Bladder diverticulum arising adjacent to an ectopic ureter presenting as a cystic mass

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Acquired bladder diverticula due to bladder outlet obstruction are not uncommon in the adult male population. Congenital diverticula originate adjacent to the trigone and are rarely diagnosed in adults. We report an unusual case of a diverticulum arising adjacent to an ectopic ureter located on the left lateral wall near the dome of the bladder. Although the diverticulum appeared to be congenital, its large size was likely a result of high pressure voiding. The patient underwent a transurethral resection of the prostate to reduce his bladder outlet obstruction, and subsequently underwent an open diverticulectomy.

Key Words: bladder diverticulum, ectopic ureter, renal failure, obstruction

Introduction

Bladder diverticulum may be congenital, iatrogenic, or acquired in origin. While it is not uncommon for adult men to present with acquired diverticula due to infravesical obstruction, to present in adulthood with a true congenital diverticulum is a much less common occurrence. Prophylactic diverticulectomy is rarely recommended if the patient is asymptomatic. However; stone formation, tumor, infection, ureteral obstruction, rupture, and vesioureteral reflux can be indications for surgical treatment.[1] We report a case of a congenital bladder diverticulum arising adjacent to an ectopic ureter implanted high on the left lateral wall of the bladder.

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Case presentation and management

A 61-year-old male was being evaluated for anemia, and as part of this evaluation underwent a barium enema which revealed extrinsic compression of the rectosigmoid colon suggestive of an abdominal mass. The patient was also found to have renal insufficiency with a serum creatinine of 2.2 mg/dl. A computed tomography (CT) scan of the abdomen and pelvis without contrast was obtained to further investigate these findings. This study demonstrated a very large cystic mass which extended from the pelvis superiorly to the level of the liver, Figure 1. The patient also had bilateral, moderate, hydronephrosis. The patient had no other significant past medical or surgical history, but did report a 1 year history of progressively worsening lower urinary tract symptoms including urinary hesitancy and a decreased force of stream. The patient was referred to surgical oncology due to a presumed diagnosis of an abdominal cystic neoplasm. The CT images were more consistent with a bladder diverticulum, however, and the patient was subsequently referred to urology for further evaluation. A foley catheter was first placed, and approximately 4000 cc of clear urine was drained. A cystogram was then performed which demonstrated a massive bladder diverticulum arising high on the left lateral wall of the bladder, and no vesicoureteral reflux. Flexible cystoscopy revealed a moderately trabeculated bladder with the large diverticulum located high on the left lateral wall near the dome. The neck of the diverticulum was approximately 1.5 cm in diameter.

After a period of catheter drainage to allow for improvement of the patient's renal function and resolution of the hydronephrosis, the patient underwent a transurethral resection of the prostate in an attempt to alleviate his high pressure voiding as the source of his lower urinary tract symptoms,

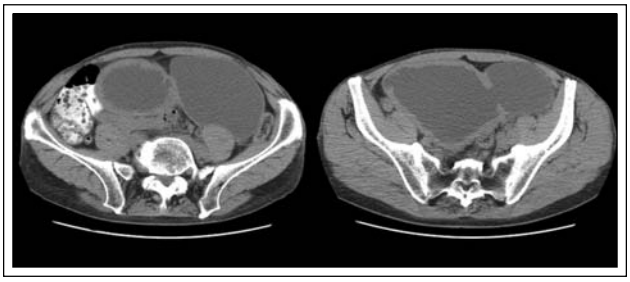

Figure 1. Non-contrast computed tomography scan of the abdomen and pelvis demonstrating the large size and neck of the diverticulum. Also demonstrated is a thickened bladder wall.

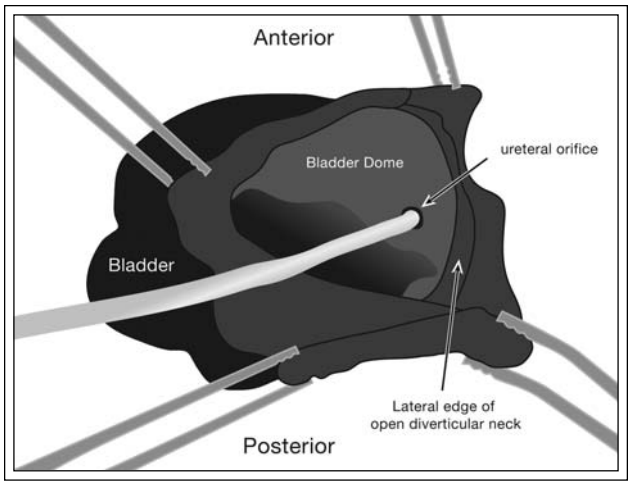

Figure 2. Illustration depicting intraoperative findings including ectopic ureteral orifice location (with stent protruding) after extravesical incision of a large bladder diverticulum originating high on the left lateral wall of the bladder near the dome.

bilateral upper tract dilatation, and renal insufficiency. Intraoperative findings revealed mild lateral lobe hyperplasia and pathology demonstrated only benign tissue. Postoperatively, the patient reported a marked improvement in his lower urinary tract symptoms and his renal function improved.

Although the patient had no history of urinary tract infection or stone formation in the diverticulum, it was thought wise to excise the diverticulum given its large size. An open extravesical diverticulectomy with primary cystorraphy was performed. Intraoperatively it was noted that the left ureter was ectopically located on the superior left lateral bladder wall, Figure 2, approximately 1.5 cm medial to the neck of the diverticulum. Pathology of the diverticulum revealed only benign urothelial changes. The patient's postoperative course was without incident. A renal ultrasound performed 3 months after the diverticulectomy revealed no collecting system dilatation, and his creatinine had improved to 1.2 mg/dl.

Discussion

Bladder diverticula are classified as congenital, acquired, or iatrogenic. Congenital diverticulum usually present during childhood, are usually solitary and do not have associated bladder trabeculation, and are most commonly located lateral and posterior to the ureteral orifice.[2] Acquired diverticula occur most

commonly in the setting of bladder outlet obstruction or neurogenic dysfunction, are usually multiple, can be in any location, and are typically found in association with significant bladder trabeculation.[3]

Primary diverticula arise as a localized herniation of bladder mucosa through the ureteral hiatus between the intravesical ureter and the roof of the ureteral hiatus. While focal defects in Waldeyer's fascia have also been implicated, an estimated 98% of primary bladder diverticuli are located in an anterolateral position to a ureteral orifice,[3] and in some cases the ureteral orifice itself is incorporated into the cavity of the diverticulum.[4]

Once diagnosed, congenital or acquired bladder diverticula may not require further therapy unless they are associated with persistent symptoms, recurrent infections, obstruction, stones, malignant disease, or other complicating factors such as ipsilateral vesicoureteral reflux.[1] Symptoms or complications related to bladder diverticula are most often due to poor emptying of the diverticulum and urinary stasis. Reported treatment modalities range from open diverticulectomy (extravesical or intravesical), endoscopic transurethral resection and fulguration, and laparoscopic diverticulectomy.[5] However, it is paramount to treat the underlying cause of infravesical obstruction prior to diverticulectomy to prevent recurrence of acquired diverticulum.

We report a unique case of a congenital diverticulum arising adjacent to an ectopic ureter, which was located high on the left lateral wall of the bladder near the dome. Renal failure occurred as a result of bladder outlet obstruction. The high pressure voiding secondary to this obstruction was also likely the cause of the massive enlargement of the bladder diverticulum. Although it is not certain, the size and solitary nature of the diverticulum points to a congenital etiology. □

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