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An atypical bladder diverticulum presented with recurrent peritonitis: case report

Tekrarlayan peritonitle bulgu veren atipik mesane divertikülü: Olgu sunumu

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Bladder diverticula develop from congenital detrusor muscle defect and frequently present with urinary tract infection, which occurs as a result of urinary stasis in the diverticula. Different clinical presentations, such as bladder outlet obstruction, cyanosis of the lower extremities, intestinal obstruction, ureteral obstruction (which may occur due to direct diverticular compression), and peritonitis due to spontaneous rupture of the diverticula, were reported previously. Here, we report a case with the diagnosis of bladder diverticulum that caused recurrent generalized peritonitis without perforation and mimicked perforated appendicitis.

Key Words: Bladder; child; diverticulum; peritonitis.

Mesane divertikülleri detrusor kasının doğuştan zayıflığından kaynaklanır. Sıklıkla divertikül içindeki üriner staz sunucu gelişen idrar yolları enfeksiyonu ile kendini gösterir. Mesane çıkım tıkanıklığı, alt ekstremitede siyanoz, intestinal tıkanıklık, üreteral tıkanıklık gibi divertikülün doğrudan basısı sonucu ve divertikülün kendiliğinden rüptüre sonucu gelişen peritonit gibi farklı klinik tablolara neden olabilmektedir. Bu yazıda, perfore apandisiti taklit eden ve perforasyon olmadan tekrarlayan jeneralize peritonite neden olan mesane divertikülü olan bir olgu sunuldu.

Anahtar Sözcükler: Mesane; çocuk; divertikül; peritonit.

Bladder diverticula, described as protrusions of the mucosa, are generally classified into two groups as primary (congenital) and secondary (acquired). Primary diverticula develop as a result of congenital weakness of Waldeyer's facial sheath, without bladder outlet disorder, whereas secondary diverticula usually occur as a result of neurogenic bladder or infravesical obstructions, such as in the posterior urethral valve. [1-3] Stage et al.[4] described iatrogenic diverticula that occur as a result of ureteral reimplantation, suprapubic cystostomy, or after closure of the rectovesical fistula as a third group. The most frequent clinical presentation of vesical diverticula is urinary tract infection. [1,3,5] Secondary peritonitis due to spontaneous rupture of diverticula has been reported.[6,7]

Herein, we present a case with the diagnosis of generalized peritonitis secondary to atypical bladder diverticulum without perforation who underwent two emergency laparotomies.

CASE REPORT

An 11-year-old girl was referred to our department with the diagnosis of a bladder diverticulum. Prior to this referral, she had been admitted to a local hospital due to complaints of abdominal pain, bilious vomiting and fever. She had undergone surgery with the preoperative diagnosis of perforated appendicitis six years earlier; however, the appendix was observed to be normal and there was generalized peritonitis with abundant pus. The source of peritonitis was not found. Peritoneal fluid culture revealed *Escherichia coli*. The diagnosis was accepted as primary peritonitis. On the fourth postoperative day, she underwent relaparotomy with the diagnosis of an adhesive ileus. On the 11th postoperative day, she was discharged.

After five asymptomatic years, she again presented to the same hospital with abdominal pain. Physical examination revealed evident abdominal distention and

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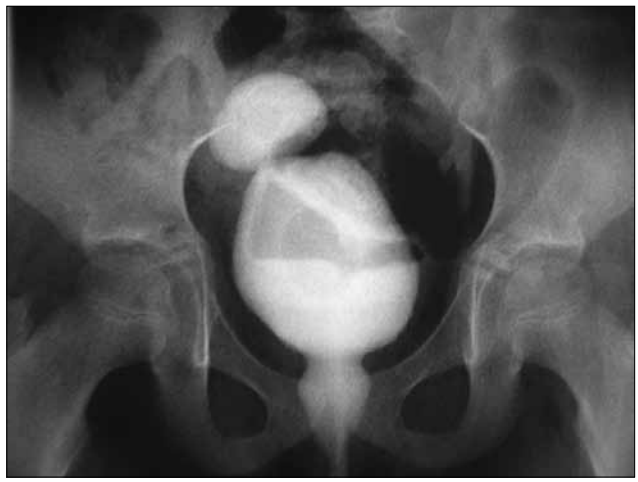

Fig. 1. Voiding cystourethrogram shows a large bladder diverticulum.

generalized tenderness. She had leukocytosis and air fluid level on abdominal X-ray. Ultrasonography revealed an edematous intestinal wall and generalized abdominal free fluid. She underwent a third laparotomy with the preoperative diagnosis of acute abdominal syndrome. Generalized peritonitis with abundant pus was observed. A cystic mass located superior to the bladder was seen. The cyst was opened and a large quantity of pus was drained. Because communication between the cyst and bladder was noted, the cyst was closed. The patient was discharged on the ninth postoperative day. One month later she was referred to our department with the diagnosis of a bladder diverticulum.

Voiding cystourethrography revealed a 4x6 cm diverticulum located on the right side, superior and lateral to the bladder (Fig. 1). There was no evidence of vesicoureteral reflux. Infravesical obstruction was not observed on cystourethroscopy. Ureteral orifices appeared normal. A diverticular orifice was observed quite distant from the right ureteral orifice, with a narrow pedicle (Fig. 2). Diverticulectomy was performed with an extravesical approach via a Pfannenstiel incision. The diverticulum had a thick wall, and histopathological examination revealed a thick muscle layer (Fig. 3). The patient was discharged on the seventh postoperative day. During eight months of follow-up she has remained symptom-free.

DISCUSSION

Congenital bladder diverticula that develop from a congenital detrusor muscle defect are usually solitary and located on the posterolateral bladder wall, close to the ureteral orifice.[1-3] They may also be associated with vesicoureteral reflux.[3,4,8] Although male predominance was noted in most reports, Blane et al. reported that 59% of primary diverticula were in girls.[1,3,4,8,9] The most common symptom is urinary tract infection, which occurs as a result of urinary stasis in the diverticula.[1,3,5] Urinary stasis develops due to a lack of or an inadequate quantity of muscle on the diverticular wall that provides urinary flow. A narrow pedicle of the diverticulum is another factor affecting urinary stasis, as in the presented case. Additionally, hematuria and vesicoureteral reflux are common clinical presentations.[3,4] Less common clinical presentations, such as urinary retention (bladder outlet obstruction), intestinal obstruction and ureteral obstruction, may occur due to direct diverticular compression; however, ureteral obstruction may develop due to the inflammation secondary to diverticulitis.[2,5,9,10] Peritonitis due to spontaneous rupture of diverticula has been reported.[7] This clinical presentation is associated, in particular, with Ehlers-Danlos syndrome. Perforations of the diverticula were related to friability of the tissues in Ehlers-Danlos syndrome and increased intraluminal pressure due to diverticular neck edema, which occurs due to diverticulitis.[6,7] Primary bacterial peritonitis is defined as infection of the peritoneum without gastrointestinal visceral perforation or an etiologic source.

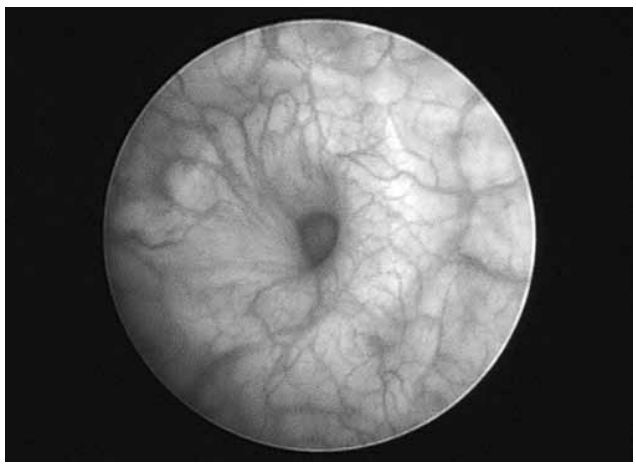

Fig. 2. A narrow diverticular orifice observed with cystourethroscopy.

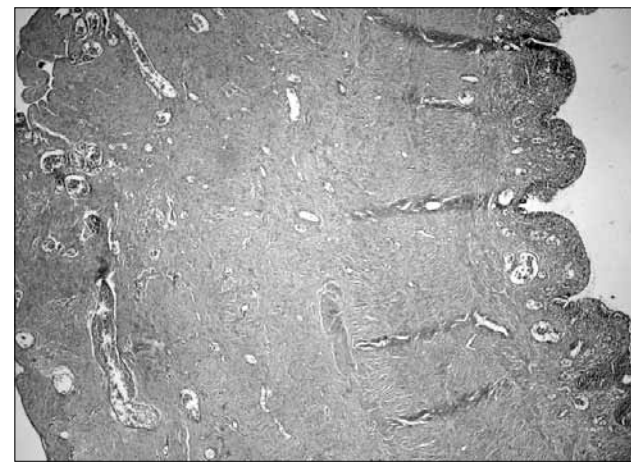

Fig. 3. Thick muscle layer of the bladder diverticulum was observed histopathologically (H-E x 125).

It is more common in girls and accounts for 1%-2% of pediatric abdominal emergencies.[11] As in the presented case, the most common isolated microorganism is *E. coli*.[11] Peritonitis in the presented case may have developed secondary to diverticulitis, without macroscopic perforation. This condition suggests that the infected diverticulum may have caused peritonitis via translocation of the microorganisms or microperforation of the diverticulum. Histologic appearance of the diverticula consists of mucosa, peridiverticular connective tissue and a few smooth muscle fibers in some cases. These muscle fibers are usually of inadequate quantity to empty the urine from the diverticula.[1,2] In contrast to the typical presentation, in the presented case, the muscle layer was thick and the diverticulum was located close to the dome of the bladder. Our patient did not have any complaints during the period between the two acute abdominal attacks, which might have been due to the location and histological characteristics of the diverticulum. We think that the location and the thick muscle layer allowed free urinary flow from the diverticulum in the interim between her two acute abdominal attacks. Nonetheless, a narrow diverticular pedicle may prevent urinary flow into the bladder and cause attacks of diverticulitis.

We recommend investigating the urinary system in detail in patients who undergo laparotomy with the diagnosis of primary peritonitis in order to prevent misdiagnosis and unnecessary interventions and reduce morbidity and mortality rates. In conclusion, bladder diverticula should be considered as a cause of generalized peritonitis.

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