CASE REPORT
A Rare Coexistence of Primary and Secondary Vesical Calculus In A Case of Benign Prostatic Hyperplasia With Suprapubic Cystostomy

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ABSTRACT

Introduction: Secondary bladder calculi are more common than primary vesical calculus. Both these types have distinct pathogenesis. We report the only case so far in literature, giving evidence of the influence of both these mechanisms affecting a single individual with benign prostatic hyperplasia (BPH) who underwent a suprapubic cystostomy. Patients with long term indwelling catheters or suprapubic catheterization have maximum risk of developing secondary bladder stones. Especially, due to colonisation by bacteria which promotes crystallization of minerals leading to stone formation.

Case Report: A 65 year old elderly male who was a known case of grade 3 BPH presented with dribbling of urine from peritubal site after a suprapubic cystostomy done outside our hospital. Local abdominal examination showed suprapubic catheter in situ with peritubal dermatitis. X-ray KUB revealed two urinary bladder stones which on open suprapubic cystolithotomy were found to be coexisting primary and secondary bladder stones.

Conclusion: Bladder calculus secondary to suprapubic catheterization is rare but can have serious outcomes. We emphasize the importance of explaining the patient about catheter care at the time of discharge.

Key words: Primary Vesical calculus, Secondary Vesical calculus, BPH, Suprapublic cystostomy.

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INTRODUCTION

Vesical calculi are commonly classified as primary or secondary. Primary vesical calculi are stones which pass from kidney via ureter and lodge in the urinary bladder. On the other hand, secondary vesical calculi are due to bladder outlet obstruction, bladder diverticulum, trauma, catheterization, neurogenic bladder or foreign body.

In the late 19th and early 20th century, patients of bladder outlet obstruction and urinary retention owing to benign prostatic enlargement or urethral strictures catheterized themselves. The absence of aseptic precautions led to “catheter fever”. Guttman introduced the concept of sterile, intermittent catheterization.1 Suprapubic catheterization of the bladder is an alternative to short and long term urethral catheterization.2 Long-term indwelling catheters commonly lead to complications such as bacteriuria, encrustation of the catheter by mineral salts (seen in 40-50% of patients), pericatheter leakage, trauma, stone formation, balloon non-deflation and catheter stuck while removal due to cufing effect of deflated balloons.2,3

Patients who are managed with an indwelling
urethral or a suprapubic catheter have a nine times increased risk of stone formation and those using intermittent catheterization or a condom catheter have a fourfold increased risk for development of a bladder stone compared with patients who were catheter free and had continent bladder control.4 Under alkaline conditions (pH more than 7) minerals get precipitated on the outer surface of the inserted portion of the catheter most commonly at the tip. This causes recurrent blockage in around 40-50% of long-term catheterized cases. This is stressful to patients and costly to the health services.3 Catheter obstruction also results due to precipitated mucus, proteins, crystals, blood clots and bacteria and this incidence increases with the duration of catheterization. Proteus Mirabilis alkalinizes the urine by splitting urea that causes precipitation of crystals. Sometimes these encrustations congregate over the catheter tip and form the nidus for development of a vesical calculus. Increasing fluid intake, acidification of the urine with instilled citric acid or oral mandelic acid, ascorbic acid or cranberry juice, using larger bore catheters and saline irrigation decreases the risk of blockage. Replacing catheters periodically is also employed to prevent blockage.5,6 Coexistence of a primary with secondary bladder calculus has not been reported in literature to date. We report one such case.

CASE PRESENTATION

A 65 year old male presented with complaints of dribbling of urine from peritubal site in the outpatient department. Patient had undergone suprapubic cystostomy one and a half year back for urinary retention due to unsuccessful urethral catheterization. There was history of lower urinary tract symptoms for the last 5 years. On examination his vitals were within normal limits. Abdominal examination revealed a suprapubic catheter in situ with evidence of peritubal dermatitis. Rectal examination was suggestive of BPH (Benign Prostatic Hyperplasia) grade 3. His urine analysis and renal functions were found to be within normal limits. X-ray KUB (Kidney Urinary Bladder) region was done which was suggestive of two stones in the urinary bladder, one around the suprapubic catheter and another posterior to it (Figure 1). Foley urethral catheterisation was tried and was fortunately successful. Thereafter, patient was explored with a standard suprapubic incision for bladder stones. A 5 X 5X 4.3 cm stone was found adhered to the catheter tip. Another stone of 4 X 3.8 X 2.5 cm was found in the posterior wall of bladder. Open suprapubic cystolithotomy was carried out under spinal anaesthesia with retrieval of both the stones with the suprapubic catheter (Figure 2). Urine culture was positive for Escherichia coli but the catheter tip culture was sterile. Postoperative course was uneventful and he was discharged and is now planned for Transurethral Resection of Prostate (TURP) for symptomatic prostatic hyperplasia.

DISCUSSION

Development of bacteriuria in the presence of an indwelling catheter is inevitable and the duration of catheterization is the most important risk factor for the development of bacteriuria which occurs at an incidence of approximately 10% per day of catheterization.7 In the bacteriuriac urinary tract, there are two populations of bacteria: (1) planktonic growth, those bacteria growing in suspension in the urine and (2) biofilm growth (layers of organisms on infected indwelling catheters).8 Bacteria attach to the catheter surface forming a biofilm (usually mixed communities of two or more micro-organisms) and secrete an extra-cellular polysaccharide matrix of bacterial glycocalyces. The host urinary protein and salts complex with this matrix, leading to encrustation of the catheter lumen.2,3 Colonization with urease-producing micro-organisms increases urinary pH (by converting urea into ammonia) which promotes precipitation of struvite (magnesium-ammonium-sulfate), and apatite (calcium-phosphate) crystals resulting in catheter encrustation and bladder stones. Elimination of urease-producing micro-organisms is required for reduction in urinary pH to prevent catheter encrustation. Acidic catheter maintenance solutions (or 'bladder washouts') can be effective in dissolving encrustations, thus reducing the need of frequent catheter change.2,3
Figure 1: Shows an opacity around the shadow of Suprapubic catheter with a smaller opacity lying adjacent on the left.

Figure 2: a) Shows suprapubic as well as in situ Foley’s catheter, b) Shows open suprapubic cystolithotomy, c) Shows both, a primary as well as a secondary vesical calculus.
Some urologists advocate the use of Suprapubic cystostomy (SPC) rather than a urethral catheter to avoid the complications associated with long-term urethral catheters. However, technically, SPC is more demanding and requires specialist assistance when blockage or dislodgement occurs.

Good catheter hygiene, including aseptic catheter insertion and sterile continuous closed drainage systems, is necessary to minimize the introduction of microorganisms into the bladder. The catheter-meatal junction should be cleaned daily with water, but antimicrobial agents should be avoided because they lead to colonization with resistant pathogens. A three-weekly catheter change is advised by some to minimize encrustation. If the catheter is to be retained longer, periodic balloon deflation and reinflation to break overlying encrustations and bladder irrigation with an acidic solution is advised. Indwelling catheters should be avoided and wherever possible intermittent catheterization is a much better option. If an indwelling catheter is required, adequate catheter care should be instituted. In our case, the patient was a neglected elderly and relatives did not seek medical attention despite constant pericatheter overflow consequent to a blocked catheter.

Treatment of vesical calculi has evolved over the years. Earlier “blind” insertion of crushing forceps into the bladder was done. Later open surgical removal became common which was followed by extracorporeal fragmentation. Open surgery has been the best-recommended modality for large stones. In small or medium sized calculi, endosurgical procedures such as optical mechanical cystolithotripsy have an added advantage as these methods can be combined with corrective procedure in the same sitting for bladder outlet obstruction. Kemal et al. in their randomized study concluded that the transurethral nephroscopic removal of bladder stone is fast and effective method compared to endoscopic treatment via cystoscope.

CONCLUSION

This is the first case of coexisting primary and secondary vesical calculus to be reported. Bladder calculus secondary to suprapubic catheterization is rare but can have serious outcomes. ‘Prevention is better than cure’ is what we want to emphasize to our readers. Bladder catheterization should be avoided as far as possible. Aseptic technique should be followed during catheterization and the catheter tip should be cleaned by the patient frequently. Frequent change of catheter can further prevent the formation of secondary calculus. This article advises its readers the importance of explaining the patient about catheter care at the time of discharge.

REFERENCES

Foley’s balloon catheter. *Indian J Urol.* 2010; 26:299–300


