

Giant intradiverticular bladder tumor with narrow diverticular neck

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ABSTRACT

Intradiverticular bladder tumors (IDBT) are rare entities that constitute 1% of all malignancies of the urinary bladder. They present diagnostic and therapeutic challenges. Imaging is crucial in diagnosing this condition. Here we reported a case of a 65-year-old male who presented to our center with severe lower urinary tract symptoms for 9 months, accompanied by weight loss, nausea, vomiting, and an absence of visible hematuria. Clinical examination revealed a palpable suprapubic mass. Laboratory investigations showed low hemoglobin levels, microscopic hematuria, and raised renal function tests. Computed tomography showed a giant bladder diverticulum housing a solid tissue mass. Cystoscopy was challenging due to a narrow diverticular neck. A midline incision was made, and diverticulectomy was performed; histopathological examination revealed high-grade urothelial carcinoma with concurrent right iliac lymph node metastasis. This case highlights the diagnostic challenges of IDBT and emphasizes the importance of a thorough investigation of bladder diverticula to avoid missing intradiverticular malignancy.

Key words: Bladder diverticulum, Bladder tumor, Intradiverticular bladder tumor


Intradiverticular bladder tumors (IDBT) are rare. They make up 1% of all malignancies of the urinary bladder [1]. A precise diagnosis and subsequent staging are essential, with imaging playing a critical role [2]. The urinary bladder mucosa protrudes between muscle bundles in response to elevated intravesical pressure, forming a mucosal extravasation sac or saccule and causing the creation of a diverticulum [1,2]. Because it lacks longitudinal muscle fibers, the region next to the ureteral opening is especially prone to diverticulum formation. In this case, the absence of the supporting muscle layer causes mucosal outpouching, which impairs contractile function and causes urine stasis. This stasis can then result in urinary tract infections (UTIs) and stone formation; accumulation of carcinogens which increases the risk of cancer [3,4]. Computerized tomography-urography and cystoscopy are the most often used diagnostic tools for IDBT [5,6]. A narrow diverticulum neck may render the visualization and hence resection of bladder tumor is difficult [7]. Alternatively, a computed tomography (CT) guided biopsy can be done with the risk of tumor seeding along the needle tract [8,9]. Management options for IDBT follow the general management of bladder cancer patients. The most notable

variations are a higher incidence of invasive malignancies (stage T1 and above), a higher rate of non-urothelial histology, the absence of stage T2 disease due to the lack of a muscularis propria layer, and a possible role for partial cystectomy or diverticulectomy in the course of treatment [10,11]. Additional contemporary therapeutic techniques, such as the use of single- and dual-wavelength diode lasers, are also employed in the management of IDBT [12].

To the best of our knowledge, this is the first case of IDBT to be reported from Sudan.

CASE REPORT

A 65-year-old man arrived at our facility with severe lower urinary tract symptoms persisting for about 9 months. He was notably emaciated, had a history of direct vision internal urethrotomy 15 years ago, and experienced fever, dysuria, nausea, and vomiting. The patient had normal vital signs but looked very sick and pale, even though there was no visible hematuria. In the abdomen, there was a non-tender mass above the pubic area that could be felt, it is about ten by eight centimeters in diameter, with a smooth surface, firm in consistency, and you cannot insinuate your fingers between the mass and the symphysis pubis. There

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was a perineal urethrocutaneous fistula, and a digital rectal examination showed a small, benign-textured prostate.

Laboratory findings included hemoglobin at 7.5 g/dL, total white blood cell count at $17.7 \times 10^3/\text{cm}^3$, serum creatinine at 2.02 mg/dL, blood urea at 172 mg/dL, sodium at 149 mg/dL, and potassium at 3.6 mg/dL. Urinalysis revealed uncountable pus cells and uncountable red blood cells. Because of the patient's symptoms, an ultrasound and CT scan were done. The scans revealed a large bladder diverticulum with a solid tissue mass, mild right hydronephrosis, and other small diverticula (Fig. 1). Cystoscopy showed that the patient had a small prostate that wasn't causing obstruction, two urinary bladder diverticula that produced cloudy urine, and an old urethral stricture that could be passed. However, because of the narrow diverticular neck, intraventricular abnormalities were not visible.

The patient received three units of blood, a size 20 Fr three-way catheter was placed with saline bladder wash, and antibiotics were administered. Following stabilization, a midline infraumbilical incision was made and a large diverticulectomy was performed. The right ureter was excised and re-implanted into the bladder because it was attached to the diverticulum. Along with the specimen, an enlarged single external iliac lymph node was removed and sent for histopathology.

Three days later, the patient was discharged in good health. Histopathology identified high-grade urothelial carcinoma that invades the perivesical tissue microscopically with the right iliac lymph node metastases T3aN1M0 (Fig. 2). The patient was sent to the oncology department for adjuvant therapy. Unfortunately, the patient passed away 6 months following surgery and we could not ascertain the precise cause of mortality. The case summary of the patient is given in Table 1.

DISCUSSION

Of all urological instances, bladder diverticula are an uncommon ailment that makes up only 1.7% of cases. Within these diverticula, the incidence of transitional cell carcinoma (TCC) varies from 0.8% to 13% [4]. The male urinary bladder diverticulum is more prevalent than the female diverticulum. It has been found that around 95% of bladder diverticula cases included males over the age of 50 [6,10,11].

Similar to bladder TCC elsewhere, the primary symptom of patients with IDBT is painless hematuria [6]. In our case, lower urinary tract symptoms were the main presenting complaint, likely attributed to the old urethral stricture and UTI. The risk factors that raise the likelihood of developing bladder TCC are also identical to those that enhance the chance of developing TCC of a bladder diverticulum [3,4]. Bladder diverticula lack a muscular layer and empty the diverticula insufficiently, increasing the risk of urinary tract diseases such as cancer and UTIs [2-4].

Similar to the variety of non-muscle-invasive bladder tumors, diverticular TCCs present challenges in diagnosis, treatment, and follow-up [3,4]. In this case, the narrow diverticular neck made it difficult to see the tumor and, as a result, made obtaining a biopsy by Trans Urethral Resection not feasible. Al-Hajjaj reported in a

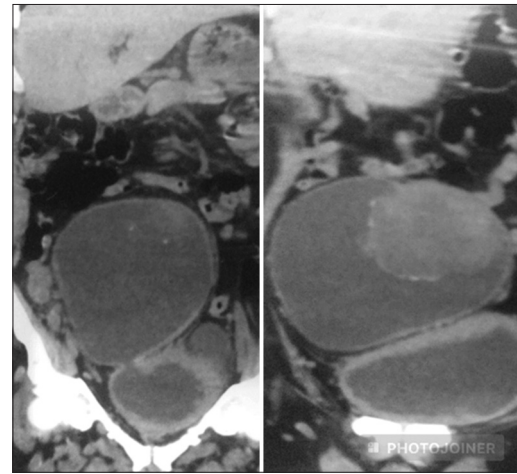


Figure 1: Big ladder diverticulum containing soft tissue mass

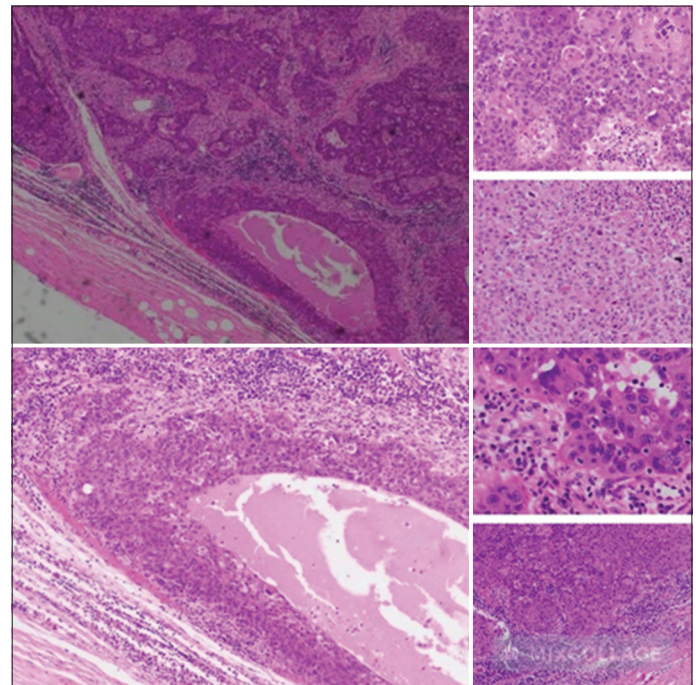


Figure 2: High-grade transitional cell carcinoma and positive lymph node for metastasis

case of IDBC where because of a narrow diverticula neck, he could not visualize and resect the tumor [7]. Potential complications associated with CT-guided biopsy, such as bleeding and tumor seeding along the biopsy tract, may render this approach less favorable compared to surgical exploration. Tract seeding though it is very rare, it was reported in the literature, Gemender *et al.* reported in an unusual case where urinary bladder urothelial cancer cells metastasized to the paravertebral soft tissues through apparent seeding along a nephroureterostomy tract [8]. Biopsy tract seeding is also reported by Gusev *et al.*, who present a documented case of bladder cancer involvement of the omentum and peritoneum along a biopsy tract [9]. The normal therapy for patients with bladder cancer is followed in the case of IDBT [6]. One of the differences is that there is no-stage T2 disease, more invasive cancer, a higher rate of non-urothelial cancer, and a possible role for partial cystectomy or diverticulectomy in the treatment process [7]. Treatment options

Table 1: Summary of clinical, laboratory, radiological, cystoscopy, and surgical intervention Findings of the patient and outcome

Patient information	Findings
Age	65 years
symptoms	Severe lower urinary tract symptoms, fever, dysuria, nausea, and vomiting
Laboratory findings	Hemoglobin:7.5 g/dL/white blood cell count[$17.7 \times 10^3/\text{cm}^3$ serum creatinine]: 2.02 mg/dL/blood urea: 172 mg/dL/Urinalysis: Uncountable RBCs
Abdominal exam	Non-tender mass (10×8 cm), firm, smooth/digital rectal examination small, benign-textured prostate
USS-CT-scan findings	The scans revealed a large bladder diverticulum with a solid tissue mass, mild right hydronephrosis, and other small diverticula
Cystoscopy findings	Urethral Stricture: An old stricture successfully passed Prostate: Small, not obstructive Bladder diverticula: Two diverticula causing cloudy urine Intradiverticular abnormalities: Not visible due to narrow diverticular neck
Surgical intervention	Diverticulectomy: A large diverticulum is excised, the right ureter excised, and re-implanted into the bladder. Lymph node: Enlarged external iliac lymph node removed
Histopathology report	Tumor type: High-grade urothelial carcinoma Invasion: Invaded peri-vesical tissue Lymph node metastases: Right iliac lymph node metastases (T3aN1M0)
Prognostic features	Tumor stage (T3a) Locally advanced; Nodal involvement (N1) Increased risk of recurrence and poor prognosis Metastasis (M0) No distant metastasis was detected at the time of surgery
Outcome	The patient passed away 6 months following surgery; the cause of death was not ascertained.

for a diverticulum bladder (TCC) include radical cystectomy, diverticulectomy, and other mini-access procedures, including laparoscopic diverticulectomy and transurethral resection of bladder tumor, with or without adjuvant intravesical chemotherapy and/or radiation [6,10-12]. In a large study, the most prevalent treatment strategy was diverticulectomy, followed by radical cystectomy [6]. In this case, diverticulectomy was preferred over cystectomy because no pre-operative tissue biopsy was obtained. A midline incision was performed to give good exposure. As of yet, no research has compared the effects of various treatment techniques. This study is constrained by its nature as a case report, hence we cannot generalize the results, but it helps in raising awareness of the diagnostic and therapeutic challenges associated with IDBT. To help patients and doctors make judgments about treatment options and post-operative surveillance techniques, more research on various conservative management strategies, their effects on quality of life, and prognoses would be beneficial.

CONCLUSION

IDBTs are uncommon and might be difficult to diagnose and treat. Because of the narrow neck, which makes it difficult to see the tumor and obtain a biopsy, a pre-operative pathological diagnosis may be challenging. More research comparing various diagnostic and treatment techniques is required to help urologists in outlining the best strategy of management.

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