

Brunn Cyst: A Rare Cause of Bladder Outlet Obstruction

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Abstract

Von Brunn cysts are formed by pinching off of epithelial nests from urothelial buds and rarely cause bladder outlet obstruction, with only 10 such cases reported in the literature. A young man presented with new-onset obstructive voiding symptoms. Cystoscopy confirmed the ultrasound and computed tomography findings of a midline cystic lesion at the bladder neck, above the prostate parenchyma, located anteriorly spanning from 11 to 1 o'clock. A possible ball valve effect of the cyst at the bladder neck was causing obstruction. Transurethral rerooting and cyst resection resulted in complete resolution of the voiding symptoms.

Keywords: Bladder outlet obstruction, Von Brunn cyst, bladder neck cyst, endourology, pathology, radiology

Introduction

Bladder outlet obstruction is mostly attributable to benign prostatic hyperplasia (BPH) in elderly men and urethral stricture disease in young and middle-aged populations. Israel Franco, in 1988, first reported Brunn's cyst as a cause of bladder neck obstruction in a young male (1). These cysts form as a result of pinching off of epithelial nests from urothelial buds. They are seldom encountered in the bladder neck region, and when large, they may be a rare cause of bladder outlet obstruction. Von Brunn cysts are commonly found in the trigone but are not always visible on endoscopy or imaging. Histologically, they are characterized by solid nests of benign urothelial cells sequestered in the lamina propria or submucosa (2). Von Brunn's cyst causing bladder outlet obstruction is an infrequent entity, and less than 10 such cases have been reported in the literature till date, all of which were described in males.

Case Presentation

A healthy man in his mid-30s presented with recent onset predominantly obstructive voiding symptoms. He complained of weak stream, intermittency, incomplete emptying, hesitancy, nocturia, and occasional burning micturition in the past 2 months. His International Prostate Symptom score was 13 and his bother score was 4. No history of diabetes, hypertension,

smoking, previous surgery or catheterization. The patient had a normal external urethral meatus, and systemic examination, including a focused neurological assessment, revealed no abnormality. Written informed consent was obtained from the patient prior to publishing the case-related information in this case report.

Urinalysis, urine culture, and renal function tests were normal. Uroflowmetry revealed a peak flow rate of 6 mL/s and an average flow rate of 2.7 mL/s in a voided volume of 279 mL.

Ultrasound of the kidneys, ureter, and bladder (Figure 1A) showed a round cystic lesion 1.5 x 1 cm noted within the bladder, near the neck, without any prostatomegaly or hydronephrosis. However, the patient had an elevated post-void residual volume of 150 mL (Pre void- 450 mL).

Computed tomography (Figure 1B, C) showed a well-defined non-enhancing midline cystic lesion in the bladder neck region measuring 1.9*1.8*1.3 cm without any evidence of a solid enhancing component or calcification. The upper tracts were essentially normal.

The excretory phase of contrast-enhanced computed tomography, which showed a cystic lesion seen as a filling defect in the bladder neck region, helped us to rule out the possibility of an ectopic ureter with ureterocele. We proceeded with a working diagnosis of bladder neck or prostatic cyst. During cystoscopy, a normal prostatic urethra and intravesical

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extension of the cystic lesion above the prostatic parenchyma helped us confirm the diagnosis of bladder neck cyst- "Von Brunn cyst".

Cystourethroscopy demonstrated a normal anterior and posterior urethra, non-obstructing prostate, with a bulge/spherical cyst at the bladder neck located anteriorly spanning from 11 to 1 o' clock position (Figure 2A). This cyst obstructs the bladder outflow possibly by a ball valve effect. The bladder wall showed mild trabeculation with normal urothelium and ureteric orifices. Transurethral reroofing and resection of the bladder neck cyst were performed, and a per urethral Foley catheter was maintained for 48 h.

Histopathological examination revealed few cystic dilated glands lined by transitional epithelium, along with chronic inflammatory cells in the lamina propria and foci of lymphocytic aggregates at places (Figure 2B). These features are suggestive of chronic non-specific inflammation with Cystitis Glandularis.

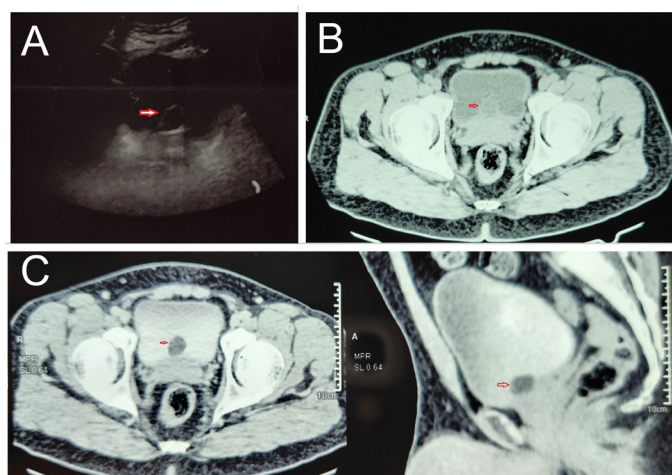


Figure 1. A. Ultrasound image showing a small cystic lesion (arrow) in the bladder neck region above the prostate. B. Midline cystic lesion measuring 1.9*1.8*1.3 cm at the level of the urinary bladder neck on plain computed tomography (CT). C. Contrast-enhanced CT showing bladder neck cyst as a filling defect, without any evidence of a solid-enhancing component or calcification

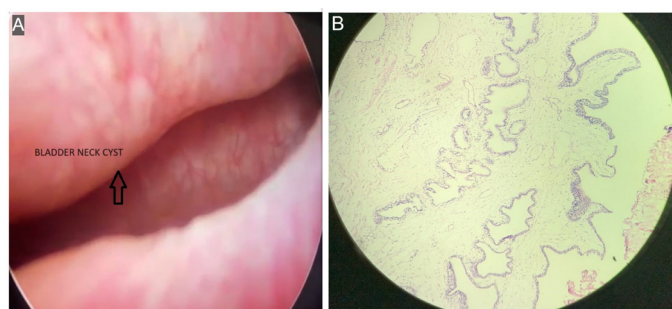


Figure 2. A. Cystoscopic evaluation of the patient's anterior cyst seen at the bladder neck. B. Histopathological microscopic image showing few cystic dilated glands lined by transitional epithelium along with chronic inflammatory cells and foci of lymphocytic aggregates in the lamina propria

At 1-month follow-up, the patient's voiding symptoms had resolved completely. There was no postvoid residual urine volume on ultrasound imaging. Uroflowmetry showed significant improvement with a peak flow rate of 30 mL/s and an average flow rate of 19 mL/s in a voided volume of 210 mL.

Discussion

This patient had a rare cause of benign lower urinary tract obstruction attributable to Brunn's cyst in the bladder neck, unlike commonly encountered causes like BPH in middle-aged or elderly patients and stricture in the young. A literature search revealed around 9 such cases of bladder neck cysts causing obstructive lower urinary tract symptoms, most of which were young or middle-aged males (Table 1). Further, as observed in similar cases reported in the literature, the lower urinary tract symptoms disappeared following transurethral resection of the cyst, thereby suggesting that a possible ball valve effect of the cyst at the bladder neck was responsible for the obstruction. Ultrasonography and endoscopy are sufficient to diagnose Brunn's cyst. However, other imaging modalities like intravenous urography or computed tomography, as performed in our case, may aid in the diagnosis (3).

The differential diagnosis of cystic lesions near the bladder neck includes prostatic cysts and ureterocele. Rarely, inflammatory conditions of the bladder-like cystitis cystica may lead to small filling defects in the bladder wall, which, under rare circumstances, manifest as large cystic lesions. Prostatic cysts are usually intraparenchymal and tend to originate from posterior structures like prostatic utricle or ejaculatory duct. Although rare, these infra-vesical cystic lesions of the prostate may be associated with lower urinary tract symptoms (4). Brunn's cyst in our case was located anteriorly at the bladder neck and above the prostatic parenchyma.

The other important diagnosis to be considered is ureterocele resulting from ectopic ureteric insertion. This can also appear as a cystic lesion near the neck of the bladder. However, ureteroceles are mostly congenital, associated with duplex collecting systems, and present at an early age (5). The von Brunn cyst is a benign condition with no reported recurrence in the current literature and needs no long-term follow-up.

Conclusion

Brunn's cyst should be considered as a rare benign cause of new-onset obstructive lower urinary tract symptoms in young patients, which can cause obstruction at the bladder neck by the ball valve effect. Ultrasound and computed tomography will aid in the diagnosis of this condition, which can be confirmed during cystoscopy. Transurethral reroofing and resection resulted

Table 1. Cases of bladder neck cyst causing lower urinary tract symptoms reported in the literature. A summary of the case details and treatment is provided

	Cases reported in literature	Case details	Treatment
1.	Brunn cyst as a cause of bladder outlet obstruction: a case report Insuan and Insuan (6)	<ul style="list-style-type: none"> • 45-year-old male. • Cystic lesion at the bladder neck, approximately 1.6x1.7x2.0. 	Transurethral resection of the bladder neck cyst.
2.	Bladder outlet obstruction secondary to Brunn's cyst: A rare presentation in a young man Baarimah et al. (7)	<ul style="list-style-type: none"> • 21-year-old male. • Brunn's cyst was confirmed on ultrasonography and magnetic resonance imaging. 	Managed by endoscopic de-roofing of the cyst.
3.	Brunn's cyst: A rare cause of lower urinary tract symptoms Ilyas et al. (8)	<ul style="list-style-type: none"> • 53-year-old male. • A 7 mm × 8 mm, small, well-defined cystic lesion at the bladder neck. • Intravenous urography revealed a small filling defect in the region of the bladder neck. 	Transurethral de-roofing and cyst resection.
4.	Transurethral resection of an uncommon Brunn's cyst: A resolution for lower urinary tract symptoms Dongsu et al. (9)	<ul style="list-style-type: none"> • 44-year-old male. • Ultrasonography revealed an isolated cystic lesion, 1.12x0.72x0.73 cm in dimensions, at the bladder neck. 	Bruun's cyst located in the bladder neck was excised using a cystoscopic approach.
5.	Bladder Outlet Obstruction Secondary to a Brunn Cyst Grimsby et al. (3)	<ul style="list-style-type: none"> • 43-year-old male. • Renal and bladder ultrasound revealed a cystic structure in the bladder. 	Transurethral unroofing and resection of cystic lesion.
6.	Brunn cyst causes obstructive LUTS Ren et al. (10)	<ul style="list-style-type: none"> • 37-year-old male. • Ultrasound of the kidneys, ureter, and bladder showed a 1.7 cm thin-walled midline cystic structure in the bladder neck, abutting the ureteric orifice. 	Transurethral resection of bladder neck.
7.	Bladder Neck Obstruction Secondary to Brunn's Cyst Franco et al. (1)	<ul style="list-style-type: none"> • 29-year-old male. • Cystogram showing a thickened and heavily trabeculated bladder. 	Mass drain and unroofed using transurethral resection loop.
8.	Brunn's Cyst Induces Persistent Lower Urinary Tract Symptoms in a Young Man: A Case Report Lindner et al. (11)	<ul style="list-style-type: none"> • 46-year-old male. • Sonographic and cystoscopic examination revealed a cystic lesion located at the bladder neck. 	Transurethral reroofing and cyst resection.
9.	Brunn's Cyst: A Rare Cause of Bladder Outlet Obstruction in a Young Man Sailo and Sailo (12)	<ul style="list-style-type: none"> • 27-year-old male. • Bladder ultrasound showed a 1.4x1.2 cm cystic mass at the bladder neck. 	Transurethral de-roofing and resection of the cystic mass were performed using resection loop.

in complete resolution of voiding symptoms. Considering the benign nature of this entity, no long-term follow-up is recommended.

Ethics

Informed Consent: Written informed consent was obtained from the patient prior to publishing the case-related information in this case report.

Footnotes

Authorship Contributions

Surgical and Medical Practices: S.B.P., Concept: S.B.P., B.S.P., Design: S.P., Data Collection or Processing: B.S.P., M.K.V., Analysis or Interpretation: V.S.K., Literature Search: V.S.K., Writing: M.K.V.

Conflict of Interest: No conflict of interest was declared by the authors.

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