UIJ UroToday International Journal®

www.urotodayinternationaljournal.com
Volume 3 - April 2010

Giant Vesical Diverticulum Calculus: A Case Report

Sataa Sallami, Mohamed Mourad Gargouri, Sami Ben Rhouma, Mohamed Hmidi, Yassine Nouira, Ali Horchani
Department of Urology, La Rabta Hospital-University, Tunis, Tunisia
Submitted February 7, 2010 - Accepted for Publication March 3, 2010

ABSTRACT

Vesical diverticula are herniations of the bladder mucosa and submucosa through the muscular wall of the bladder. A massive or giant vesical diverticulum calculus is a rare entity. It is usually secondary to bladder outlet obstruction. The patient typically presents with lower urinary tract symptoms, abdominal distension, or abdominal pain. The present case is a 75-year-old male with a giant vesical diverticulum calculus. The surgeons found 12 cm × 10 cm intradiverticular and 6 cm x 4 cm intravesical stones during laparotomy. They performed a diverticulectomy with stone extraction and primary closure. Six months postoperatively, the patient had no voiding dysfunction. The case is compared with 9 others reported in the literature.

INTRODUCTION

Vesical diverticula are herniations of the bladder mucosa and submucosa through the muscular wall of the bladder. They are often small and asymptomatic; most are discovered incidentally during an examination for other reasons [1].

Most bladder diverticula require no treatment, although some may cause significant morbidity [1]. Complications include recurrent infections (13%-73%), stone formation (5%-16%), tumor development (3.5%-10.8%), ureteral obstruction (8%), and urinary retention [2,3].

The present authors report an unusual case of a large bladder diverticulum calculus. They also summarize a literature review on this topic.

CASE REPORT

A 75-year old male presented with intense lower urinary tract symptoms (LUTS), hypogastric pain, and increased abdominal weight. The symptoms had developed over the past 2 years, but the patient was not bothered by them. He had no history of previous recurrent urinary tract infection, hematuria, urethral catheterization, or trauma.

Evaluation

On examination, the abdomen was soft. A firm, nontender lump was palpable in the hypogastric region. On digital rectal examination, the prostate was small and there were no suspected problems. However, there was a hard laterovesical mass over the anterior rectal wall.

Complete blood count, serum creatinine, electrolytes, and urine culture were normal. Prostate specific antigen (PSA) was 1.9 ng/mL. Peak urinary flow rate was 4 mL/s, and the International Prostate Symptom Score (IPSS) was 31.

A plain radiograph revealed 2 large radiopaque shadows in the pelvis and a third shadow in the left renal area (Figure 1). Abdominal ultrasonography confirmed the presence of large vesical and left renal pelvis calculi. The prostate volume was 43 mL. Intravenous urography (IVU) showed a large radiopaque stone in a bladder diverticulum and a small bladder stone with deviation of the right ureter (Figure 2).

Management

A primary urethrocystoscopy was performed. The cystoscopy did not reveal any urethral stenosis or bladder tumor. However, the prostate was obstructed because of the large bladder stone.

KEYWORDS: Urinary bladder; Vesical diverticulum; Stone; Diverticulectomy
CORRESPONDENCE: Dr. Sataa Sallami, Department of Urology La Rabta Hospital-University, Tunis 1007, Tunisia (sataa_sallami@yahoo.fr).
CITATION: *UroToday Int J*. 2010 Apr;3(2). doi:10.3834/uij.1944-5784.2010.04.13

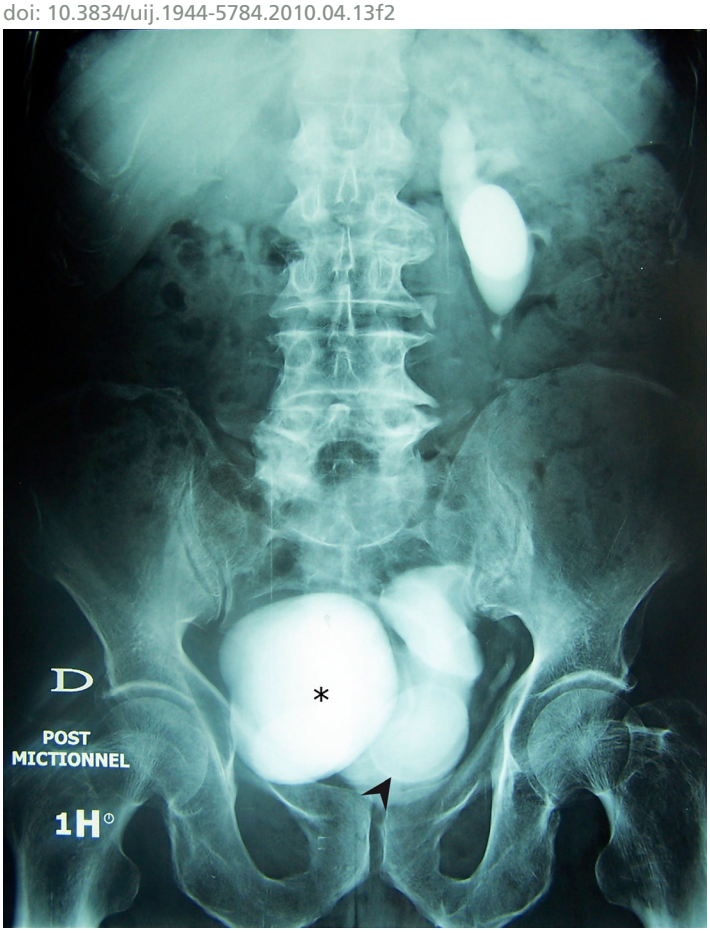
Abbreviations and Acronyms
IVU = intravenous urography
LUTS = lower urinary tract symptoms

UIJ UroToday International Journal®
case report

Giant Vesical Diverticulum Calculus: A Case Report

Figure 1. Plain Radiograph of the Pelvis Showing a Large Radiopaque Shadow of the Left Renal Area and 2 Giant Spherical Vesical Stones.
doi: 10.3834/uij.1944-5784.2010.04.13f1

Figure 2. Intravenous Urography Showing Large Radiopaque Stones in the Left Renal Pelvis, a Large Bladder Diverticulum (asterisk) and the Bladder (arrow).
doi: 10.3834/uij.1944-5784.2010.04.13f2



The diverticular orifice was approximately 2 cm in diameter and was located in the posterosuperior region of the bladder. A yellowish-gray hard calculus was seen, with fine spicules occupying the entire cavity of the bladder diverticulum. An endoscopic resection of the prostate was completed because of its small volume.

The diverticulum was observed during laparotomy. It originated from the right posterosuperior region of the bladder. The surgeons found 2 stones: a 12 cm × 10 cm intradiverticular stone and a 6 cm x 4 cm intravesical stone.

An open diverticulectomy was performed because of the stone size. The diverticulum was dissected without any difficulty using an extraperitoneal approach and primary closure. The bladder stone was extracted.

A suprapubic cystostomy was performed for more security and the bladder was catheterized with a transurethral catheter.

Postsurgical Follow-up

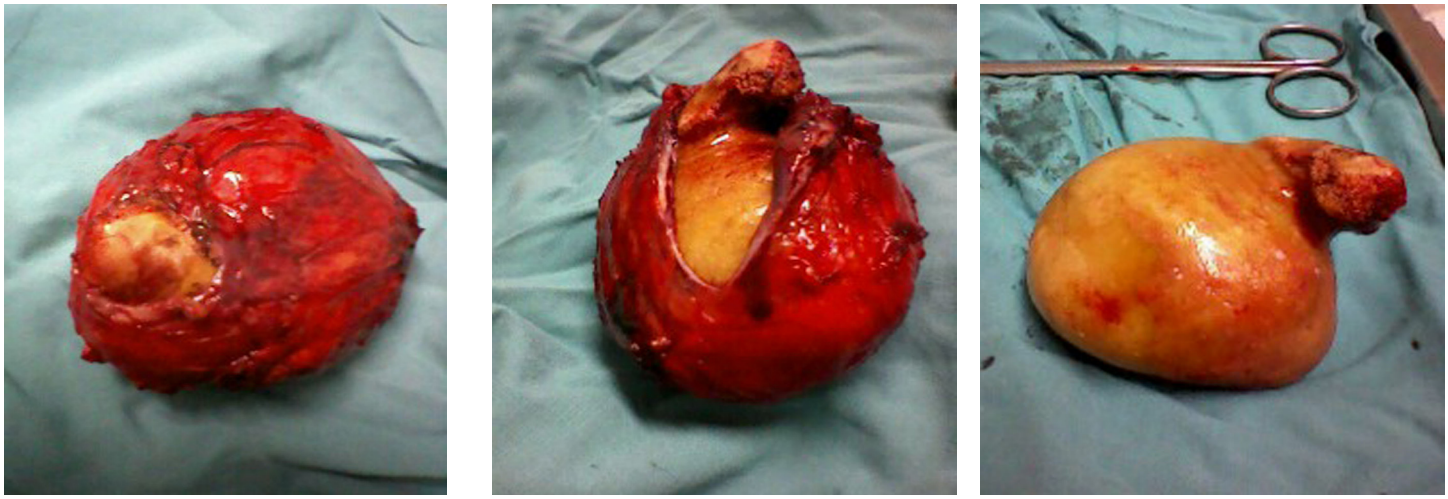
The intradiverticular stone weighed 310 g (Figure 3). Chemical analysis revealed a mixed type.

The transurethral catheter was removed on the 4th day after surgery. The patient was discharged the next day. The suprapubic catheter was clamped on the 10th postoperative day, and the patient had no difficulty passing urine through the urethra. Therefore, this catheter was removed. Two months later, the left renal pelvic stone was removed by open surgery.

Six months postoperatively, the patient was asymptomatic and had no pain or difficulty in voiding. An abdominal ultrasound showed no significant postvoid residual.

UroToday International Journal®
case report
Sataa Sallami, Mohamed Mourad Gargouri, Sami Ben Rhouma, Mohamed Hmidi, Yassine Nouira, Ali Horchani
www.urotodayinternationaljournal.com

Figure 3. Postoperative Views of the Stone Taken From the Bladder Diverticulum.
doi: 10.3834/uij.1944-5784.2010.04.13f3



DISCUSSION

The present case was unusual because of the size of the bladder diverticulum and accompanying stone formation. The patient presented with LUTS and abdominal weight gain. Shaked et al [4] presented a similar case of bladder distention and giant diverticulum arising from obstruction caused by a prostate adenoma. Diverticula generally develop from the ureteral orifices in the bladder. However, in the present case the diverticulum was located in the posterosuperior region of the bladder, distant from the ureteral orifices [5].

Giant calculi are thought to develop from the nidus of the infected material, with progressive layering of the calcified matrix. Lewi et al [6] reported formation of a large vesical calculus that resulted from the coalescence of 2 or more calculi. The typical composition of the vesical calculus is a mixture of triple phosphate, calcium carbonate, and calcium oxalate (as in the present case).

Diagnostic evaluation should include blood and urine tests as well as ultrasound, cystourethrography, IVU, and cystoscopy. Facultative urodynamic studies and computed tomography can also be performed [7].

Table 1 contains a summary of the medical history, symptoms and signs, diagnostic tests, and management procedures for 9 previously reported cases of *giant bladder diverticulum* plus the present case. The cases were reported in the literature between 1979 and 2009 [2,4,8-12]. None of the cases except the present were complicated by a giant stone.

Indications for surgery are persistent or recurrent urinary infection, the presence of a stone or tumor in the diverticulum [13,14], lower urinary tract symptoms, and voiding symptoms or vesicoureteral reflux [15] resulting from the diverticulum, the stone, or ureteral obstruction [9]. Therapy includes either transurethral or open surgery. Infravesical obstruction should be treated first or combined with diverticulum therapy. Management includes transurethral resection of a small prostate and incision of a small diverticulum, or open prostate enucleation and diverticulectomy for a large prostate and diverticulum [6].

Open surgery has been recommended most frequently for large stones [16]. For small or moderate calculi, endosurgical procedures such as optical mechanical cystolithotripsy have an added advantage because they can be combined with correction of bladder outlet obstruction [17]. Zhaowu et al [18] recommended that extracorporeal shockwave lithotripsy (ESWL) should be avoided if the stone is in the diverculum or stuck to the mucosa. In the present case, the small prostate was treated by endoscopic resection. Laparotomy was indicated because of the presence of the giant diverticulum and vesical stones.

CONCLUSION

A giant vesical diverticulum calculus is very rare and almost always secondary to bladder outlet obstruction. Treatment is mandatory and consists of diverticulectomy, stone extraction, and management of the cause of bladder obstruction.

Table 1. Medical History, Symptoms and Signs, Diagnostic Tests, and Management Procedures for 9 Cases of Giant Vesical Diverticula Reported in the International Medical Literature. doi: 10.3834/uij.1944-5784.2010.04.13t1

Author, year [reference]	Age (years)	Sex	Medical History	Initial Symptoms or Signs	Diagnostic Tests	Management
Shukla et al, 1979 [9]	11	F	EDS	Infection; Incomplete voiding	Cystogram	Diverticulectomy
	4 mo	M	No history of voiding dysfunction	Urinary retention		
	3	M				
Farhi et al, 1991 [11]	31	F	Ovarian cyst	Recurrent urinary infections	Ultrasonography; Cystogram	
Burrows et al, 1998 [10]	16	M	EDS type 1	Outflow obstruction	Cystogram	Diverticulectomy
Suzuki, et al 2002 [2]	84	M	Bladder injury from bullet	Abdominal distension	CT; Cystogram	Diverticulectomy
Siddiqui et al, 2003 [12]	77	M	Endoscopic resection of the prostate	Acute urinary retention	IVU	Diverticulectomy
Mirow et al, 2007 [8]	84	M	Sigmoid carcinoma	Abdominal pain; Intestinal obstruction	Intraoperative	Diverticulectomy
Shaked, et al 2009 [4]	76	M	Hypertension; Diabetes Mellitus	Abdominal pain; Constipation	CT	
Sallami, et al [present study]	75	M	No history of voiding dysfunction	LUTS	IVU	Diverticulectomy

Abbreviations: CT, Computed tomography; EDS, Ehlers-Danlos syndrome; IVU, Intravenous urography; LUTS, Lower urinary tract symptoms.

REFERENCES

[1] Melekos MD, Asbach HW, Barbalias GA. Vesical diverticula: etiology, diagnosis, tumorigenesis, and treatment. Analysis of 74 cases. *Urology*. 1987;30(5):453-457.

[2] Suzuki K, Tanaka O, Saito T, Tokue A. Giant bladder diverticulum due to previous bullet injury: findings of gadolinium-enhanced magnetic resonance imaging. *Int J Urol*. 2002;9(9):517-519.

[3] Sarihan H, Abes M. Congenital bladder diverticula in infants. *Eur Urol*. 1998;33(1):101-103.

[4] Shaked G, Czeiger D. Distended urinary bladder and diverticulum-a rare cause of large-bowel obstruction. *Am J Surg*. 2009;197(2):e23-e24.

[5] Akbulut S, Cakabay B, Sezgin A, Isen K, Senol A. Giant vesical diverticulum: a rare cause of defecation disturbance. *World J Gastroenterol*. 2009;15(31):3957-3959.

[6] Lewi HJ, White A, Abel BJ, Hutchinson AG. Fused vesical calculi. *Urology*. 1987;30(3): 267-268.

[7] Doehn C, Baumgärtel M, Fornara P, Jocham D. The largest bladder diverticulum ever? *J Urol*. 1999;162(3 Pt 1):793-794.

[8] Mirow L, Brügge A, Fischer F, et al. Giant bladder diverticulum as a rare cause of intestinal obstruction: report of a case. *Surg Today*. 2007;37(8):702-703.

[9] Shukla AR, Bellah RA, Canning DA, Carr MC, Snyder HM, Zderic SA. Giant bladder diverticula causing bladder outlet obstruction in children. *J Urol*. 2004;172(5 Pt 1):1977-1979.

[10] Burrows NP, Monk BE, Harrison JB, Pope FM. Giant bladder diverticulum in Ehlers-Danlos syndrome type I causing outflow obstruction. *Clin Exp Dermatol*. 1998;23(3):109-112.

[11] Farhi J, Dicker D, Goldman JA. Giant diverticulum of the bladder simulating ovarian cyst. *Int J Gynaecol Obstet*. 1991;36(1):55-57.

[12] Siddiqui K, Bredin HC. Giant bladder diverticulum causing recurring urinary retention. *Ir Med J*. 2003;96(8):247.

[13] Corbett HJ, Talwalker A, Shabani A, Dickson AP. Congenital diverticulum of the bladder mimicking tumour. *J Pediatr Urol.* 2007;3(4):323-325.

[14] Shigehara K, Taya T, Hisazumi H. Primary adenocarcinoma in the bladder diverticulum. *Scand J Urol Nephrol.* 2008;42(5):481-483.

[15] Afshar K, Malek R, Bakhshi M, et al. Should the presence of congenital para-ureteral diverticulum affect the management of vesicoureteral reflux? *J Urol*. 2005;174(4 Pt 2):1590-1593.

[16] Maheshwari PN, Oswal AT, Bansal M. Percutaneous cystolithotomy for vesical calculi: a better approach. *Tech Urol.* 1999;5(1):40-42.

[17] Asci R, Aybek Z, Sarikaya S, Buyukalpelli R, Yilmaz AF. The management of vesical calculi with combined optical mechanical cystolithotripsy and transurethral prostatectomy: is it safe and effective? *BJU Int.* 1999;84(1):32-36.

[18] Zhaowu Z, Xiwen, Fenling Z. Experience with electrohydraulic shockwave lithotripsy in the treatment of vesical calculi. *Br J Urol.* 1988;61(6):498-499.