

Giant Vesical Calculus

G Shilpi, S Onkar, S Sumit, K Mathur Raj

Citation

G Shilpi, S Onkar, S Sumit, K Mathur Raj. *Giant Vesical Calculus*. The Internet Journal of Surgery. 2007 Volume 17 Number 1.

Abstract

Introduction: A giant vesical calculus weighing more than 100g is a rare finding in the modern urosurgical practice. Fewer than 30 reports are available in the English literature with a weight of the stone of more than 100g.¹ The largest vesical calculus reported in the literature is of 6294 gram by Arthure et al.² While the exact causes of the formation of bladder stones are not completely understood, bladder stones usually occur because of urinary tract infection (UTI), obstruction of the urinary tract, enlargement of the prostate gland in men, or the presence of foreign bodies in the urinary tract. Diet and the amount of fluid intake also appear to be important factors in the development of bladder stones. These are more common in men and the majority of these are composed of triple phosphate. Available treatment options for vesical calculi include open surgical removal, extracorporeal fragmentation and endoscopic crushing followed by extraction of pieces. Recently, endosurgical mechanical cystolithotripsy followed by percutaneous extraction has been evolved for small or moderate-sized calculi.

Conclusion: Our case report demonstrates occurrence of a vesical calculus weighing more than 100g which is a rare finding in today's urosurgical practice.

CASE REPORT

A 62-year-old male presented with complaints of difficulty and burning sensation while passing urine for the last 8 years associated with pain over the hypogastric area for 2 years. He had a history of recurrent urinary tract infections for the last 6-7 years for which he took medical treatment many times. There was history of passage of blood and pus flakes in urine on different occasions. On examination, a non-tender, firm lump was palpable in the hypogastric region. Per rectal examination revealed a hard and mobile mass in the urinary bladder. Per urethral catheterization was tried but the patient could not be catheterized. Routine examination of urine detected multiple RBCs and WBCs and the urine culture grew *E. coli*. Plain radiograph of the KUB region (Fig. 1) showed a large radio-opaque shadow in the pelvis and another very small shadow near the neck of the bladder (marked by arrow). Ultrasound of abdomen and urethra confirmed the presence of a vesical calculus of 11x8x8cm and a prostatic urethral calculus of 1x1cm. Serum calcium and PTH level was normal. Suprapubic extraperitoneal cystolithotomy was done and a yellowish brown hard stone weighing 380g, with fine spicules on its surface, was removed (Fig. 2 and 3). There was no bladder diverticulum. A urethral dilator was passed through the urethra and the stone impacted near the bladder neck was pushed into the bladder and extracted. The patient was catheterized and the

bladder closed in two layers. The catheter was removed on the fourteenth day and the patient passed urine comfortably with good stream. Biochemical examination showed a calcium oxalate stone.

Figure 1

Figure 1: Plain radiograph of the KUB region showing a large radio-opaque shadow in the pelvis and another very small shadow near the neck of the bladder (marked by arrow).



Figure 2

Figure 2: Large yellowish brown stone being extracted from the urinary bladder.



Figure 3

Figure 3: Specimen of large hard stone weighing 380g with fine spicules on its surface.



DISCUSSION

Urinary bladder calculi are a rare clinical entity (accounting for 5% of all urinary calculi).^{3,4} Giant vesical calculi weighing more than 100g are even rarer, especially in today's modern urologic practice.^{1,4} This is supported by the fact that only about 30 cases of urinary bladder calculi having more than 100g of weight have been reported in the English literature.¹ The largest one ever reported in the history is of 6294g by Arthur et al.²

Females are generally less commonly affected than males as ninety-five percent of all bladder stones occur in men.^{3,5} Bladder calculi most often occur in conditions of chronic urinary retention, bladder outlet obstruction or urinary tract infection.^{3,5} These conditions are commonly precipitated by development of a bladder diverticulum^{5,6}, benign prostatic hypertrophy in males, genital prolapse in females³ or urethral stricture. Prolonged catheterisation, neurogenic bladder, foreign body and trauma are other rarer causes.⁵ There are case reports of formation of bladder stones around a foreign body, sutures, catheters or other objects introduced into the bladder which act as a nidus for stone formation.³ Pomerantz et al. have reported a rare case of formation of urinary bladder calculus around an arterial graft, which was incorporated in the bladder.⁵ It is thought that a giant vesical calculus develops from the nidus of the infected material or from a single ureteric calculus with progressive layer-wise deposition of calcified matrix. Thus, each of the earlier stated factors may mutually contribute to the formation of a

calculus.⁷ Also, studies have indicated that infection may not be the inciting factor in stone formation, but may play a major role in further stone crystallization.³

Most of the vesical calculi are composed of triple phosphate, calcium carbonate, and calcium oxalate. Becher et al. have reported a giant uric acid vesical calculus of 235g with a minor component of asymmetrical calcium oxalate.¹ Presentation of patients with giant vesical calculus is commonly with recurrent urinary tract infection, hematuria, inability to pass urine and azotaemia.⁸ Complaints of suprapubic discomfort or pain may or may not be there. Patients in urinary retention caused by a vesical calculus usually pass urine in supine position. Chronic obstruction to urine flow due to a vesical calculus further leads to infection, and, rarely, bladder perforation,^{9,10} hydronephrosis, and acute renal failure.^{1,8}

The majority of bladder calculi are radiopaque and detected by plain radiograph. Other investigations which can show bladder calculi are ultrasound, CT-scan, magnetic resonance imaging and intravenous urogram but contrast-enhanced CT is the investigation of choice as it has remarkable sensitivity in detecting urinary tract stones, including uric acid stones. It can reveal the concentric nature of stones.

Various surgical modalities are available for vesical calculi which include open surgical removal, extracorporeal fragmentation and endoscopic crushing followed by extraction of pieces. For giant stones open surgery has been recommended as the best modality.⁸ Recently, endoscopic mechanical cystolithotripsy followed by percutaneous extraction has been evolved for small or moderate-sized calculi. It has an added advantage as it can be combined with

a corrective procedure for bladder outlet obstruction.¹¹ Electrohydraulic shockwave lithotripsy (EHSWL) is preferably to be avoided in hard, large vesical calculi and if the stone is in a diverticulum or stuck to the mucosa.¹²

CORRESPONDENCE TO

Dr. Shilpi Gupta Senior Resident of Surgery, Department of Surgery, M.G.M Medical College & M.Y. Hospital, Indore. Madhya Pradesh, India-452001 (Contact no.: +91-94253-42100) (email: drguptashilpi@gmail.com)

References

1. Becher RM, Tolia BM, Newman HR. Giant vesical calculus. *JAMA* 1976; 239: 2272-3.
2. Harrison JH, et al. *Campbell's Urology*. 4th ed., Philadelphia WB Saunders Co. 1978; 853-4.
3. Schwartz BF, Stoller MZ. The vesical calculus. *Urol Clin North Am* 2000; 27: 333-46.
4. Besiland C, Anderson M. Giant urinary bladder stone. *Tideskr Nor Laegeloren*. 2000; 120: 573-4.
5. Pomerantz PA. Giant vesical calculus formed around arterial graft incorporated into bladder. *Urology* 1989; 33: 57-8.
6. Di Tonno F, Forte M, Guidoni E, et al. A giant bladder stone. *Br J Urol* 1988; 62: 90-91.
7. Leach GE, Fitzpatrick TJ. Giant vesical calculi in the female. *Urology* 1981; 17: 274-275.
8. Maheshwari PN, Oswal AT, Bansal M. Percutaneous cystolithotomy for vesical calculi: a better approach. *Tech-Urol* 1999; 5: 40-2.
9. Kaur N, Attam A, Gupta A, Amratash. Spontaneous bladder rupture caused by a giant vesical calculus. *Int Urol Nephrol* 2006; 38: 487-489.
10. Basu A, Mojahid I, Williamson EP. Spontaneous bladder rupture resulting from giant vesical calculus. *Br J Urol* 1994; 74: 385-386.
11. Asci R, Aybek Z, Sarikaya S, BuyukalPELLI, Yilmaz AF. The management of vesical calculi with optical mechanical cystolithotripsy and transurethral prostatectomy: is it safe and effective? *BJU Inter* 1999; 84: 332-6.
12. Zhaowu Z, Xiwen, Fenling Z. Experience with electrohydraulic shockwave lithotripsy in the treatment of vesical calculi. *BJU* 1988; 61: 498-9.

Author Information

Gupta Shilpi, M.B.B.S., M.S. (Gen Surg)

Senior Resident of Surgery, Department of Surgery, M.G.M Medical College & M.Y. Hospital

Singh Onkar, M.B.B.S., M.S. (Gen Surg)

Senior Resident of Surgery, Department of Surgery, M.G.M Medical College & M.Y. Hospital

Shukla Sumit, M.B.B.S., M.S. (Gen Surg),

Associate Professor, Department of Surgery, M.G.M Medical College & M.Y. Hospital

K. Mathur Raj, M.B.B.S., M.S. (Gen Surg), F.I.C.S.

Professor of Surgery, Department of Surgery, M.G.M Medical College & M.Y. Hospital