

Vesical stones in females: An underestimated problem in Mosul Province

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Abstract

Objective: Vesical stones may be associated with significant urological symptoms and may reflect more serious underlying urological or systemic problems. The aim of this study is to discuss the trends of vesical stones in women, diagnostic tools, and their management patterns. **Patients & methods:** A cross-spective study of 25 female patients, presented with vesical stones, from the urology department at Al-Jumhoori teaching hospital in Mosul. History, physical examination, laboratory & radiological investigations were performed trying to confirm the diagnosis & look for any possible underlying etiology. Then the treatment modality(open surgery versus endoscopic intervention) was decided with regard to stone(s) size, number, the patients age & facilities available in the center. The results were analyzed accordingly. **Results:** The mean patients age is 31.2 years. They presented with a mix of symptoms that mainly included irritative voiding symptoms, suprapubic pain, & hematuria. Ultrasound was the most sensitive imaging modality used. Primary vesical stone was found in 64% of cases, & secondary stone in 36%. Cystolitholapaxy was the treatment of choice in 64% of patients & cystolithotomy in 36%. **Conclusion:** Female vesical calculi have their on trend of behavior that do differ from what is being found in male patients. They present earlier in life (almost 2/3 before 40years of age), commonly are idiopathic in origin, usually have less acute pattern of presentation as compared to male patients. They can be safely & precisely diagnosed using ultrasound & successfully treated by cystolitholapaxy, although cystolithotomy still have its own indications.

Key words: Female Vesical Stones, Cystolitholapaxy, Cystolithotomy.

Introduction

Vesical stones refer to the presence of stones or calcific materials in the bladder or its substitute that functions as a urinary reservoir. Urinary tract stones have afflicted mankind for many centuries, one of the earliest examples of a urinary calculus was found in the pelvis of a mummified 16 year old boy of predynastic (circa 7000-3100 BC) Egypt(1). At the 19th century, bladder calculi accounted for 80% of urolithiasis in Europe(2), and some historical figures who suffered from vesical calculi include Napoleon Bonaparte, Louis XIV, Sir Isaac Newton, and the anatomist Scarpa (3). Nowadays;

Bladder stones accounts for approximately 5% of all urinary calculi in developed countries (4,5), and most of them are seen in men and usually in those above 50 years of age(6). Unlike vesical stones in men, this problem in females is inadequately addressed and discussed usually as unusual case presentations or stone rarities(7,8). However; no study (up to our modest knowledge) discuss the whole aspects of such underestimated problem. In this study, the trends of vesical stones in females, methods of investigations, and their management patterns were discussed.

Patient & methods

A cross-spective study that was conducted in the urology department at Al-Jumhuri teaching hospital in Mosul, from 1/6/ 2008 to 31/5/2009 in which females with vesical stones were included and their data reviewed. Detailed history and physical examination were obtained for all patients, the data collected included: age, residence, presenting symptom(s), previous history of urinary stone disease, family history, systemic diseases(if any). All patients underwent laboratory investigations including urine analysis (GUE), kidney function test (KFT), hemoglobin & PCV. The imaging studies include ultrasound and plain abdominal X-ray (KUB), IVU done in some patient's. UTIs at presentation were treated with antibiotics to eradicate the infection before any intervention. The treatment modality endoscopic stone removal (cystolitholapaxy) versus open stone removal (cystolithotomy) was decided depending on the stone size, number and/or other factors (especially patient age which is directly correlated to urethral size). All the procedures were performed under general anesthesia (G.A). Intravenous antibiotics (3rd generation cephalosporines) were administered at time of induction of general anesthesia. Operative details regarding those who underwent open procedures include: Pfannenstiel incision and classical cystolithotomy with postoperative indwelling two ways Foley's catheter kept for 5-7 days. While those who underwent endoscopic procedure: the patients were put in lithotomy position, a 21 Fr cystoscope with 30 degree lens used to visualize the stone(s), then a rigid continuous-flow lithotrite used to fragment the stone(s) into smaller fragments after bladder distention using physiologic saline. The small residual fragments are removed using Ellik evacuator. Indwelling two ways urethral Foleys catheter kept overnight.

Result

A 25 females with vesical stones were included in the study. Their age ranged between 2–70 years with mean of 31.2 year(figure-1-).Twenty patients (80%) were referred from urban areas & 5 patients (20%) from rural areas. They presented with mixed symptoms (many of them had more than one complaint at the same time), the commonest presentation was irritative voiding symptoms(table -1-). The duration of symptoms ranged from 2 – 52 weeks with mean of 11.7 weeks. Imaging studies including ultrasound and KUB were done for all patients, Ultrasound examination was diagnostic in all patients , while KUB was positive in 17 patients (68%) only. IVU was done for 5 patients who had associated loin pain and gross hematuria. Imaging studies revealed single stone in 20 patients (80%), & multiple stones in 5 patients (20%), among them one patient had 5 stones and 4 patients had two stones. Maximum stones diameters ranged between 1-12cm (mean 3.28cm). Three patients had "giant stones" with stones weight of more than 100gm (100gm, 120gm and 122gm). Sixteen patients (64%) were treated by cystolitholapaxy and nine patients (36%) were treated by cystolithotomy. Three patients (12%) had additional procedures (other than cystolitholapaxy or cystolithotomy) include removal of foreign bodies (migrated IUCD and missed double J stent) and removal of a big stone from a Ureterocele. The post operative course was uneventful in all patients and discharged well from hospital. In 7 patients (28%) there were obvious causes for stone formation (2ry stones): one patient had migrated intravesical IUCD with encrustation & stone formation around it, other patient had retained piece of Foleys catheter inside the bladder, a 3rd patient had missed double J stent again with encrustation & stone formation over it, the other four patients were known to have neuropathic bladder. One of them had neglected Foleys catheter with shell - like stone over it. Three patients (12%)

Vesical stones in females: An underestimated problem in Mosul Province

had associated synchronous upper tract (renal) stones, all of the patients had negative family history, eight patients (32%) had systemic diseases (diabetes mellitus, hypertension and/or ischemic heart disease).

Discussion

Vesical calculi in general is a disease of adult males who complain of bladder outlet obstruction, they are much less commonly found in female patients due to shorter, wider non tortuous urethra & lower outlet resistance(9). More than 90% of vesical calculi are found in men(6), while the urinary bladder stones in women are usually uncommon and thus an underestimated problem. The percentage of vesical stones in females as compared to vesical stones in general in the nearby middle east countries like Kuwait, Saudi Arabia, and UAE where found to be 9%(10), 3.2%(11), and 3%(12) of all vesical stones respectively. In Africa (Sudan) it is about 7%(13). On the other hand, Takasaki et al found it to be 19.4%(14). Douenias and associates found that 80% of vesical stones occur in patients older than 60 years, and only 2% of patients were females(15). Almost the same trend applied to the endemic bladder calculi where the male-to-female ratio found to be 10:1(9,16). The patients age range between 2-70 years (mean age 31.2 years), more than 70% of the patients were younger than 50 years old and 5 patients (20%) were 5 years old or younger, while in studies where male patients predominate 80% of patients were older than 50 or even 60 years(6,15). In a recent study by Hammad the mean age was 41 years(12). This difference in age of presentation can be explained by that in our study only female patients were included, where as in the previous studies both sexes were included, and the male patients predominate, where the age related bladder outlet obstruction due to prostatic enlargement is the main etiological factor. The main presenting symptoms were irritative urinary symptoms in 56%, suprapubic pain in 32%, and hematuria in 20% of patients.

Acute urinary retention was found in 4% only in our study, while it was found in 67% of the vesical stones patients in a study where 97% of them were males(12). Probably this can be explained again by the sex difference between the two studies where the shorter & wider urethra in female patients means a relatively less outlet resistance in comparison with the male urethra, more over this factor will be exaggerated in older males with prostatic enlargement leading to stone impaction and resultant retention of urine, the other explanation is that in the previous study 60% of the bladder stones diameter was less than 1cm(12) which pass more easily into the urethra, in comparison to 3.28cm mean stone diameter in our study. The mean duration of symptoms was 11.7 weeks, while in other studies it was less than 1 week in 71% of patients(12). This may be related to delay in seeking urologic advice by female patients due to social factors where they may prefer to seek gynecological consultation first, also the lower incidence of acute urinary retention in female patients. Almost all patients had normal renal function test, only one patient presented with impaired renal function due to giant vesical stone causing bilateral hydronephrosis which was corrected after stone removal. Ultrasound was the main diagnostic tool which is proved to be sensitive (detected the stone(s) in all patients), reliable, and safe in women during their child bearing age. 68% of patients had radiopaque stones by KUB, while in other study where KUB was used as the main diagnostic tool, the stones were radiopaque in 93% of cases(12). This difference in the radiopacity might be explained by the differences in the chemical composition of stones in different localities. Single stone was found in 80% of the cases, as compared to 20% with multiple stones, this finding matches with what was found in previous studies on vesical stones in both male & female patients where single stone was commonly encountered & multiple stones were found in 25 - 30% of cases only(3,17). Regarding the stone size, it ranged between 1-12 cm (mean 3.28 cm), three of the patients had giant vesical

Vesical stones in females: An underestimated problem in Mosul Province

stones. In Hammad study , 60% of patients had stone size less than 1 cm in diameter(12). This finding is consistent with the duration of symptoms elapsed before seeking medical advice & probably female patients could have passed their smaller stones spontaneously & kept the bigger stones in! & therefore had a trend of presenting with larger size stones. All but 3 patients had cystoscopic examination prior to surgical intervention, those three patients had giant vesical stones & cystoscopy was technically difficult. Cystoscopic examination is the single most accurate approach to document the presence of a bladder calculi(3). The cystoscopic findings ranged from diffuse erythema to various degrees of trabeculations of the bladder wall, one patient had a migrated intravesical IUCD , other patient had missed piece of Foley's catheter, and another patient had a missed double J ureteric stent that were all remove with the stone(s). Vesical calculi in general can be classified as migrant (formed in the upper tracts, pass into the bladder, and are retained there), primary (idiopathic) where no obvious cause is being found, & secondary calculi which include calculi related to urinary stasis, infection, and foreign bodies in the bladder(3). Endemic bladder stones form in children in the absence of obstruction, local disease, neurologic lesion, or known primary infection, and they remain common in infants and children of lower socioeconomic background in North Africa and the Middle and Far East(18). Vesical stones were primary in 72% of the cases (although 12% of the patients had synchronous renal stones which may indicates the possibility of migrated stones to the bladder from the upper urinary tract) , obvious secondary causes were noticed in 7 patients (28%) only. None of the patients had anti-incontinence surgery which is known to be a risk factor for vesical stone(s) formation(3). Various types of cystolithotomy had been described over the history, early instruments used to remove bladder calculi were both clever and bizarre(19). Sixteen patients (64%) were offered cystolitholapaxy and 9 patients (36%) underwent open

cystolithotomy (five patients are children 2-5 years old were their urethral diameter is too small to accommodate the large caliber of the cystolithtride, other three patients had big stones (4-12 cm in diameter), and one patient had multiple stones ,one of them located within a ureterocele which required open stones removal). Nowadays; the majority of bladder calculi are being treated endoscopically, but treatment strategies may range from chemolysis to open surgery(3). None of our patient offered chemolysis, extracorporeal shock wave lithotripsy (ESWL) or laparoscopic stone removal. In a previous study 97% of vesical stones could be treated endoscopically(12) , but that study involved adults only and the size of the bladder stone was 1 cm or less in more than half of the patients. Moreover cystolitholapaxy is restricted in children by the narrow caliber of the urethra(20). Stone analysis results were not available for all patients; therefore it was not included in the study.

Conclusion:

Vesical stones in females although share many common features with those in male patients. However, they are less common & mostly of idiopathic origin, tend to occur at younger age , presented mainly as irritative voiding symptoms after a prolonged duration, diagnosed best with ultrasound , treated mainly with cystolitholapaxy except in pediatric age group & those with giant & multiple stones. This underestimated problem need a further comprehensive studies in the future.

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Vesical stones in females: An underestimated problem in Mosul Province

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Vesical stones in females: An underestimated problem in Mosul Province

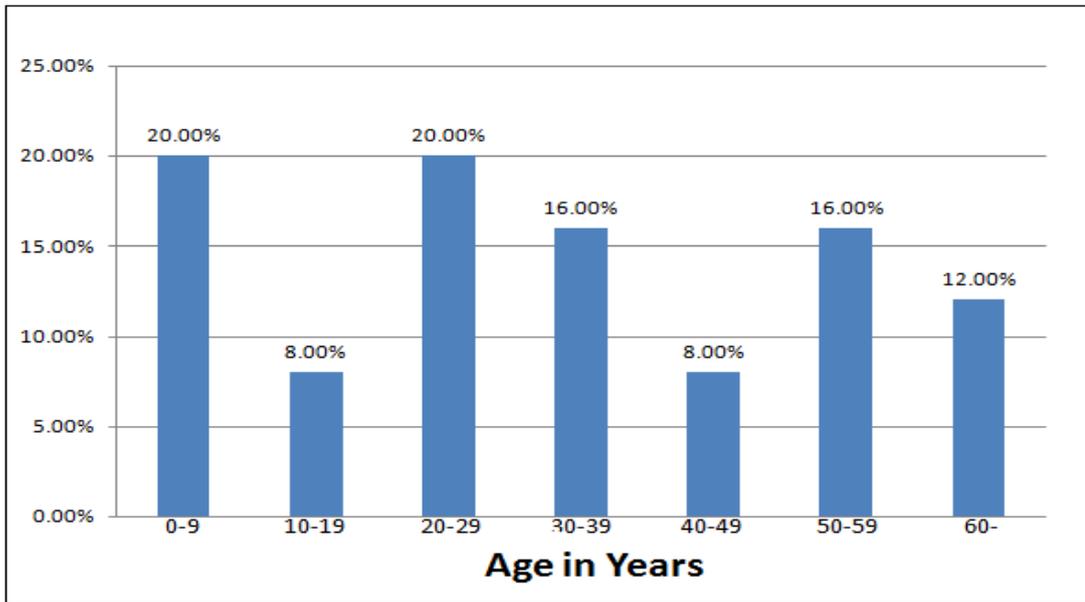


Figure 1: Distribution of female vesical stones in different age groups

Table -1-Patients complaints & their percentages of presentation

Presentation: main complaint	Number of patients	% of patients
irritative symptoms	14	56
suprapubic pain	8	32
Hematuria	5	20
recurrent UTIs	5	20
refractory urine retention	1	4
Uremia	1	4

الخلاصة

الهدف: حصة المثانة البولية لدى الإناث تعتبر قليلة الحدوث نسبياً، والدراسات حولها ليست كثيرة. الغرض من هذه الدراسة هو البحث في طبيعة هذا النوع من الحصى و الفحوصات التي تشخصه وطرق العلاج.

المرضى والطريقة: شملت الدراسة ٢٥ مريضة من مركز جراحة المسالك البولية بمستشفى الجمهوري التعليمي في الموصل، يعانون من حصة المثانة، بعد اخذ التاريخ المرضي واجراء الفحص السريري، اجري لجميع هؤلاء المرضى الفحوصات المختبرية و الشعاعية المطلوبة، ثم تم رفع الحصى بالعمليات الجراحية التقليدية او بواسطة منظار المثانة.

النتائج: تراوحت أعمار المريضات بين ٢ - ٧٠ سنة، وتباينت الاعراض التي شكين منها، وكان التشخيص بالموجات فوق الصوتية الاكثر دقة وحساسية من بين الفحوصات. تم علاج ٦٤% من الحصى بالعمليات المنظارية و ٣٦% عن طريق العمليات التقليدية.

الاستنتاج: حصى المثانة لدى الإناث يختلف عما هو معروف لدى الذكور، حيث انه يوجد في اعمار اصغر، وهو عادة من دون اسباب واضحة، واعراضه اقل حدة مما لدى الذكور، يشخص بدقة باستخدام الامواج فوق الصوتية، و يمكن علاجه في كثير من الحالات بواسطة منظار المثانة.