



Giant Urinary Bladder Diverticulum with Intraluminal Calculi Presenting as Acute Oliguria in an Elderly Female: A Radiological Diagnostic Challenge

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Abstract

Urinary bladder diverticula are herniations of the bladder mucosa through the detrusor muscle and may be congenital or acquired, most commonly secondary to chronic bladder outlet obstruction in elderly patients. While most bladder diverticula are small and asymptomatic, giant bladder diverticula are rare and may present with atypical symptoms and diagnostic challenges, particularly on ultrasonography. **Case Presentation:** A 70-year-old female presented with acute onset oliguria, burning micturition, and perineal discomfort. Initial ultrasonography, showed a large echogenic intravesical mass with dense posterior acoustic shadowing, raising differential diagnoses including a stone-filled diverticulum, intraluminal calculi, or a calcified bladder mass. Due to limited characterization on ultrasonography, non-contrast CT KUB was performed, which demonstrated a giant posterolateral urinary bladder diverticulum with a narrow neck, completely filled with multiple densely calcified calculi, with relative decompression of the main bladder lumen. The patient subsequently underwent endoscopic stone removal, confirming the imaging findings. **Conclusion:** This case highlights the diagnostic limitations of ultrasonography in stone-filled bladder diverticula and underscores the pivotal role of CT in definitive diagnosis, anatomical delineation, and surgical planning.

Keywords: Urinary bladder diverticulum; bladder calculi; computed tomography

INTRODUCTION

Urinary bladder diverticula are herniations of the bladder mucosa through the detrusor muscle and may be congenital or acquired, most commonly secondary to chronic bladder outlet obstruction in elderly patients.[1,4,6] Most bladder diverticula are small and asymptomatic; however, giant bladder diverticula are rare and may present with complications such as infection, stone formation, urinary retention, or, rarely, malignancy.[1,2,4,8]

Giant bladder diverticula can pose a diagnostic challenge, particularly on ultrasonography, where stone-filled diverticula may mimic intravesical masses or calcified bladder tumors.[1,3,7] Cross-sectional imaging, particularly computed tomography (CT), plays a pivotal role in accurate diagnosis, anatomical delineation, and surgical planning.[2,4,8]

CASE PRESENTATION

A 70-year-old female presented with acute onset oliguria, burning micturition, and perineal discomfort. There was no history of chronic lower urinary tract symptoms, hematuria, fever, flank pain, or prior urological intervention. Similar atypical presentations without long-standing voiding symptoms have been reported in elderly patients with giant bladder diverticula.[1,2,6,8]

Initial ultrasonography performed prior to referral demonstrated a large echogenic mass-like lesion within the urinary bladder, showing dense posterior acoustic shadowing. A single diverticulum was suspected arising from the superior right posterolateral aspect of the bladder, containing multiple internal echogenic foci suggestive of calculi. The bladder wall appeared thickened; however, the diverticular neck could not be clearly delineated. The precise site of origin and communication with the bladder lumen could not also be



confidently assessed. These findings were inconclusive and raised differential diagnoses including a stone-filled bladder diverticulum, intraluminal stone cluster, or calcified intravesical neoplasm—an acknowledged limitation of ultrasonography in stone-filled diverticula.[1,3,7] Ultrasonography images were not available for review, limiting further characterization—an established limitation in cases of stone-filled bladder diverticula. Given the inconclusive ultrasonographic findings, further evaluation with cross-sectional imaging was advised.

IMAGING FINDINGS

Non-contrast CT KUB demonstrated a large, smooth-walled posterolateral urinary bladder diverticulum communicating with the bladder lumen through a narrow neck. The diverticular sac was completely filled with multiple large, densely calcified calculi. The main bladder lumen appeared relatively decompressed, explaining the patient's acute urinary symptoms.

No intravesical soft-tissue mass, mural irregularity, or perivesical infiltration was identified. The upper urinary tracts were unremarkable. These imaging findings were consistent with previously reported CT appearances of giant stone-filled bladder diverticula.[2,4,5,7] CT allowed confident differentiation from other differential diagnoses such as intravesical stone clusters, calcified bladder neoplasms, and ureterocele, which may appear similar on ultrasonography.[2,4,8]



Axial non-contrast CT KUB showing a large posterolateral urinary bladder diverticulum containing a densely calcified calculus (arrow), with relative decompression of the main bladder lumen.



Coronal reformatted CT image demonstrating a giant bladder diverticulum communicating with the urinary bladder through a narrow neck (arrow).



Multiple bladder calculi retrieved endoscopically, correlating with CT findings.

MANAGEMENT AND OUTCOME

The patient underwent endoscopic removal of multiple bladder stones. Intraoperative findings correlated with the CT diagnosis of a giant bladder diverticulum filled with calculi. Similar endoscopic and surgical management strategies have been reported in previously published cases.[3,5] Post-procedure, the patient experienced symptomatic relief with improvement in urinary output. No evidence of malignancy was identified.

DISCUSSION

Giant bladder diverticula are uncommon entities and are most frequently reported in elderly patients.[1,2,4,6] Stone formation within diverticula occurs due to urinary stasis and recurrent infection.[3,5,7] When a diverticulum is completely filled with calculi, ultrasonography may falsely suggest an intravesical mass, as acoustic shadowing obscures the diverticular neck and limits anatomical assessment.[1,3,7]

CT imaging provides superior spatial resolution, enabling accurate visualization of the diverticular sac, neck, stone burden, and relationship to surrounding structures.[2,4,8] This is crucial not only for definitive diagnosis but also for surgical planning and for excluding associated malignancy, which, although rare, has been reported in bladder diverticula.[1,4]

This case emphasises the role of CT as a problem-solving modality when ultrasonographic findings are equivocal and highlights an unusual acute presentation of a giant bladder diverticulum.

CONCLUSION

Giant urinary bladder diverticulum with multiple calculi is a rare but important diagnostic consideration in elderly patients presenting with atypical urinary symptoms. Ultrasonography may be inconclusive in stone-filled diverticula, and CT is indispensable for definitive diagnosis,

accurate anatomical assessment, and guiding appropriate surgical management.

PATIENT CONSENT

Informed consent was obtained from the patient for publication of this case report and accompanying images.

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