

A Giant Vesical Stone Causing Impending Rupture of Bladder During Labor

Chakraborty Barunoday · Mondal Prabhat Chandra ·
Sahana Ramkrishna · Barman Sannyasi Charan

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About the Author



Barunoday Chakraborty was graduated from Bankura Sammilani Medical College, Bankura, West Bengal and completed residency training at Medical College, Kolkata leading to Diploma degree in Gynecology and Obstetrics in 1991. He took his MD degree from Government Medical College, Patiala, Punjab in 1994. He passed the DNB examination in the same year, and he is currently a fellow of Indian College of Obstetricians and Gynecologists. He worked as Medical officer in West Bengal health service for six years. Now, he is working as an Associate Professor at Bankura Sammilani Medical College. He feels working in a busy and rural setup is a great pleasure and also challenging. He had treated many interesting cases here, which are rare in Western countries. His interest is to collect the academic value and highlight them to the resident doctors all over the India.

Introduction

Giant vesical calculus (more than 100 g) is a very rare clinical entity [1]. During pregnancy, it may be associated with infections, abortions, premature delivery, urinary fistula, and rarely dystocia of labor [2]. When bladder stone (BS) remains asymptomatic and thereby gains large size of several centimetres, it may be diagnosed first time during labor when timely interventions must be taken to prevent

vesico-vaginal (VVF) or vesico-cutaneous fistula [2]. Here, we described a case of giant bladder stone diagnosed during labor which was associated with impending rupture of bladder, anuria, and hemorrhagic cystitis.

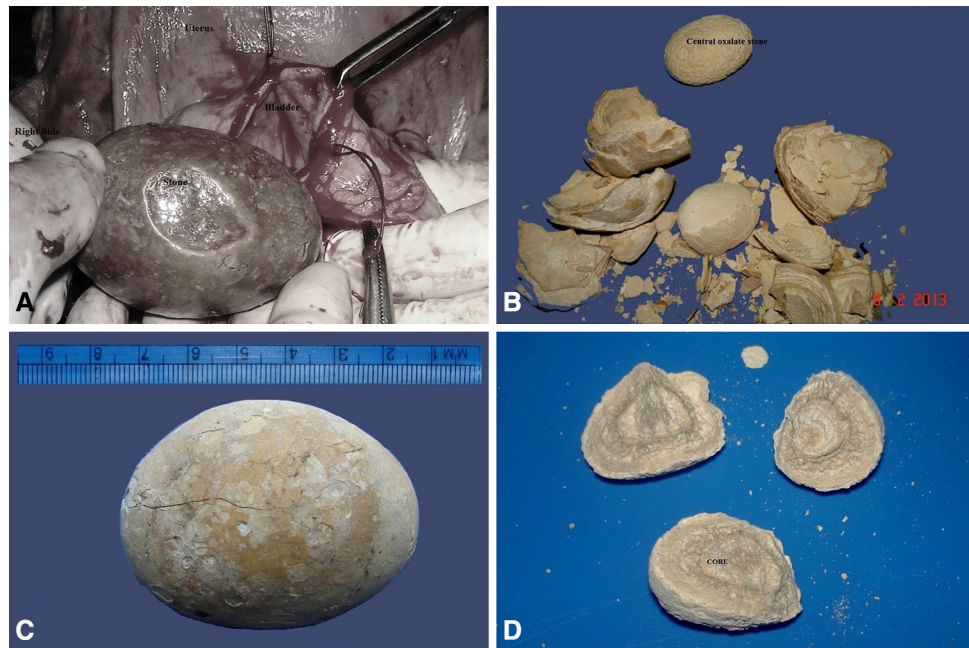
Case Report

A 25-year-old second gravida woman with an uncomplicated vaginal delivery 3 years back was referred from a peripheral health center due to anuria for last 12 h and a mass in the vagina at 37 weeks of gestation. She had 3 antenatal check-up since 20 weeks of gestation without any ultrasonography. She did not have any complication during the antenatal period that needed hospitalization. In the morning on the day of admission, she felt difficulties in passing urine with pain in lower abdomen. Initially, the pain was intermittent then became regular, and she attended nearby hospital. Suspecting a case of pelvic bone tumor, she was referred. On examination, she had cephalic

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Chakraborty B., Associate Professor ·
Mondal P. C. (✉), Assistant Professor ·
Sahana R., Assistant Professor · Barman S. C.,
Residential Medical Officer cum Clinical Tutor
Department of Gynecology and Obstetrics, Bankura Sammilani
Medical College and Hospital, Gobindanagar, Bankura 722102,
West Bengal, India
e-mail: prabhatmndi@yahoo.co.in

Fig. 1 **a** Giant stone has been removed by cystolithotomy. **b** The stone measuring $6 \times 4 \text{ cm}^2$. **c** Broken stone showing several layers with a central oxalate stone. **d** Core of the stone contains no foreign body



presentation, 5 centimeter cervical dilation, and zero station with regular painful uterine contractions. A hard, globular, tennis ball size mass was found in the anterior vaginal wall between the head and symphysis pubis. It was moving side to side during uterine relaxation but not above downward. Simple rubber catheter was tried, but it could not be introduced. With repeated contractions, the mass did not dislodge, and there was no descent of the head. While preparing for cesarean delivery, suddenly the mass was found prominent during the uterine contractions at the vaginal introitus. Due to the fear that the bladder might be ruptured if delivery is delayed, immediate lower segment cesarean section (LSCS) was done, and a 2.6 kg healthy boy baby was delivered within 15 min of detection of mass outside vagina. The bladder was found edematous with a hard, movable mass within it. Considering it a bladder stone, cystotomy (Fig. 1a) was done followed by a $6 \times 4 \text{ cm}^2$ calcium phosphate stone (Fig. 1b) weighting 106 g was removed. The bladder wound was closed in two layers, and Foley catheterisation was done. Cystotomy wound was found watertight after being checked by methylene blue. Postoperative ultrasonogram showed bilateral hydronephrosis. She was treated conservatively. On subsequent USG, hydronephrosis was found subsided. Foley catheter was removed after 10 days, and she was discharged after another 2 days. During follow-up visit after 6 weeks, she had no complaint. The surface of the stone was friable, and it was composed of phosphate. After removing several layers of phosphates, a solid oxalate stone was recovered (Fig. 1c) within it, no foreign body was found (Fig. 1d).

Discussion

The incidence of bladder stone in developed countries has been decreasing since 19th century due to improved nutrition and infection control [3]. Available evidence shows that 5 % of all urinary stones are found in urinary bladder, and approximately 5 % of all BS occur in women [3]. Due to rarity and unfamiliar condition during labor, we searched the case reports according to the analysis by Seth et al. [1, 2, 4–18] as well as other cases indexed in Pubmed since 2002–2012 and tried to document its mode of diagnosis, complications and management during antenatal period and labor (Table 1). Though bladder stones are often found in women with urinary stasis due to outlet obstruction (pelvic organ prolapse, urethral stricture) and detrusor instability resulting in significant post-void residual urine, it is also found in healthy women [3]. Alkaline urine caused by urea splitting organisms (*Proteus*, *Klebsiella*, *Serratia*, and *Enterobacter*) is responsible for struvite stones (ammonium magnesium phosphate) [3]. Foreign bodies such as retained non-absorbable sutures, synthetic slings, or mesh used for treatment of stress incontinence or pelvic organ prolapse, and migrated intrauterine copper-T within the bladder have lithogenic potentiality. Kidney stone if dropped in bladder may remain as foreign body and attains larger size due to deposition of phosphates around it [3, 19]. The stone described here was phosphate containing several layers, but the core was an oxalate stone as detected on chemical analysis. We believe that oxalate stone originated in kidney and subsequently dropped in bladder and became larger in size. Bladder stone is usually associated

Table 1 Cases of vesicular stone detected during pregnancy, reported from 1916 to the present date

Year	Size of stone	Symptoms	Diagnosis	Mode of delivery	Timing of stone removal	Complication
Lockyer [5]	5.5 inch in circumference		During fistula repair	Instrumental	Stone removed during fistula repair	Vesico-vagino-cervical fistula
Neer [6]	2.75 inch	Pain and tenderness in the lower abdomen		FD at full term	Cystolithotomy after 2 months of delivery	
Bride [7]	6.5 × 6 × 3.5 cm	Feeling of pressure in suprapubic region	X-ray	CS at 36 weeks	Cystolithotomy in second sitting	
Williams [9] case 1		Pain on micturition and difficulty in emptying a bladder	X-ray	VD at 39 weeks	Antenatal Cystolithotomy at 32 weeks	
Williams [9] case 2		Pain on micturition, hematuria, frequency	X-ray	VD at 32 weeks	Antenatal Cystolithotomy at 24 weeks	Premature labor
Famcombe [8]	4.5 × 2.5 inches	Dysuria, incontinence, blood stained vaginal discharge	X-ray	VD at 32 weeks	Cystolithotomy at 7 th day of puerperum	Premature labor
Sarma and Chir [10]		Dysuria, hematuria	X-ray	FD at full term	Cystolithotomy after CS	Retention of urine
Cope [11]		Frequency and dysuria	X-ray	CS at 37 weeks	Cystolithotomy after CS	Still born
Van Coeverden De Groot [12]	5 cm		X-ray	CS at full term	Cystolithotomy after 2 months of CS	
Armon (1977)	8 × 6.5 × 6 cm ³	Frequency	X-ray	CS at full term	Cystolithotomy after 4 weeks of CS	UTI, vesico-cervical fistula
Egwuatu [13]	4.7 × 4.2 cm ²		X-ray	CS at 38 weeks	Cystolithotomy after CS	
Vanderputte [14]	6 cm in diameter			CS at full term	Cystolithotomy after CS	
Penning et al. [2]	7 × 5.3 × 4.2 cm ³	Frequency, dysuria, inability to void, pain abdomen		CS at 38 weeks	Cystolithotomy after CS	Vesico-cutaneous fistula
Rai et al. [16]	9 × 4 cm ²			CS at full term	Cystolithotomy after CS	
Ndirangu [15]		Lower abdominal pain, frequency, dysuria	X-ray	CS at 37 weeks	Cystolithotomy after CS	Vesico-cutaneous fistula at 32 weeks
Seth et al. [4]	4.5 × 3.5 × 1.3 cm ³			CS at 34 weeks	Cystolithotomy after CS	Premature labor
Ait Benkaddour et al. [17]	8 × 6 × 4 cm ³			CS at 39 weeks	Cystolithotomy after CS	
Escobar-del Barco et al. [1]	6.8 × 6 × 5.3 cm ³	Hematuria, inability to pass urine, suprapubic pain	USG at 25th week	CS at 38.4 weeks	Antenatal Cystolithotomy at 25 weeks	
Keepanasseril et al. [18]	6 × 5 × 4 cm ³	Difficulty in initiation of micturition		CS at 38.2 weeks	Cystolithotomy after CS	

FD forcep's delivery, CS cesarean section, VD vaginal delivery

with irritating symptoms such as dysuria, pain, incontinence, urinary urgency, and frequency. However, BS if does not obstruct the bladder inflow or outflow and become infected, it may remain asymptomatic and become several centimeters in size which is found incidentally [3]. The symptoms usually found due to BS are often being overlooked as pregnancy-associated physiological symptoms, as the distinction of clinical features between normal physiology and pathology during pregnancy is often unclear [20]. In our case, the patient might have mild mechanical symptoms such as frequency, dysuria, and pain in suprapubic area probably caused by the stone and treated conservatively. BS is diagnosed by X-ray and intravenous pyelogram which are not commonly performed during pregnancy [17]. Ultrasonogram is prescribed several times during pregnancy, but it can miss BS in the second half of pregnancy due to interference of the fetal head [17]. It may be very difficult to diagnose BS during pregnancy if strong symptoms do not develop and persist, or clinician is not suspicious. Escobar-del et al. [1] diagnosed a case that had hematuria, difficulties to pass urine, and suprapubic pain for 48 h in the antenatal period. In our case, we got a bony-hard mass between cervix and symphysis pubis, but it could not be focussed by USG due to interference of head. The management of giant bladder stone depends on duration of gestational age. If it is symptomatic and diagnosed during antenatal period, then cystolithotomy is preferred [1, 9]. Cesarean section (CS) with cystolithotomy [10] is the procedure of choice (Table 1). However, when it is diagnosed in early labor before the engagement of fetal head, vaginal delivery can be possible if the stone is pushed above the head [17]. If the stone is neglected, then it can be trapped between symphysis pubis and fetal head causing arrest of fetal descent, dystocia of labor [2, 4, 6, 10–18]. Rarely, the stone becomes dislodged and comes in front of fetal head. Subsequent pressure on fetal head by each and every uterine contraction causes prolapse of the stone along with anterior vagina causing pressure damage to the bladder wall [10]. If stone is detected at this stage, then CS with cystolithotomy (as done in our case) may be associated with post operative hematuria and VVF [17]. If labor is further neglected to allow, then stone may be expelled out by rupturing bladder and vaginal walls [10].

Conclusion

In our case, we did emergency LSCS to prevent further damage to the bladder; subsequent cystolithotomy was uneventful. In conclusion, we have known that giant bladder stone itself is a very rare clinical entity. It is rarely diagnosed during labor. During pregnancy, symptoms due to bladder stone may be missed as exaggerated pregnancy

related symptoms. If giant BS is diagnosed during antenatal period, then cystolithotomy should be done and cesarean delivery can be avoided, but the indications are same as for non-pregnant state. If BS is found during labor, then CS with cystolithotomy should be done to minimize bladder damage and chances of fistula formation.

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Conflict of Interest We do not have any conflict of interest.

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