

Case Report

Giant Vesical Calculus Complicating Ileocystoplasty in young Libyan Female: Case Report and Brief Review of Literature

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ABSTRACT

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Though the number of patients with giant Vesical calculi has decreased over recent years owing to wider availability of health care and better diagnostic modalities. They are still encountered in urologic practice. The so-called Giant Vesical calculus is defined as a calculus heavier than 100 grams (g) or measuring more than 4 centimeters (cm) in its largest diameter. Vesical calculi occur rarely in women compared to men. Vesical calculi in women generally occur secondary to passage of suture material through the bladder following pelvic or gynecological surgeries. Herein, we present this rare interesting case on a 17years old female Libyan patient who presented 10 years after Ileocystoplasty for care of neurogenic bladder secondary to myelomeningocele with lower urinary tract symptoms, Supra-pubic pain and fullness and one episode of gross hematuria. Her workup revealed a giant Vesical calculus (10*9*5.5) centimeters and an open cystolithotomy was performed, and a giant whitish pale hard Vesical solitary calculus weighing 284 grams was removed. She passed an uneventful post-operative course and was scheduled for regular follow-up visits.

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INTRODUCTION

Vesical calculi are an old well-known mankind disease. It is a problem of the male and is more common in children of underdeveloped countries and old aged men in industrialized countries [1]. Urinary bladder calculi comprise approximately 5% of all cases of urolithiasis [2]. A urinary bladder calculus more than 100 grams in weight is classically labeled as a giant Vesical calculus. Fewer than 100 cases have been reported in the literature with weight more than 100 grams and almost all of them had bladder outlet obstruction [3]. Stone formation in augmentation cystoplasty is one of the late but common complications. The literature reported incidence of bladder calculi after augmentation cystoplasty varies between 10 and 52% [4,5]. In the post augmented bladder with a Mitrofanof procedure, if patients do not comply with regular self-intermittent catheterization, there is stagnation of urine and formation of the stone [6]. We report a case of a bladder stone weighing 284 gm. that presented ten years following augmentation Ileocystoplasty with the Mitrofanof procedure. To the best of our knowledge, this is the first case of giant Vesical

calculus complicating augmentation cystoplasty reported in our department.

CASE SCENARIO

Our patient is a 17-year-old Libyan young female. She underwent augmentation Ileocystoplasty with cutaneous diversion by Mitrofanof principle for neurogenic bladder (small capacity bladder) secondary to myelomeningocele ten years ago. Patient was on clean intermittent catheterization (CIC) every four hours since then; she presented with the complaint of lower urinary tract symptoms, supra-pubic pain and fullness and one episode of gross hematuria of one-year duration. On general physical examination, the patient was conscious, oriented and not in pain, but there was a mild pallor (2+) and mild dehydration. Her vital signs were stable. Abdominal examination revealed the midline infra-umbilical incision scar of previous Ileocystoplasty which was healed by primary intention, and there is tenderness and palpable hard mobile mass in the Suprapubic region.

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Her baseline investigations showed Hemoglobin 9.7g/dl and total leukocyte count $14.3 \times 10^9/L$. Renal function profile and electrolytes were within normal limits. Routine urine analysis showed alkaline PH, 2+ albuminuria, 3+ RBCs and 3+ leukocytes. Urine microscopy revealed 12-15HPF WBC, 25- 30 HPF red blood cells and 2+ bacteria. Urine culture grew a heavy growth of *Escherichia coli* sensitive to Augmentin 3+ and Cephalexin & Meropenem 3+. Imaging studies such as Kidney-ureter- bladder radiograph (KUB) showed a giant radio-opaque shadow in the bladder region measuring $10 \times 9 \times 5.5$ CM, lying obliquely on the left side of the bladder [figure 1]. Ultrasonography and Non- contrast computed tomography of the urinary system revealed a hyper dense stone inside the urinary bladder measuring $11 \times 9 \times 5.6$ cm with density of 1220 Hounsfield, bilateral mild degree of Hydro-ureteronephrosis, thick wall of the urinary bladder, moderately increased mucosal thickening with multiple diverticulae suggesting chronic cystitis. Under general anesthesia and through infra-umbilical vertical incision, she underwent open Cysto-lithotomy and a giant hard grayish white calculus measuring $10 \times 9 \times 5.5$ CM and weighing 284 grams was removed [figure 2] The calculus was adherent to bladder mucosa which was acutely inflamed and multiple diverticulae were observed, but no visible lesion necessitating biopsy was found. After flushing of the urinary bladder, it is closed in two layers with Vicryl 2/0 with fixation of pelvic drain and supra-pubic cystostomy tube through Mitrofanof. She passed an uneventful post- operative course apart from persistence of urine leakage through pelvic drain which ceased after five days. She is discharged home on the 6th day post-operatively. The pelvic drain and the Supra-pubic tube were removed on the 7th and 14th day post-operatively respectively. The stone was sent for chemical analysis and turned out to be of struvite type. She was seen at the Urology outpatient department one month and three months postoperatively. At the follow-up visits, she was doing well and symptoms free.



Fig 1. Abdominal radiograph (KUB) showing a giant oval Vesical calculus lying obliquely in the bladder region.



Fig 2. Giant Vesical calculus removed by Cystolithotomy and measuring $10 \times 9 \times 5.5$ cm.

DISCUSSION

Bladder calculi account for 5% of urinary calculi and usually occur because of bladder outlet obstruction, neurogenic voiding dysfunction, urinary tract infection, or foreign bodies [7, 8]. Approximately they account for about of 1.5% of urological admissions [9]. Bladder stones are relatively uncommon, and giant bladder stones are now very rare. A solitary bladder stone is the rule, but multiple stones are found in up to 25% [10]. Bladder stones are often of small to moderate size, but occasionally an enormous (giant) stone may be encountered [11]. Although the occurrence of giant Vesical calculus is a rare clinical entity; it is the most common, recurrent and late complication of augmentation cystoplasty. The met analysis conducted by Matheora et al. in 2000 showed a prevalence that range from 18.2% to 52.5% and the average time of occurrence of bladder stone after surgery is 38 months [12]. Bladder stones show great variation in size. Until now, the world's largest stone was reported by Arthur in 1953 with a weight of 6294g and was thought to be developed in the bladder diverticulum. Few more cases of large bladder stone were reported in 1921 by Randall, who reported a stone of 1914-g weight. In 1952, Powers and Matflerd reported bladder stones weighing 1410 g. Now a days, due to early presentation and better management, these sizes of bladder stone are seen very rarely [13].

Lithogenesis is related to some specific factors such as, recurrent urinary tract infections, most commonly urea splitting organisms in an alkaline environment, copious mucous secretion by intestinal segment removed which act as nidus, urinary stasis and poor urinary emptying and intravesical foreign bodies (sutures, stables) [12-14]. In addition of the aforementioned risk factors, the type of bowel segment used in the reconstruction is important in the lithogenesis. The most commonly used bowel segment is a de-tubularized ileum, usually resected from 25 to 40 cm of the ileocecal valve [15]. There is, however, a lower incidence of formation of stones after gastrocystoplasty, which might be due to lower quantity of mucus production, the lower urinary PH, and the lower incidence of bacteriuria [16,17]. Bladder calculi are 5 times more common in augmented bladders in which the patient is on self-catheterization, [18] and in the

Mitrofanof procedure, it is 10 times more common [17]. Bladder calculi have a varied presentation ranging from completely asymptomatic to dysuria, lower abdominal pain, gross hematuria, and retention of urine [2]. The diagnostic methods of bladder calculi diagnosis include plain radiography (KUB), ultrasonography and computed tomography. Regarding the treatment modalities of bladder calculi; multiple surgical treatment modalities are available. Treatment is individualized as per size of stone, number of stones, urethral access and associated comorbidities [19, 20]. Bladder calculi can be treated with transurethral or percutaneous cystolithotripsy. However, large and multiple stones with no urethral access as described in our case require open surgery [6]. Minimally invasive choices as extracorporeal lithotripsy is available but do not appear to have a good result in calculi greater than 2cm [21,22]. Surgical techniques, Surgical endourological or open approaches have a main role in the giant bladder calculosis [23]. In addition to the aforementioned modalities, percutaneous techniques have shown to be safe and feasible, especially in patients without clear urethral access and children. The procedure consists of approaching the bladder by Suprapubic puncture, creation of a path to insert an Amplatz sheath or a trocar, then the endoscopic lithotripsy is performed with lithotripter ultrasonic, pneumatic or even laser energy [11,24] These calculi are usually composed of triple phosphate, calcium carbonate and calcium oxalate [4]. Post-operative management is based on hygiene, dietary measures, the prevention of risk factors and maintaining a normal diuresis that is 1cc/ kg as well as (in case of intermittent sounding) Practicing 6 to 8 emptying per day to avoid urinary stasis [14].

A biannual medical examination is recommended combine with a radiological, kidney examinations and urine sterilization. Drug treatment for mucus secretion management in the bladder is useful in the prevention of lithiasis occurrence [25, 26]. Fan et al. demonstrated that Mitomycin C clearly reduced the concentration of mucus and sialic acid in the urine, without visible lesion of the mucous membrane of the neo- bladder ileum. Therefore, Mitomycin C may provide a new therapeutic approach for the management of mucus secretion in bladder enlargements [26]. According to Khorrani Mh et al., Somatostatin and the analog (Sandostatin) resulted in decreased mucus production by the intestinal segment of the neobladder. Patients receiving Sandostatin no longer require routine postoperative irrigation of the bladder, thus contributing to a shorter hospital stay [27].

CONCLUSION

Generally, and although the occurrence of giant Vesical calculus is a rare clinical entity; it is the most common, recurrent and late complication of augmentation cystoplasty, and it is 10 times more common after a Mitrofanof procedure. It should be followed up by regular bladder wash, dietary regulation and long- life surveillance is advisable.

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Ethical approval

The director's approval was taken before the collection of data from the medical records.

Consent for publication

A written informed consent was obtained from the patient for publication of this case report and any accompanying images and it is ready to be sent on request by the editor in chief.

Conflict of interests

There are no conflicts of interest regarding the publication of this paper.

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