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Case Report

Multiple Bladder Diverticula Presenting in an 82-Year-Old Congolese Male

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Bladder diverticulum is a congenital malformation characterized by the outpouching of the bladder following an obstruction of urine flux. We present a case of 82-year-old Congolese male patient presented at our facility with a poor urinary stream and lower abdominal pain. A distended abdomen was found on physical examination while the external genitalia were normal. All blood laboratory values were found to be within normal ranges. The patient's urine analysis revealed an uncountable number of white blood cells. Ultrasonography revealed multiple diverticula in the right posterolateral and posterior wall. An ultrasound of the abdomen revealed numerous bladder diverticula in the bladder's left posterolateral and posterior aspects, mild right-sided hydronephrosis, and severe left hydronephrosis with a thinned-out cortex. Both ureters were normal. A computed tomographic (CT) scan of the abdomen confirmed the diagnosis. The patient underwent an open laparotomy which allowed complete ablation of the diverticula followed by bladder wall repair. A one-week course of antibiotics was prescribed, and the patient was discharged fully recovered with no immediate complications. Although bladder diverticula are a congenital malformation, the presence of multiple diverticula suggests that the condition is acquired. In elderly patients, open laparotomy combined with intravenous antibiotics yields positive results.

1. Introduction

Generally defined as a herniation of the mucosa that lacks a muscle layer, bladder diverticulum results in contractility loss and urine stasis in the diverticulum [1–3]. It results from a defect in the bladder muscle development during the embryonic stage. Congenital bladder diverticula have been reported in 1.7 percent of children, with a peak in children under the age of 10 [2–4]. Generally, they are located superolateral to the ureteral orifice, close to the ureterovesical junction [1]. Bladder diverticula are typically discovered during an investigation for lower urinary tract symptoms

(LUTS), hematuria, infection, stone formation, or malignant neoplastic change [5, 6]. We present a case of an 82-year-old adult with multiple bladder diverticula diagnosed at his advanced age.

2. Case Presentation

Over the last year, an 82-year-old Congolese male patient presented with a poor urinary stream and lower abdominal pain. On examination, the patient's abdomen was distended with no noticeable mass. He had a grossly distended bladder extending from the hypogastrium up to the right hypochondrium. The external genitalia were normal. All blood laboratory values were found to be within normal ranges. The patient's urine analysis revealed an uncountable number of white blood cells. Ultrasonography revealed diverticula in the right posterolateral and posterior wall. An ultrasound of the abdomen revealed numerous bladder diverticula in the bladder's left posterolateral and posterior aspects, mild right-sided hydronephrosis, and severe left hydronephrosis with a thinned-out cortex. Both ureters were normal.

A computed tomographic (CT) scan of the abdomen and pelvis revealed a well-distended bladder with a significantly thickened and irregular wall measuring up to 1 cm with the presence of diverticula at its left lower posterior aspect (Figure 1). An International Prostate Symptom Score (IPSS) of 4 was obtained for the evaluation of bladder outlet obstruction, indicating that the symptoms are mild. Cystoscopy revealed a normal urethra with multiple wide-mouthed diverticula arising from the bladder's left posterolateral and posterior walls, but the left ureteric orifice was not visible (Figure 2). Prior to surgery, the urinoculture conducted revealed the presence of *Citrobacter freundii* sensible to meropenem and amikacin. For seven days, an intravenous antibiotic treatment of 1 g of meropenem thrice daily was administered. The patient underwent transvesical diverticulectomy, cystostomy, and abdominal washing drainage (Figure 3). Following a supine position, anesthesia, disinfection, and towel lying, we opened the bladder through the Pfannenstiel abdominal incision into the anterior space of the bladder, turned the diverticulum inside out, peeled off the diverticulum completely, sewed it up, and made a fistula at the same time. Cystotomy revealed that the largest size of the right diverticulum was approximately $22 \times 12 \times 20\,\text{cm}^3$. About 700 mL of clear urine had been collected through the diverticulum's ostium. Following surgery, the patient experienced an 80% improvement in his symptoms while on intravenous antibiotics for one week, he was discharged on oral antibiotics for a total of three weeks. An abdominal ultrasound was performed 48 hours later as a follow-up after the surgery and revealed no evidence of diverticulum. We were unable to perform uroflowmetry due to a technical issue: our sole uroflowmeter being out of order.

3. Discussion

Bladder diverticula are a relatively uncommon clinical entity in both pediatric and adult populations. They are often referred to as "hernias of the bladder mucosa through the muscular fibers of the bladder wall," resulting in a thin-walled structure connected to the bladder lumen [1]. They can be congenital or acquired. Congenital bladder diverticula occur in the absence of obstruction to the bladder outlet, often associated with a smooth-walled bladder with no trabeculations on cystoscopy [1, 3], while acquired bladder diverticula are due to all factors leading to obstruction of the bladder outlet such as swollen prostate (prostate adenoma or adenocarcinoma) or urethral stenosis [3, 4, 7].

They are linked to genetic disorders such as Ehlers-Danlos (type 9) syndrome, Menkes kinky hair syndrome, cutis laxa syndrome (Sotos), and Williams-Beuren syndrome. They require genetic testing to determine the etiology of the disease [2, 4, 8].

Bladder diverticulum diagnosis is in the majority of cases incidental (they can be discovered while the patient is undergoing imaging exams indicated for lower urinary tract symptoms). Their true incidence is unknown but is reported to be 1.7 percent in the pediatric population [2, 9].

Although rarely diagnosed in childhood, congenital bladder diverticulum is discovered incidentally following urinary tract infections [10]. Few cases of antenatal diagnosis have been reported [11, 12]. Generally, due to the asymptomatic evolution of the disease, the diagnosis is made in adulthood. In adults, bladder diverticulum is often revealed by lower urinary tract symptoms following benign prostatic hypertrophy. The diagnosis is easy and can be confirmed by an abdominal ultrasound [6, 13]. To refine the diagnosis, further explorations are often required: urethrocystography and urodynamic screening. The abdominal CT scan is often performed especially when there is a suspicion of an intradiverticular mass or a malignant origin or complication [1, 14, 15].

Bladder diverticulum often evolves towards malignancy. Intradiverticular cancer often develops within the diverticula. The most reported histologic types are urothelial carcinoma and urethral squamous papilloma [7, 15–17].

Diverse therapeutic approaches have been developed for bladder diverticulum management. While open surgery is widely preferred by surgeons for diverse reasons, the laparoscopic and transurethral endoscopic approaches are little by little supplanting it [10, 14, 18].

Actually, the robotic surgery has revolutionized the management of bladder diverticula [19]. The robot-assisted transvesical diverticulectomy is accompanied by some advantages: quick localization of the diverticulum and orifices, direct access to the prostate when simultaneous desobstruction is necessary, and short catheterization time [20, 21].

Open diverticulectomy (intra- or extravesical) is beneficial in the case of concomitant prostatic enlargement, allowing simultaneous treatment of both entities. The extravesical approach is reserved for patients with large diverticula associated with peridiverticular adhesions or inflammation. The laparoscopic approach, which offers the benefits of minimally invasive surgery, may also be used [3, 4, 10, 14, 18]. Endoscopic fulguration offers comparatives and satisfactory results in the management of acquired diverticula larger than 4 cm according to Pacella et al. [22].

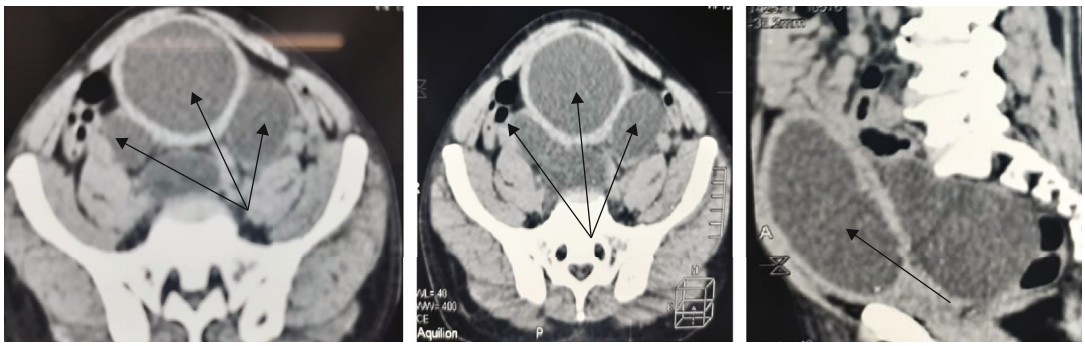

Figure 1: Computed tomographic (CT) scan of the abdomen and pelvis showing multiple bladder diverticula (black arrow).

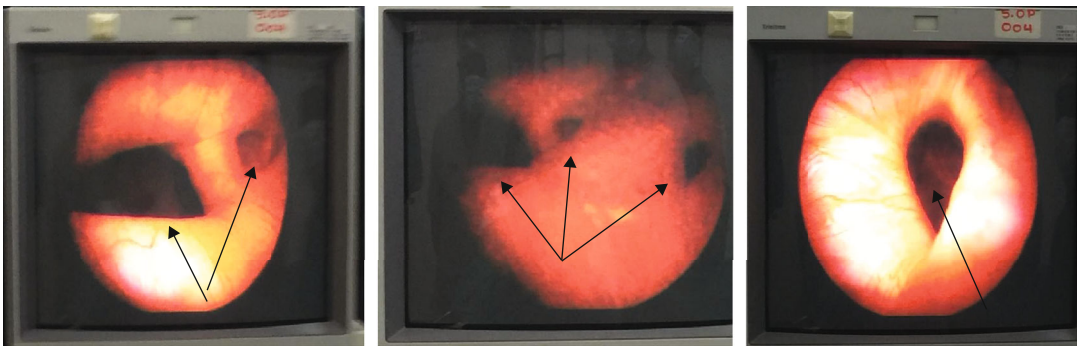

Figure 2: Cystoscopic image of multiple diverticula (black arrow).

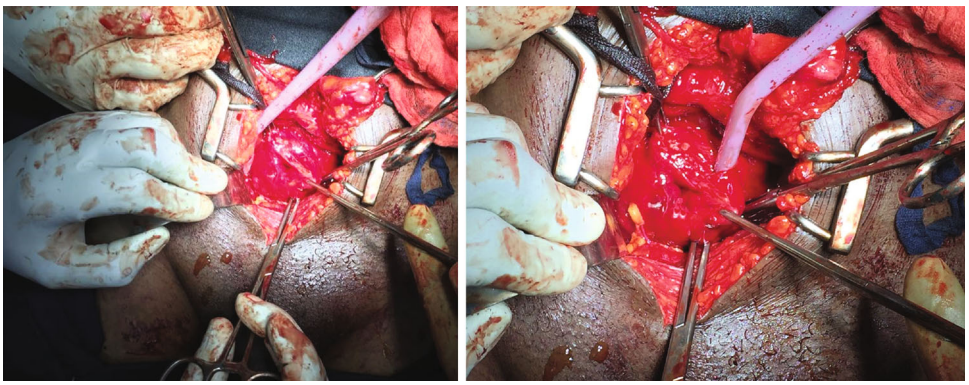

Figure 3: Open surgical repair of multiple bladder diverticula.

4. Conclusion

Multiple bladder diverticula are rare acquired malformations. They are generally associated with urine flow obstruction and often diagnosed incidentally in adulthood following lower tract urinary symptoms. Abdominal ultrasonography coupled with abdominal computed tomography plays a key role in the diagnosis, while open surgery is the best procedure for elder patients.

Data Availability

All materials used in this study are available on request.

Ethical Approval

This case report received ethical clearance from the Ethical Committee of the Catholic University of Bukavu.

Consent

Written informed consent was signed by the patient prior to the publication of this paper.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

JTN and DSN have designed and conceptualized the study and written the first draft. All authors have edited, reviewed, and approved the final manuscript.

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