancy. Otherwise, he has no history of diabetes mellitus, hypertension, or consuming any steroid-based drugs or traditional medications prior.

On physical examination, he was afebrile, not in sepsis, alert and all his vital signs were stable. Upon palpation of the abdomen, a distended urinary bladder can be felt at the suprapubic region with minimal tenderness. Full blood count revealed no leucocytosis with the white cell count of  $5.8 \times 10^9/L$  and the renal function test showed evidence of renal dysfunction. Urea level was 25 mmol/L and creatinine was 586  $\mu\text{mol/L}$  with normal electrolytes parameters. Ultrasound of kidney urinary and bladder (KUB) was done and revealed a normal image of bilateral kidneys with no evidence of hydronephrosis or hydroureter (Figures 1 and 2). His prostate gland otherwise, was grossly enlarged with lobulated appearances and indented into the urinary bladder posteriorly. Gland volume noted to be measured at 80 mL with intravesical prostatic protrusion (IPP) of 53.4 mm (grade III) (Figure 3).

He was immediately started on intravenous hydration with saline infusion and a urinary catheter was inserted to immediately relieve his symptoms although he was still able to urinate. Post bladder catheterization showed remarkable improvement in the renal profile in the following days. Urea level decreased from 22 mmol/L to 19 mmol/L and creatinine from 586  $\mu\text{mol/L}$  to 384  $\mu\text{mol/L}$ . Due to severe lower urinary tract obstructive symptoms and significant renal impairment despite any evidence of dilated uropathy, we proceeded with TURP using bipolar Gyros™ system TURP on day 2 of admission.

Intraoperative findings showed very occlusive prostate with kissing lateral lobes, severe trabeculation, sacculation of the urinary bladder and prominent prostatic median lobes. 70gram of prostatic tissues were resected and postoperatively he was kept on hydration with daily renal function monitoring. Histopathological examination result came back as BPH and his renal profile normalized (5.2 mmol/L and creatinine of 100  $\mu\text{mol/L}$ ). Postoperatively he has a good urinary function and allowed discharge after 72 hours. Upon our follow up, the patient has satisfactory urination and no significant recurrence of obstructive lower urinary tract symptoms.

## Discussion

Urinary retention due to prostatic hypertrophy may lead



**Figure 1.** Ultrasound depicts normal size of the right kidney; length of 11.9 cm and parenchymal thickness of 1.1 cm. No hydronephrosis.



**Figure 2.** Left kidney shows normal size; length of 10.2 cm and parenchymal thickness of 1.0 cm. No evidence of hydronephrosis.



**Figure 3.** Ultrasound of urinary bladder shows grade III intravesical prostatic protrusion measuring 53.4 mm.

to the post-renal cause of acute kidney injury which may complicate end-stage renal disease if left untreated (1). If this severe complication happens, it is typically characterized by the findings of bilateral hydroureter and hydronephrosis (1). However, in rare conditions, despite high suspicion on the postrenal cause of obstruction, imaging may reveal a non-dilated urinary system. This phenomenon is called NDOU and well demonstrated as in our case.

The predisposing factors for NDOU are acute renal failure in the elderly, flank abdominal pain with haematuria, dissociation of high serum creatinine on admission with absent uremic symptoms, and patients with a history of advanced abdominopelvic malignancy (2,4). NDOU also can be caused by acute urinary obstruction with concomitant dehydration, hypotension, severe oliguria, and the presence of retroperitoneal fibrosis (3).

Pathophysiology of this condition can be explained by an acute precipitating event such as infection, mucosal oedema, and blockage of the system by cellular debris and long-standing disruption of normal ureteral peristalsis such as in retroperitoneal fibrosis (3). Lyons et al described in a report, in an acute event, the level or cause of obstruction may not be evident by imaging after 24-48 hours of obstruction (5). As in our case, we postulated that our patient developed subclinical prostatitis due to a TRUS biopsy or subclinical urinary tract infection causing acute urinary obstruction leading to rapid acute kidney injury.

Many works of the literature showed dramatic recovery of renal function if interventions are done by relieving the obstruction in NDOU of any cause (4). In a report published by Aaron Spital et al, they recommend measures that immediately relieve obstruction together with a making definitive diagnosis and these are safe in clinical practice (7). Examples of the measures are percutaneous nephrostomy with antegrade pyelogram or ureteral catheters placement with retrograde pyelography (7,8). By prompt intervention, irreversible loss of renal function otherwise can be prevented. In our case, since the pathology was due to bladder neck obstruction secondary to BPH, we proceeded with TURP, a definitive treatment.

Regarding our approach, we opted to follow the recommendation by the American Urological Association Guideline on the management of BPH (9). Surgical intervention is an appropriate treatment alternative for patients with moderate-to-severe lower urinary tract symptoms (AUA-SI score >8) and for patients who have developed acute urinary retention or other BPH-related complications such as bladder neck obstruction (9). American Urological Association 2021 Guideline also recognized that TURP remained the benchmark for therapy in a complicated BPH (10).

A study comparing TURP versus watchful waiting in patients with the moderate symptom of BPH demonstrated that TURP was statistically associated with improved peak flow rate and less urine residual volume and overall improvement with genitourinary symptoms (11). In our case, after a discussion about the risk and benefits of all available options, the patient opted for TURP as well and as a result, he showed rapid recovery with remarkable improvement of symptoms and renal functions.

## Conclusion

In conclusion, clinicians must be more cautious in assessing non-dilated urinary systems in patients presenting with acute kidney injury and the degree of hydronephrosis does not always correspond to the degree of obstruction. The appropriate management is according to the aetiological cause. As in our case urinary catheterisation followed by TURP was chosen to release the obstruction in a non-dilated urinary system.

## Authors' contribution

NH and MA were the principle investigators of the study. WZ, SR and IS revisited the manuscript and critically evaluated the intellectual contents. All authors participated in preparing the final draft of the manuscript, revised the manuscript and critically evaluated the intellectual contents. All authors have read and approved the content of the manuscript and confirmed the accuracy or integrity of any part of the work.

## Conflicts of interest

The authors declare that they have no competing interests.

## Ethical issues

This case report was conducted in accord with the World Medical Association Declaration of Helsinki. Written informed consent was obtained from the patient for the publication of this case. Additionally, ethical issues (including plagiarism, data fabrication, double publication) were completely observed by the authors.

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