

## Imaging Study in Female Voiding Dysfunction (III): A Giant Bladder Stone Caused Voiding Difficulties

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### BRIEF HISTORY

A 58-year-old woman, gravida 2, para 2, presented to our urogynecologic clinic with history of frequency, urgency, and urge incontinence. These symptoms had occurred intermittently during a 3-year period. Seven years previously, she was diagnosed with endometrial cancer and underwent total abdominal hysterectomy, bilateral adnexectomy, pelvic and paraortic lymph node sampling, and partial omentectomy. The pathologic staging was stage IIB and grade III. Therefore, radiotherapy was administered postoperatively. Four years after the radiotherapy, her lower urinary tract symptoms began. At that time, her urinalysis results were negative for infection. A urodynamic study showed unstable detrusor contractions on filling-phase cystometry. Transvaginal ultrasound did not reveal any intravesical tumor or blood clots. The bladder wall thickness at the trigone and dome were 11.7 mm and 15.0 mm, respectively. The lower urinary tract symptoms were suppressed using anticholinergics.

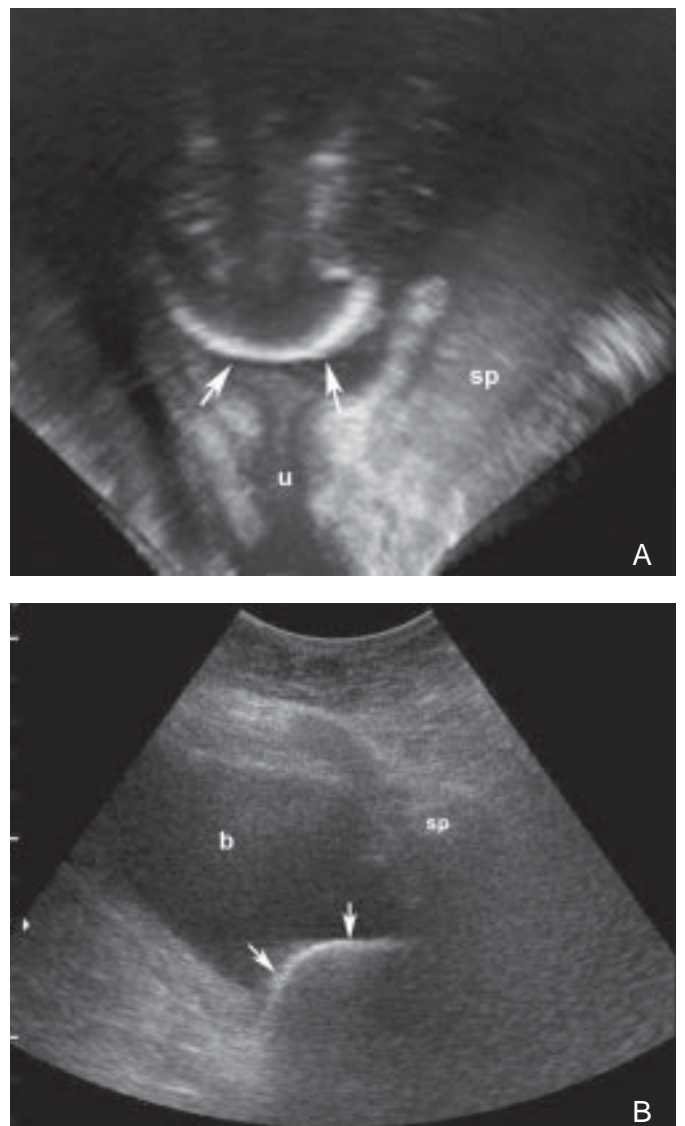
One year later, she again had urinary frequency and dysuria, and a stone was extracted from her urethra. Six months after the extraction, the lower urinary tract symptoms recurred. At that time, a urinalysis revealed numerous red blood cells and pyuria. The symptoms were attributed to cystitis, and they improved using a course of antimicrobials. However, after another 6 months, she came to our clinic again complaining of urinary frequency for 10 days, voiding difficulty, and sometimes unexpected interruption of urinary flow during voiding.

### CLINICAL EXAMINATION

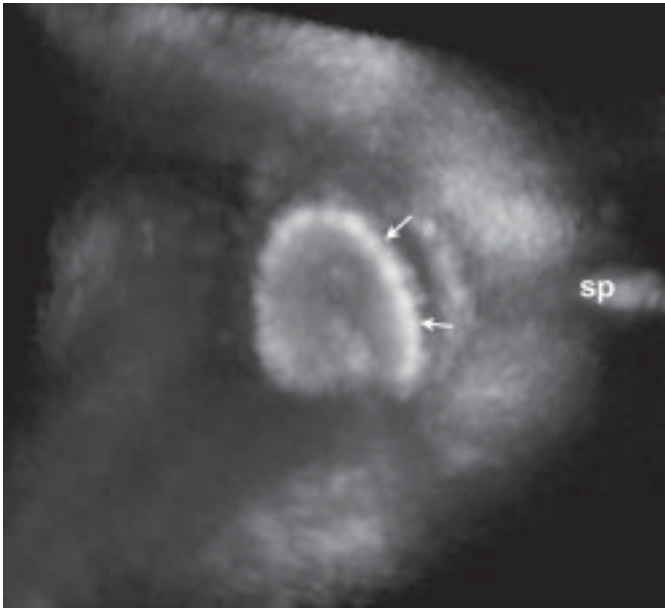
On physical examination, there was no evidence of local recurrence of the endometrial cancer, and no enlarged inguinal lymph nodes were palpable. Urinalysis revealed numerous red and white blood cells per high-power field.

### IMAGING STUDY

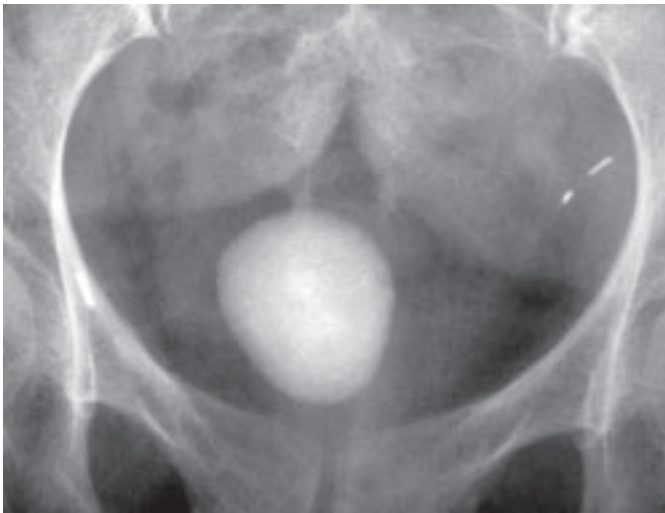
Ultrasonography was performed using a Voluson 730 ultrasound scanner (GE Medical Systems, Zipf, Austria) equipped with a 5.0-9.0 MHz vaginal probe to explore the possible pathogenesis of her urinary symptoms. In the lower part of the urinary bladder, a convex echogenic curvilinear structure, about 4 cm in diameter, was found on 2D ultrasound (Fig. 1) and an eggshell like object was disclosed on 3D scanning (Fig. 2). A plain abdominal radiograph revealed an ovoid-shaped, hyperechoic object located within the pelvis (Fig. 3).



**Fig. 1.** Transvaginal (A) and transabdominal (B) ultrasonographic appearances of a bladder stone (arrows), which is displayed as a convex echogenic curvilinear structure. (sp = symphysis pubis; u = urethra; b = bladder)



**Fig. 2.** Three-dimensional scanning (transverse view) revealing an eggshell like echogenic object located in the lower part of the urinary bladder. (sp = symphysis pubis)



**Fig. 3.** Plain abdominal radiograph.



**Fig. 4.** Cystourethroscopic findings. The stone has a ragged speculate surface.

### SURGICAL INTERVENTION

Cystoscopy revealed a white stone with a ragged spiculate surface (Fig. 4). The stone was easily and freely movable without any adherence to the bladder wall. The stone was subsequently fragmented using endoscopic cystolitholapaxy and removed via a cystoscope. The patient made an uneventful recovery with complete relief of her symptoms. One week after the procedure, ultrasonography revealed no stone within the bladder.

### COMMENTS

Plain abdominal film, cystoscopy, non-contrast computed tomography, and ultrasonography are common methods used to confirm the presence of bladder calculi [1-3]. Cystoscopy is of use both diagnostically and in planning and carrying out treatment. This procedure allows for visualization of stones and assessment of their numbers, sizes, and positions. Additionally, examination of the urethra, bladder wall, and ureteral orifices allows for the identification of strictures, obstructions, bladder diverticula, and bladder tumors [2,3]. However, cystoscopy is not justified as an initial screening process for women with lower urinary tract symptoms, who may have diverse pathogenesis. Transvaginal ultrasonography, with a high-resolution endovaginal probe, can clearly differentiate various intravesical objects. With the widespread availability of transvaginal ultrasonography, increasing numbers of physicians can therefore use this inexpensive and rapid modality for the exploration or exclusion of bladder calculi in women with lower urinary tract symptoms. A hyperechoic object with posterior acoustic shadowing is the typical finding of bladder stones on ultrasonography [1,2,4]. However, in this case, 2D and 3D ultrasound displayed another appearance of the bladder stone. A large stone, as in our case, may present unique imaging on ultrasonography. Transvaginal ultrasonography may be an aid in the identification of an underlying cause of the bladder stone, since the most important principle in treating bladder calculi is eradication of the inciting source. Successful identification of a retained suture using transvaginal ultrasonography, a finding which had been missed by serial x-rays and cystoscopy, was reported [4]. Thus, transvaginal ultrasonography can provide an initial non-invasive assessment for women with lower urinary tract symptoms.

### REFERENCES

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