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Cystolitholapaxy and laparoscopic sacrocolpopexy in a case of multiple urinary bladder calculi & vault prolapse

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ABSTRACT

Vesical calculi are more common in men than women. The prevalence in women is less than 2%. Multiple vesical calculi in chronic cases of utero vaginal prolapse or vault prolapse is rare. Urinary stasis, urethral kinking along with chronic infection are the probable predisposing factors for stone formation [2]. We report a case of 65 year old female, with mass per vagina since 10 years, who developed acute urinary retention due to impaction of vesical calculus at the external urethra meatus. Subsequently in a span of 12 h she passed 3 more vesical calculi. KUB X-ray failed to show any calculi but Computed Tomography(CT) Kidney Ureter Bladder (KUB) showed 2 vesical calculi. After cystolitholapaxy she underwent laparoscopic sacrocolpopexy for vault prolapse. In cases of chronic uterovaginal prolapse or vault prolapse X-Ray KUB should not miss the prolapsed part of the cystocele as calculi are present in the most redundant part. Chances of missing radiolucent uric acid calculi is high. In such cases CT KUB is essential.

Case report

We report a case of 65 year old female, who presented with mass per vagina since 10 years irreducible since 6 months and on and off pain abdomen with dysuria. She underwent Total abdominal hysterectomy 30 years back for a benign uterine mass. During her hospital stay for vaginal tampooning and magnesium sulphate dressing for irreducible vault prolapse she developed acute urinary retention due to impaction of vesical calculus at the external urethra meatus. The calculus did not come out easily and had to be crushed with mosquito forceps. Subsequently in a span of 12 h she passed 3 more vesical calculi spontaneously. All basic investigations were normal including renal function tests except for urine routine showing 10–15 pu s cells and occasional urate crystals. The pH was 5.0. Culture sensitivity grew 10,000 colonies of Acinetobacter species and repeat culture showed no growth in the second sample. Serum uric acid was 5.32 mg/dL, serum magnesium was 2.4 mg/dL, serum calcium 9.44 mg/dL. KUB x ray failed to show any calculi and CT scan was suggested for further evaluation. CT -KUB showed 2 calculi in the dependent position of the urinary bladder measuring13 × 10 mm and 11 × 9.5 mm. CT -KUB without contrast showed 2 calculi in the dependent position of the urinary bladder measuring13 × 10 mm and 11 × 9.5 mm and that accounted for a total of 6 vesical calculi on admission. Ultrasonography (USG)- abdomen and pelvis showed a large calculus measuring 2.8 × 1.5 cm in the region of bladder neck (Fig. 1). Right kidney showed moderate hydroureteronephrosis with lower calyx calculus measuring 3 mm left kidney was normal.

Operation

Cystolitholapaxy

After informed consent patient was put in lithotomy position and under spinal anesthesia transurethral Cystolitholapaxy with SRS(stone removal system) was done and the two anhydr ous uric acid calculi were removed. She was catheterised for 24 h after cystoscopy and after 3 days she underwent laparoscopic sacrocolpopexy for vault prolapse.

Laparoscopic sacrocolpopexy

Under general anasthesia patient was placed in low lithotomy. A 10-mm trocar is placed at the level of the umbilicus for the telescope. Additional three 5 mm operative ports were placed. The peritoneal reflection over the bladder was incised at the junction of the vaginal vault and with sharp dissection the bladder was

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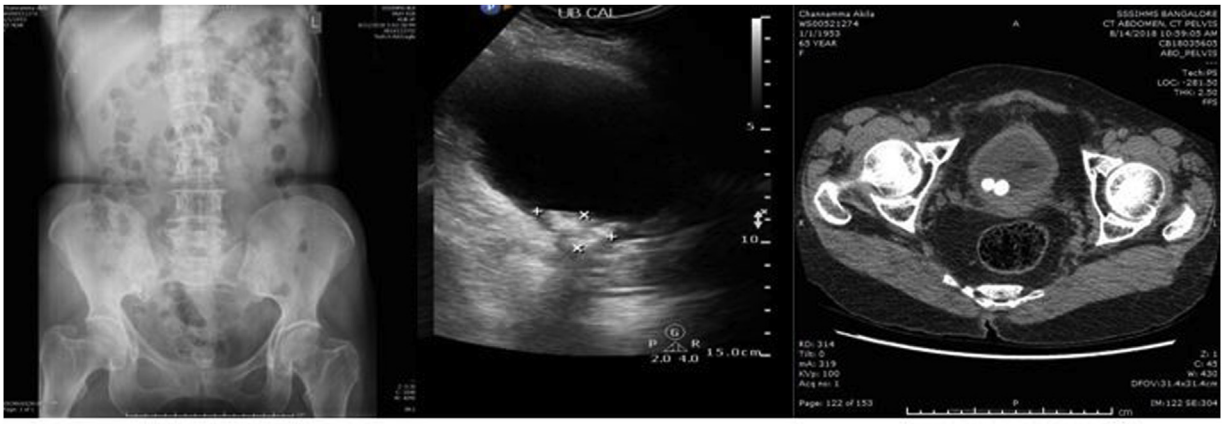

Fig. 1. A) KUB X-Ray failed to show any calculi B) USG- Abdomen with calculi C) CT KUB showing two bladder calculi.

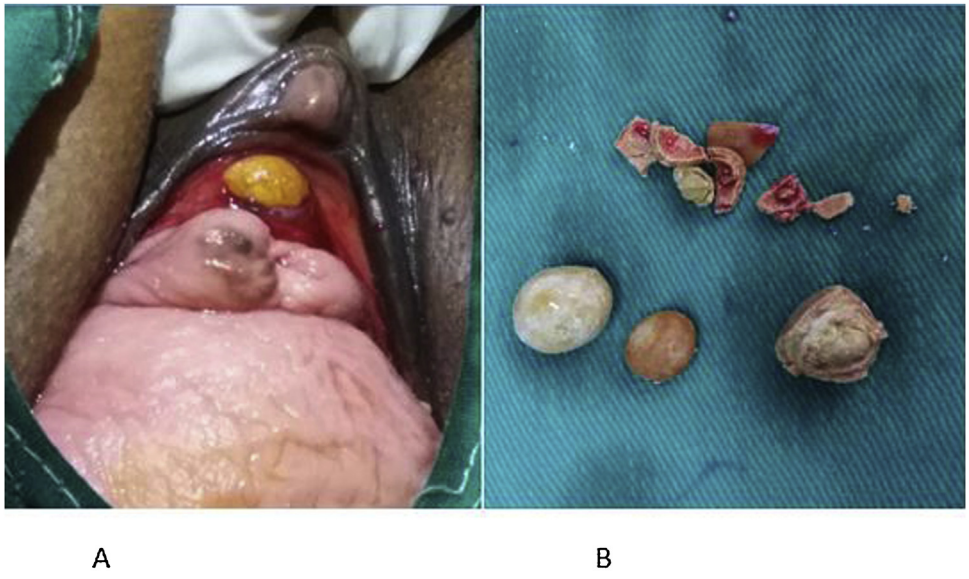

Fig. 2. A) Acute urinary retention due to impaction of vesical B) Broken pieces of bladder calculus which was removed with artery forceps, along with intact bladder calculi expelled spontaneously.

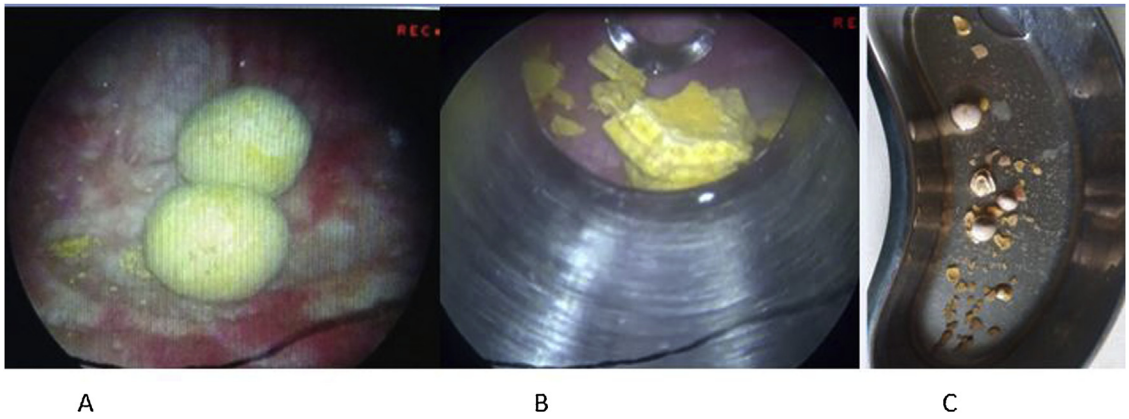

Fig. 3. A) Cystoscopic image showing 2 vesical calculi B) Transurethral Cystolitholapaxy with SRS (stone removal system) C) Bladder calculi after removal.

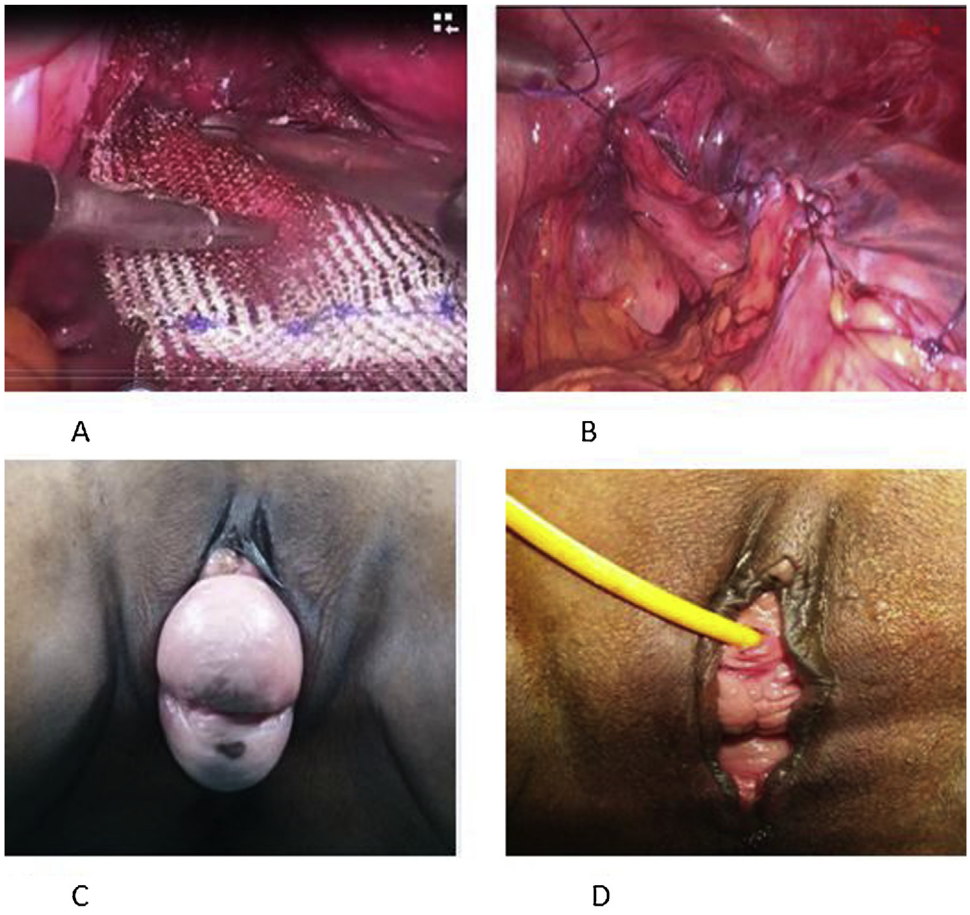

Fig. 4. A) Laparoscopic vault sacrocolpopexy with polypropylene mesh B) Graft covered with peritoneum C) Preoperative image of Vault-prolapse D) Postoperative image.

dissected away from the anterior vagina along the vesicovaginal septum. Dissection was continued posteriorly to separate the vagina from the rectum along the rectovaginal septum. The retroperitoneal space was then exposed by incising the posterior peritoneum in front of the sacral promontory. Care was taken not to injure the middle sacral vessels. A tunnel was created under the peritoneum till the apex of the vagina (Fig. 2).

Preparation and fixation of 'Y' graft

Polypropylene mesh was then trimmed to size. A Y-shaped graft was fashioned from two pieces; a long arm placed anteriorly and a shorter arm posteriorly. The arms were fixed to each other using 2-0 nonabsorbable monofilament suture. The anterior arm was fixed using four nonabsorbable 2-0 monofilament sutures through the pores of the mesh and into the vaginal muscularis. Two sutures were placed at the most distal aspect of the graft and two at the most distal aspect of the anterior vaginal cuff. The sutures were placed deep through the muscularis but care was taken not to enter the mucosa. Similarly four sutures were placed posteriorly (Fig. 3).

The graft was positioned along the retroperitoneal space under the peritoneal tunnel and fixed cranially to the sacral promontory in a tension free manner. The graft is fixation to the anterior longitudinal ligament using two 2-0 nonabsorbable monofilament sutures, was done with utmost care avoiding the presacral vessels. The peritoneal reflection was closed over the graft using absorbable suture to reduce the risk of erosion into the bowel. Postoperative stay was uneventful and she was discharged on 5th postoperative day (Fig. 4).

Discussion

Vesical calculi are more common in men than women. The prevalence in women is in less than 2% [1]. The male to female ratio is around 3:1. Approximately 5% of all bladder stones occur in women [7]. They are usually associated with foreign bodies (sutures, synthetic tapes, or meshes) or urinary stasis due to conditions like cystocele, enterocele of uterovaginal prolapse or findings of prior urethral surgery. The increase in the residual urine which predisposes to formation of vesical calculi. Urinary stasis most likely contributes to crystal formation especially for calcium based bladder stone formation [3]. Vesical calculus can cause azotemia and obstructive uropathy [5,6].

Transurethral cystolitholapaxy is the most common way to manage cystolithiasis. Transurethral cystolitholapaxy with SRS (Stone removal system) has decreased the time taken for the procedure with decreased morbidity. It is a safe and efficient surgical management to bladder stones. SRS is primarily used to fragment and retrieve bladder stones, and is a dedicated endoscopic device with multiple functions such as stabilizing stone, fragmenting stone, automatically collecting fragments, retrieving stone, washing out stone and continuous irrigation in cystolitholapaxy [4,10].

Numerous operations for vaginal vault prolapse repair have been described. Benson and colleagues randomized 88 women to receive either vaginal sacrospinous ligament fixation or abdominal sacrocolpopexy and terminated the study at the interim analysis due to a disparity in outcome favoring the abdominal approach [8]. Reoperation for cystocele was necessary in 29% of those in the vaginal group versus 10.5% of those in the abdominal group. Vaginal vault prolapse recurred in 12% of the vaginal group versus 2.6% of the

abdominal group [8]. In a Cochrane review of 22 randomized controlled trials, abdominal sacral colpopexy was found to have a lower rate of recurrent vault prolapse and less dyspareunia [9].

Conclusion

In our case of long standing vault prolapse with acute retention of urine, basic cost effective investigations like ultrasonography and X-ray KUB did not pick up all the bladder stones due to radio lucent nature of uric acid calculi. Whereas the CT - KUB without contrast showed the radio lucent calculi. The expulsion of vesical calculi in fast succession could be attributed to the vaginal tampooning with magnesium sulphate dressings which restored the bladder into its intrapelvic position thus forcing the calculi to be expelled through the urethra. In all cases of chronic uterovaginal prolapse or vault prolapse X ray KUB must be taken to rule out urinary bladder calculi. The X-ray KUB should not miss the prolapsed part of the cystocele where calculi are present in the most redundant part. But still the chances of missing radiolucent uric acid calculi is high which are more common in case of urinary stasis. In such cases CT KUB is essential.

Declaration of Competing Interest

None.

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