Giant bladder diverticulum: A case report and review of the literature

Abstract

Giant bladder diverticulum may present with different symptoms. Although minimally invasive techniques (endoscopic, laparoscopic and robot-assisted) can be applied effectively, open surgical treatment is still a valid option.

Keywords

Bladder diverticulum; Giant diverticulum; Open diverticulectomy

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Giant bladder diverticulum

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Case Report
Introduction
Bladder diverticulum is defined as herniation of the bladder mucosa from a weak part of the muscularis propria layer in the bladder wall. Its incidence is approximately 1.7% and 1-6% in children and adults, respectively [1].

Case Report
A 73-year-old male patient presented to our outpatient clinic with long-lasting severe lower urinary tract symptoms (LUTS) and abdominal distention. Of the LUTS, storage symptoms were prominent. Although he had undergone internal urethrotomy for urethral stenosis 20 years ago and had been receiving alpha-blocker treatment for eight years, his complaints persisted. On physical examination, there was a palpable swelling in the abdomen extending from the pubic symphysis to the epigastrium and was consistent with the globe vesicle (Figure 1). Urethral foley was inserted and 2000 cc of urine was drained. Renal function tests were normal. Abdominal ultrasonography revealed a giant cystic lesion extending from pelvic region to epigastrium. Upon this, an abdominopelvic computed tomography (CT) was performed and it showed a 17x13x10 cm size diverticulum, filling the left half of the pelvis almost completely, extending to the level of the L3 vertebra, compressing the bladder and prostate to the right, and attaching to the left lateral wall of the bladder with an approximately 15 mm ostium (Figures 2A and 2B). Then, transurethral prostate resection and open diverticulectomy operation was made and applied (Figure 3).

Together with our case, we summarized 18 cases of giant bladder diverticulum detected in adult patients in the literature since 1957 (Table 1).

Discussion
Bladder diverticulum is basically divided into two classes as congenital and acquired. It can also be seen as iatrogenic [2]. Congenital diverticulum usually occurs at the ureterovesical junction or among the hypertrophic muscle bundles where the muscle tissue is poor in amount. They are usually asymptomatic and incidentally detected. [3]. These diverticulae are seen to peak during childhood, especially before the age of 10 years. This presentation can also be seen in elderly patients. Indeed, in an 83-year-old case published by Oliveira et al. in 2017, the patient was diagnosed with bilateral hydronephrosis secondary to urinary retention and acute renal failure [4]. The imaging and physical examination findings of our case were also consistent with urinary obstruction in the form of a vesical globe. Congenital diverticulae are usually seen in males, are solitary and larger than acquired ones. It is mostly localized to the posterolateral of the ureteric orifice. Acquired diverticula are often secondary to a bladder outlet obstruction or neurogenic vesicourethral dysfunction. It is frequently seen in men over 60 years of age and secondary to prostate enlargement by aging. They are mostly multiple and typically associated with marked bladder trabeculation [2]. Our case is also male as 16 of the 18 cases that we reviewed from the literature (Table 1).

The acquired type is usually narrow-mouthed and is more prone

Table 1. Summary of 18 adult giant bladder diverticulum cases in the literature

| Reference          | Year | Age | Gender | Additional disease                  | Application Complaint                  | Diagnosis                       | Size           | Treatment                                |
|--------------------|------|-----|--------|-------------------------------------|----------------------------------------|----------------------------------|----------------|------------------------------------------|
| Kaufman et al (3)  | 1957 | 70  | M      | Unspecified                         | Constipation                           | Plain X-ray, intravenous urography | 17x13x13 cm    | Diverticulectomy                         |
| Taha et al (3)     | 1987 | 65  | M      | Abdominal distention, low urine flow| intravenous urography, CT              | Unspecified                     | 10 cm          | Reduction Cystoplasty                    |
| Farti et al (3)    | 1991 | 31  | K      | Recurrent Urinary Infection         | Ovarian cyst                           | USG, cystogram                  | Unspecified    | Unspecified                              |
| Adachi et al (10)  | 1992 | 25  | M      | Dysuria, intermittent urination     | USG, intravenous urography             | Unspecified                     | Transurethral fulguration of the diverticulum |
| Hsu et al (12)     | 2002 | 84  | M      | Abdominal distention, CT            | CT, cystogram                          | Unspecified                     | Intravesical diverticulectomy            |
| Siddiqui et al (3) | 2003 | 77  | M      | TUR-P was applied twice due to urinary retention | Intravenous urography | Unspecified | Diverticulectomy                        |
| Mirow et al (3)    | 2007 | 84  | M      | Sigmoid colon cancer                | Abdominal pain, intestinal obstruction | Intraoperative                   | Unspecified | Diverticulectomy                         |
| Akbulut et al (3)  | 2009 | 76  | M      | Hypertension, Diabetes Mellitus     | Abdominal pain, constipation, CT       | CT                              | Unspecified | Unspecified                              |
| Lu et al (11)      | 2010 | 87  | M      | Laparotomy due to a traffic accident four years ago | Abdominal distension, pain, constipation, vomiting | Intravenous urography, CT | 20 x 15 cm | Diverticulectomy                        |
| Hsu et al (12)     | 2011 | 73  | M      | No                                 | Dysuria, nocturia                       | USG, CT                         | 15 cm          | Follow-up                                |
| Tortoeli et al (13)| 2011 | 73  | M      | Left donor nephrectomy              | Abdominal distention, left leg pain     | USG, CT                         | 10x9x9 cm      | TUR + Open diverticulectomy             |
| Kaneko et al (8)   | 2012 | 75  | M      | Hypertension, Hyperuricemia         | Syncope                                | USG, CT                         | 11x10x8 cm     | TURP + Diverticulectum                  |
| Kumar et al (6)    | 2014 | 74  | M      | Unspecified                         | Epigastic pain, dyspepsia, LUTS         | USG, cystogram, CT              | 27x21 cm       | Open prostatectomy + Diverticulectomy   |
| Chang et al (2)    | 2015 | 41  | M      | Diabetes Mellitus, Mental retardation, Cerebral Palmy | Abdominal distention                  | CT                              | Unspecified | Diverticulum cauterization + Urinary diversion + Suprapubic cystostomy |
| Braga et al (14)   | 2016 | 63  | K      | Unspecified                         | Abdominal distension, tension          | USG, Intraoperative, CT         | 8 cm           | Unspecified | Diverticulectomy                        |
| Oliveira et al (4) | 2017 | 83  | M      | TUR-P three months ago              | Acute urinary retention                | USG                              | Unspecified | Diverticulectomy                         |

USG: Ultrasonography; CT: computed tomography; TURP: Transurethral prostate resection
Giant bladder diverticulum

Figure 1. Palpable swelling in the abdomen extending from the pubic symphysis to the epigastrium

Figure 2A. Sagittal section of abdominopelvic CT image showing 17x13x10 cm size giant bladder diverticulum

Figure 2B. Axial section of abdominopelvic CT image showing giant bladder diverticulum (D), bladder (B) and ostium (black arrow) forming the passage between two compartments

Figure 3. Diverticulectomy material
Giant bladder diverticulum

of stones or tumors in the diverticulum, vesicocutaneous fistula, Indications for surgical treatment of bladder diverticula are They chose intravesical approach [9]. performed extravesical diverticulectomy except Kwan et al. had reduction cystoplasty. One patient was followed up and performed in our case. Of the 18 cases reviewed, 9 had open diverticulectomy, 3 had endoscopic treatment, and 1 open prostatectomy and who have a diverticular drainage disorder. Combined transvesical diverticulectomy can be performed in the same session in cases with large prostate and obstruction. Combined intravesical / extravesical approach should be preferred in cases with large diverticulum, peridiverticular inflammation and/or coexistence of ureteral pseudodiverticula [2]. Transurethral resection of the prostate and open diverticulectomy was performed in our case. Of the 18 cases reviewed, 9 had open diverticulectomy, 3 had endoscopic treatment, and 1 had reduction cystoplasty. One patient was followed up and treatment methods of 4 patients were unspecified. All authors performed extravesical diverticulectomy except Kwan et al. They chose intravesical approach [9]. Indications for surgical treatment of bladder diverticula are persistent and recurrent urinary tract infections, the presence of stones or tumors in the diverticulum, vesicocutaneous fistula, LUTS, and the presence of vesicoureteral reflux [2]. In our case, the indication for surgical treatment was severe LUTS with storage symptoms at the forefront. Consequently, giant bladder diverticula may present with different symptoms. Endoscopic treatment can be applied effectively and open surgery is still a valid option.

Scientific Responsibility Statement
The authors declare that they are responsible for the article’s scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement
All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Conflict of interest
None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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