Bangladesh Journal of Urology

VOLUME 9 | January 2006 | NUMBER 1

CONTENTS

ABSTRACT FROM CURRENT LITERATURE

POST-VOID RESIDUAL URINE VOLUME IN WOMEN WITH OVERACTIVE BLADDER SYMPTOMS.

*MILLEMAN, MARK; LANGENSTROER, PETER *; GURALNICK, MICHAEL L. +++*

Purpose: Most patients with overactive bladder symptoms initially present to their primary care provider for treatment. It is currently recommended that post-void residual urine (PVR) should be measured during the assessment of women complaining of overactive bladder symptoms and anticholinergic medication should be used if PVR is low. However, many primary care providers are reluctant to measure PVR and, therefore, they may delay treatment or even inappropriately treat patients who have a high PVR. We identified clinical factors that are associated with increased PVR that could be used to select which patients are at risk for this.

Materials and Methods: The charts of women presenting to our clinic with complaints of urinary frequency, urgency and/or urge incontinence were retrospectively reviewed. Patient demographics, physical examination and PVR were analyzed to determine if any factor was associated with increased PVR (100 ml or greater).

Results: The charts of 201 patients with complete data were reviewed. Patient age was 20 to 90 years (mean 55). Overall 19% of patients were found to have elevated PVR. Univariate analysis identified that older age, prior incontinence surgery, history of multiple sclerosis, greater American Urological Association Symptom Score, vaginal parity greater than 2, greater pad use and stage 2 or greater vaginal prolapse were associated with elevated PVR. Multivariate analysis identified age older than 55 years, prior incontinence surgery, a history of multiple sclerosis and vaginal prolapse stage 2 or greater as independent predictors of elevated PVR.

Conclusions: It is possible to identify patients with overactive bladder symptoms who are at risk for elevated PVR based on history and physical examination. This could result in fewer patients needing PVR measurement prior to initiating treatment.

Journal of Urology. 172(5, Part 1 of 2):1911-1914, November 2004.

INNOVATIONS IN SHOCK WAVE LITHOTRIPSY TECHNOLOGY: UPDATES IN EXPERIMENTAL STUDIES

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Purpose: We developed innovations in shock wave lithotripsy (SWL) technology.

Materials and Methods: Two technical upgrades were implemented in an original unmodified HM-3 lithotriptor (Dornier Medical Systems, Inc., Kennesaw, Georgia). First, a single unit ellipsoidal reflector insert was used to modify the profile of lithotriptor shock wave (LSW) to decrease the propensity of tissue injury in SWL. Second, a piezoelectric annular array (PEAA) generator (f = 230 kHz and F = 150 mm) was used to produce an auxiliary shock wave of approximately 13 MPa in peak pressure (at 4 kV output voltage) to intensify the collapse of LSW induced bubbles near the target stone for improved comminution efficiency.

Results: Consistent rupture of a vessel phantom made of single cellulose hollow fiber (i.d. = 0.2 mm) was produced after 30 shocks by the original HM-3 reflector at 20 kV. In comparison no vessel rupture could be produced after 200 shocks using the upgraded reflector at 22 kV or the PEAA generator at 4 kV. Using cylindrical BegoStone phantoms (Bego USA, Smithfield, Rhode Island) stone comminution efficiencies (mean +/- sd) after 1,500 shocks produced by the original and upgraded HM-3 reflectors, and the combined PEAA/upgraded HM-3 system, were 81.3% +/- 3.5%, 90.1% +/- 4.3% and 95.2% +/- 3.3%, respectively ($p < 0.05$).

Conclusions: Optimization of the pulse profile and sequence of LSW can significantly improve stone comminution while simultaneously decreasing the propensity of tissue injury during in vitro SWL. This novel concept and associated technologies may be used to upgrade other existing lithotriptors and to design new shock wave lithotriptors for improved performance and safety.

Journal of Urology. 172(5, Part 1 of 2):1892-1898, November 2004.

COMPARISON OF 2 GENERATIONS OF PIEZOELECTRIC LITHOTRIPTORS USING MATCHED PAIR ANALYSIS.

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Purpose: The Piezolith 3000 (Richard Wolf, Knittlingen, Germany) is the newest piezoelectric lithotriptor. Using a matched pair analysis model we compared treatment outcomes of this machine with those of an older generation Piezolith 2300 lithotriptor (Richard Wolf).

Materials and Methods: Patients with solitary, radio-opaque urinary calculi undergoing primary lithotripsy using the Piezolith 3000 were identified. All patients had a 3-month followup. These patients were matched with those from our database treated between 1992 and 1999 with a Piezolith 2300. Patients were initially matched for gender, side and site of the stone. For stones other than those in the lower calix and lower ureter, matching was performed for size in terms of maximum and minimum diameter of the index stone. Additional anatomical factors of caliceal pelvic height and vertical distance of the lower ureteral stone from pubic symphysis were also measured. Thereafter stones with size +/- 1 mm of the index stone were selected and the stone with the best matched anatomical factors was chosen. The initial stone fragmentation rate and stone-free rates at 3 months in the matched pairs were then compared.

Results: A total of 25 matched pairs were found between October 2002 and December 2002. There was no statistical difference between the initial fragmentation rate for the Piezolith 3000 (68%) and the Piezolith 2300 (84%, McNemar's test p = 0.388). The stone-free rate at 3 months for the Piezolith 3000 and the Piezolith 2300 were 36% and 48%, respectively, again with no statistical difference (McNemar's test p = 0.581).

Conclusions: Despite significant design changes and technical modifications, the new piezoelectric lithotriptor does not appear to provide a better treatment outcome than the older generation machine.

Journal of Urology. 172(5, Part 1 of 2):1887-1891, November 2004.

SIMPLE SOLUTION FOR URETHRAL CARUNCLE.

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Purpose: Although urethral caruncle is not a major disease, the technique to remove it has been rather difficult and complicated. We describe a simple method of removal that is comparable to its importance.

Materials and Methods: In 10 patients we applied a ligation technique using 1-zero silk at the base of the urethral caruncle during a 4-year period.

Results: This technique was well tolerated by patients without analgesics or anesthesia. It also allowed obtaining tissue pathological evaluation if wanted. Seven to 14 days after ligation the caruncles broke off without any problem. The caruncles base healed satisfactorily. However, this technique requires at least 1 assistant.

Conclusions: We describe a simple treatment for urethral caruncle.

Journal of Urology. 172(5, Part 1 of 2):1884-1885, November 2004.

Prostate specific antigen progression in men with lymph node metastases following radical prostatectomy: results of long-term follow up.

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Purpose: We examined the clinical outcome of patients with lymph node metastases found at prostatectomy with the goal to identify factors that predict freedom from prostate specific antigen (PSA) progression.

Materials and Methods: We retrospectively reviewed the records of 3,264 consecutive men with clinically localized prostate cancer who underwent extended pelvic lymphadenectomy and radical prostatectomy performed by a single surgeon between April 1982 and March 2003. Patients with pathologically confirmed lymph node metastases and no history of adjuvant treatment were identified. Clinical and histopathological factors were analyzed for an association with time to PSA progression using univariate and multivariable analyses.

Results: Of the 143 patients (4.4% of total) in the study with nodal involvement 24 (16.8%) were free of disease

at last followup (median 6 years). Median time to failure was 2 years with PSA progression occurring as late as 11 years postoperatively in 2 patients. The 5 and 7-year PSA progression free rate in all lymph node positive patients was 26.5% and 10.9%, respectively. A 15% or greater incidence of positive nodes (p = 0.0008) and high prostatectomy Gleason score (ie score 8 to 10, p = 0.008) were independent predictors of PSA progression in multivariate Cox proportional hazards models. Seminal vesicle invasion (HR 1.45, p = 0.063) or positive surgical margins (HR 1.43, p = 0.063) were marginally significant in the multivariate model. The 5-year PSA progression-free rate was 52% in men with less than 15% positive lymph nodes, prostatectomy Gleason score 7 or less and negative seminal vesicle invasion.

Conclusions: While the incidence of lymph node positive disease in patients undergoing radical prostatectomy is infrequent in the PSA era, patients with nodal involvement may experience disease progression as remote as 1 decade after surgery. Pathological factors such as the percent of positive lymph nodes, prostatectomy Gleason score and seminal vesicle invasion appear to predict an increased risk of PSA failure in this population.

Journal of Urology. 172(5, Part 1 of 2):1860-1864, November 2004.

Race is not a predictor of prostate cancer detection on repeat prostate biopsy.

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Purpose: We evaluated men undergoing repeat prostate biopsies for persistently increased serum prostate specific antigen (PSA) levels to determine if race was a predictor of cancer detection.

Materials and Methods: Between July 1995 and June 2002, 401 men had undergone 2 or more transrectal ultrasound guided prostate biopsies at our institutions. Clinical information was gathered using our prostate biopsy database and retrospectively reviewed. Race, age, serum PSA, PSA velocity, total number of biopsies performed, total number of previous negative cores and the presence of high grade prostatic intraepithelial neoplasia (HGPIN) or atypical small acinar proliferation (ASAP) on prior biopsy were evaluated to determine if they were predictors of subsequent cancer detection. Multivariate analysis was performed using a time dependent covariate Cox proportional hazards model.

Results: Of the 401 men undergoing repeat prostate biopsy, 91 (22.7%) were diagnosed with prostate cancer. In total there were 180 (44.9%) black men and 221 (55.1%) white men. Cancer was diagnosed in 49 black men (27.2%) and 42 white men (19.0%, p = 0.06). On multivariate analysis serum PSA, HGPIN, ASAP and PSA velocity were predictors of prostate cancer detection (p = 0.006, <0.0001, 0.001 and 0.0004, respectively). Race was not found to be a predictor of prostate cancer detection on repeat prostate biopsy (p = 0.16). In the evaluation of clinical data for racial differences, black men had a significantly higher incidence of HGPIN on prior biopsy compared to white men (p = 0.02). Serum PSA, PSA velocity, presence of ASAP on prior biopsy, age, number of biopsies performed and number of previous negative cores were not statistically different between black and white men.

Conclusions: Race is not a predictor of prostate cancer detection in men undergoing repeat prostate biopsies. With the exception of HGPIN, all other clinical parameters were similar between black and white men. Serum PSA, PSA velocity, HGPIN and ASAP were found to be significant predictors of subsequent prostate cancer detection.

Journal of Urology. 172(5, Part 1 of 2):1853-1855, November 2004.

Anatomical extent of lymph node dissection: Impact on men with clinically localized prostate cancer

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Purpose: This study evaluates the influence of the anatomical extent of pelvic lymph node dissection performed at radical prostatectomy on lymph node yield, staging accuracy and time to prostate specific antigen progression.

Materials and Methods: Between February 1992 and April 2003, 2 surgeons at 1 hospital performed 2,135 and 1,865 radical prostatectomies with pelvic lymph node dissection, respectively. One surgeon routinely performed an extended lymph node dissection while the second surgeon performed a limited pelvic lymphadenectomy. The number of lymph nodes extracted and the number of patients with positive lymph nodes detected were analyzed and compared. Kaplan-Meier analysis was used to compare the biochemical recurrence-free survival between the 2 groups of patients with occult nodal disease.

Results: Extended lymph node dissection removed more lymph nodes (mean 11.6 vs 8.9, p <0.0001) and detected more lymph node positive disease (3.2% vs 1.1%, p <0.0001) than the more anatomically limited technique. This finding held true for patients across all pathology groups. Among men with lymph node positive disease involving less than 15% of extracted nodes, the 5-year prostate specific antigen progression-free rate for extended lymph node dissection was 43% versus 10% for the more limited lymph node dissection (p = 0.01).

Conclusions: Compared to limited lymph node dissection, extended pelvic lymphadenectomy appears to identify men with positive lymph nodes more frequently. A significant benefit in biochemical recurrence-free survival may exist for certain subgroups undergoing the extended dissection. However, because the results may be influenced by stage migration, longer followup is necessary to determine whether the apparent therapeutic effect persists.

Journal of Urology. 172(5, Part 1 of 2):1840-1844, November 2004.

Impact of surgical delay on long-term cancer control for clinically localized prostate cancer.

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Purpose: Radical retropubic prostatectomy (RRP) as definitive management for clinically localized prostate cancer is commonly performed within months of diagnosis. Despite patient anxiety there is little evidence to suggest that a delay of several months from diagnosis to RRP is associated with a worse cancer control rate. However, a recent study cast doubt on the safety of such a delay with respect to cancer control. Therefore, in a contemporary series we determined long-term cancer control in men who underwent RRP for clinically localized prostate cancer with some treated early and others treated after a longer delay.

Materials and Methods: We analyzed data on 926 men who underwent RRP between January 1989 and December 1994. Age, preoperative serum prostate specific antigen (PSA), biopsy Gleason score, clinical and pathological stage, and biochemical recurrence were compared between 162 men who underwent RRP 60 days or less from biopsy and 764 who underwent RRP after a greater delay. Disease-free (PSA less than 0.2 ng/ml) survival rates were compared using Kaplan-Meier analysis. Pathological staging was compared using logistic regression.

Results: The different groups were well matched for age, serum PSA, pathological stage and followup. However, significantly more men who underwent RRP between 121 and 150 days, and 151 days or greater had T1c disease (48% and 57% vs 35%, p <0.04 and <0.0001, respectively). In addition, significantly more men operated on at 151 days or greater had biopsy Gleason scores 2 to 6 (86% vs 65%, p <0.0001) and significantly fewer had Gleason score 7 disease (13% vs 30%, p <0.002). Men who underwent RRP after 60 or less days had 5 and 10-year biochemical disease-free survival rates comparable to those in men who underwent RRP after 61 to 90, 91 to 120 and 121 to 150 days after diagnosis (82% and 78%, 86% and 78%, 86% and 75%, and 86% and 82%, respectively). Those operated on at 151 days or greater had significantly greater 5 and 10-year biochemical disease-free survival rates (89% and 87%, p <0.04). However, when patients were stratified into different subgroups based on clinical stage, serum PSA and biopsy Gleason score a delay of 150 days or greater no longer impacted differently on long-term cancer control rates.

Conclusions: Delays of up to several months from prostate cancer diagnosis to RRP do not appear to impact long-term biochemical cancer control rates. Therefore, patients can be reassured that there is no immediate urgency to perform RRP after prostate cancer diagnosis, especially in those with T1c disease and biopsy Gleason scores less than 7.

Journal of Urology. 172(5, Part 1 of 2):1835-1839, November 2004.

Watchful Waiting and Health Related Quality Of Life For Patients With Localized Prostate Cancer: Data From Capsure.

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Purpose: Watchful waiting is an alternative to active treatment for men with low risk prostate cancer but it is unclear how health related quality of life (HRQoL) may change over time for men who select this option. We report on HRQoL in men with localized prostate cancer who selected watchful waiting.

Materials and Methods: HRQoL outcomes were reviewed for 310 men diagnosed with prostate cancer from 1990 to 2001 within Cancer of the Prostate Strategic Urological Research Endeavor who chose watchful waiting. The UCLA Prostate Cancer Index and RAND 36-Item Health Survey were completed at enrollment and approximately every 6 months. A random slopes model was developed to assess time trends in HRQoL for up to 5 years after diagnosis, adjusting for age at diagnosis and specific comorbidities.

Results: Significant decreases with time were observed in 7 domains of the RAND 36-Item Health Survey and 4 of the UCLA Prostate Cancer Index scales.

Conclusions: Men with prostate cancer who chose watchful waiting in the current study had better or similar HRQoL outcomes compared to men without prostate cancer at the start of the study. Many of these scores were significantly affected by increasing age and decreased with time. The physical domain scores as well as sexual function scores decreased more than expected from the aging process alone.

Journal of Urology. 172(5, Part 1 of 2):1830-1834, November 2004.

Controversies in prostate cancer screening

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Purpose: Prostate cancer is the most common cancer in men and the second most common cause of cancer death in men, and yet controversy continues to surround the practice of prostate cancer screening. Despite recent studies that have cast doubt over the true efficacy of breast cancer screening programs, the National Cancer Institute continues to support breast cancer screening and it has withheld endorsement of widespread prostate cancer screening. Criticisms of prostate cancer screening include the financial burden of screening, the morbidity of prostate biopsy, the low positive predictive value of screening, the over treatment of an indolent disease and the lack of evidence demonstrating a mortality benefit due to screening.

Materials and Methods: We formulated a comprehensive discussion addressing the criticisms of prostate cancer screening.

Results: In an effort to highlight the importance of prostate cancer screening we noted how concerns regarding cost, morbidity and low positive predictive value are common to widely accepted screening programs for other common malignancies. We also draw attention to the danger of abandoning prostate cancer screening, a practice that is called into question by watchful waiting series and Markov modeling of prostate cancer treatment. Finally, we observed how the implementation of prostate cancer screening in the United States has led to the phenomenon of stage migration and paralleled the decrease in the prostate cancer mortality rate.

Conclusions: The prostate specific antigen era has brought great promise for improving the prognosis of prostate cancer. We must continue to seek support for widespread prostate cancer screening.

Journal of Urology. 172(5, Part 1 of 2):1822-1824, November 2004.

Lymph node involvement in patients with bladder cancer treated with radical cystectomy: a patho-anatomical study-a single center experience.

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Purpose: To our knowledge the extent of lymphadenectomy with cystectomy, the number of lymph nodes to be retrieved and the anatomical groups to be dissected are still undetermined. This study was done to clarify these issues.

Materials and Methods: A total of 200 patients underwent radical cystectomy and extended lymphadenectomy up to the level of origin of the inferior mesenteric artery. Removed tissues were labeled according to anatomical location and sent separately for pathological evaluation. In each group the number and status of lymph nodes were determined. The number of positive nodes was correlated with the number of retrieved nodes. Cases with a single positive node were identified and the anatomical location was defined.

Results: The mean number of retrieved nodes per patient +/- SE was 50.6 +/- 14.4 and 48 (24%) patients had nodal disease. The mean number of positive nodes per involved case was 8.08 +/- 13.2. There was a weak correlation between the number of positive nodes and the number of harvested nodes. Bilateral disease was noted in 39.6% of cases. Single node involvement was observed in 22 cases, of which all except 1 were in the endopelvic region.

Conclusions: There is a sentinel region, which is the endopelvic region (that is the internal iliac and obturator groups of lymph nodes). There are no skipped lesions. Negative nodes in the endopelvic region indicate that more proximal dissection is not necessary. Bilateral endopelvic dissection is mandatory.

Journal of Urology. 172(5, Part 1 of 2):1818-1821, November 2004.

Laparoscopic extended pelvic lymphadenectomy for bladder cancer: technique and initial outcomes.

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Purpose: We describe the technique and our evolving outcomes of laparoscopic extended pelvic lymphadenectomy for bladder cancer.

Materials and Methods: Since 1999 laparoscopic radical cystectomy with pelvic lymphadenectomy and intracorporeal urinary diversion has been performed in 22 patients. The initial 11 patients underwent limited dissection (group 1) and the subsequent 11 consecutive patients underwent extended lymphadenectomy (group 2). Our split-and-roll technique of laparoscopic extended pelvic lymphadenectomy has evolved to achieve lymphatic tissue clearance by bilaterally skeletonizing the genitofemoral nerve, external iliac artery, external iliac vein, obturator nerve, hypogastric artery, common iliac artery and pubic bone.

Results: Extended lymphadenectomy added 1.5 hours of operative time. The median number of nodes retrieved was 3 and 21 in groups 1 and 2, respectively ($p = 0.001$). Three patients per group were found to have positive nodal disease. In 1 patient undergoing extended dissection injury to a deep pelvic vein was managed by intracorporeal suturing and resulted in 200 ml blood loss. Two other patients had deep venous thrombosis. At a mean followup of 11 months (range 2 to 43) there were no port site recurrences.

Conclusions: Laparoscopic extended pelvic lymphadenectomy for bladder cancer can be performed with anatomical boundaries and nodal yields commensurate with those of current recommendations for open surgery.

Journal of Urology. 172(5, Part 1 of 2):1809-1812, November 2004.

IMAGINGS OF URINARY SYSTEM TO FIND ANOMALIES IN CHILDREN HAVING URINARY INFECTION

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Summary :

Objective: To find urinary tract abnormalities in children with UTI by ultrasonography. Methods: 130 patients from 1 year to 14 years of age with culture proven UTI underwent abdominal ultrasonography to see structural abnormalities of urinary tract. A micturating cystourethrogram (MCU) was done in whom abnormalities were found in lower urinary tract on ultrasonography as well as those with recurrent UTI even after normal ultrasonography. IVU and renal isotope scanning were done in selected cases. All the patients were followed up for one year. Result :Thirty four (26.15%) children with urinary tract infections had an underlying structural abnormality, 24(70.58%) of which were picked up by ultrasonography and 10 (29.42%) of them confirmed by MCU. The highest number detected within 4 years of age. Among the patients with anomalies, 26 (20.00%) were male and 8 (6.15%) were female. Major anomalies were hydronephrosis with pelviureteric junction obstruction, vesicoureteric reflux, and posterior urethral valves. Conclusion: An ultrasound of whole abdomen is recommended in all children with first urinary tract infection and in addition a RGU & MCU is also indicated in all patients with UTI and lower urinary tract anomalies because about one-fourth of anomalies will be missed if only ultrasound is done.

Introduction:

Urinary tract infection is an inflammatory response of the urothelium to bacterial invasion that is usually associated with bacteriuria and pyuria[1]. The structural anomalies that cause stasis and vesicoureteral reflux causes repeated infection in urinary tract followed by renal scarring[2]. The age of the patients and presence of underlying structural anomalies of urinary tract are the two main risk factors that determine the renal paranchymal damage. Early diagnosis and treatment of urinary tract infection (UTI) aims to prevent destructions and scarring of renal parenchyma[3].

The aim of this study was to find out the structural abnormalities of the urinary tract in patients with urinary tract infection using ultrasound examination.

Methods:

This was a hospital based prospective study conducted in Bangabandhu Sheik Mujib Medical University (BSMMU) in the department of pediatrics, urology and radiology & imaging from January 2004 to December 2005. Children with culture proven UTI from one year to 14 years of age were included in the study. Patient with other systemic infection and with known anatomical abnormalities were excluded from the study. A mid stream clean catch specimen of urine was collected for culture. UTI was diagnosed when urine microscopy showed >5 pus cell /HPF in a centrifuged sample of urine. Antibiotics were given for 10 days according to C/S report. A repeat urine culture was done two days after stopping the antibiotics to ensure that the infection has cleared. At that time, Ultrasonography (USG) of the kidney, ureter & bladder (KUB) region with post-voidal residue (PVR) was performed by experienced sonologist in radiology department of BSMMU. Micturating Cystourethrogram MCU) was done in those with abnormalities of the lower urinary tract made out on ultrasound as well as in those who had recurrence of infection after normal ultrasound. Intravenous urogram (IVU) was done in cases of anomalies in the Kidney and upper collecting system. In case of impaired renal function, Isotope scanning was done to asses the renal size, function and scarring. It was also done in some of those who needed surgery. Children without established anatomical abnormalities were followed up. Those with anomalies were managed in consultation with urologist. All patients were followed up for 6 months after study both clinically and by urine analysis.

Results:

Among the 130 children with urinary tract infection 107 were males and 23 were female. Age range was 1-14 years. All the children in the study were underwent whole abdomen ultrasonography out of them 34 children of this study detected with urinary tract abnormalities 26 (76.47% of abnormalities) were male and 8 (23.52% of abnormalities) were female and 22 (64.70% of abnormalities) children were 1-4 years of age. Age and Sex

wise distribution of 130 patients with UTI shown in Table-I. All the abnormalities detected by the ultrasound were later confirmed, either by specific investigations or by surgery. Out of 34 patients with abnormalities 24 were picked up solely by ultrasonography and 10 were by MCU. Total 18 patients with anomalies detected either by ultrasonography or with recurrent UTI underwent MCU. Ten patients of them had confirmed to have abnormalities by MCU. Eight of which showed vesico-ureteral reflux, 2 had posterior urethral valve. Diagnosis of 34 patients with structural abnormalities shown in Table-II.

Table-I

Age and Sex wise distribution of 130 patients with UTI

Age in years	Male (Total 107)	Female (Total 23)	Anomalous		% of Anomaly
			Male	Female	
1-4	72	12	18	4	23.40
4-6	16	8	3	3	25.00
6-8	11	2	2	1	23.07
8-10	6	1	2	0	28.57
10-14	2	0	1	0	50.00

Table II

Diagnosis of 34 patients with structural abnormalities

Type of abnormalities	No. of cases
Unilateral hydronephrosis with PUJ obstruction	19
Bilateral Hydro-uretero nephrosis with Posterior urethral vulve	6
Vesico-ureteric reflux (Unilateral)	2
Unilateral Hydronephrosis with ureterocele	2
Hydronephrosis with bladder neck hypertrophy	2
Unilateral Hydronephrosis with agenesis of other kidney	2
Renal stone	1

Discussion:

All children after first urinary tract infection require evaluation with imaging to screen the urinary tract for anatomic and functional abnormalities. Anamolies of the urinary tract predispose to UTI and early detection with management decrease the risk of renal scarring[2]. The choice and number of investigations to be done is however controversial. All forms of urodiagnostic imaging cannot be done in an individual patient. In this study we have taken ultrasonographic examination of whole abdomen as the investigation of choice and MCU as the second modality of investigation in those who had recurrent UTI and ultrasound showed anomalies.

Although UTI can occur even in a normal urinary tract, recurrent infection as well as renal paranchymal damage is more likely in those with an underlying abnormality[4]. In this study 34 (26.15%) of 130 children had detected abnormalities with imaging. Twenty to fifty percent of children with UTI have been reported in literature to have an underlying abnormalities[5]. This figure varies when all modalies of investigations done to screen out any abnormalities in the patients with UTI. Huang *et al* detected anomalies in 46.5% of children when renal ultrasound, MCU, and IVP were done in all cases[6]. Almost all children <2months of age diagnosed to have UTI are reported to have urinary tract anomalies[7]. In this study, hydronephrosis with PUJ obstruction and hydro-uretero nephrosis with posterior urethral valve, vesico-ureteric reflux are occupied about 80% of affected patients. This data is comparable to others already published[8, 9].

The over all incidence of urinary tract infection usually is more in girls , the incidence of an underlying anomalies is higher in boys. In this study, out of 34 patients with urinary tract anomalies, 26 (76.47%) were male and 8 (23.52%) were female. Older age group of patients in this study showed higher percentage of anomalies after first UTI but statistically significant conclusion can not be drawn due to smaller number of patients in older age group as in showed in other study.

The optimal regimen of investigation for children after UTI to detect urinary tract anomalies still controversial. Smellie *et al* recommended that a combination of two investigations like ultrasound and MCU or ultrasound and isotope scanning be done in all patients[10]. Ultrasound is reported to have a sensitivity of 77-80% and a specificity of 97-99% [11]. Some recommended that an ultrasound be done within the first few days of treatment of urinary tract infection. However there are others who believe that if the response to treatment is satisfactory, little risk would be involved in delaying the ultrasound for a few weeks[12].This is because mild VUR may occur as a part of a severe urinary tract infections and may resolve with resolution of infections. The two anomalies that are most likely to be missed on ultrasound are vesicoureteric reflux and posterior urethral valve. The former being episodic is more likely to be missed. In

this study, there were six patients with hydro-uretero nephrosis with posterior urethral valve and two patients with vesico-ureteric reflux were need to confirmed by ultrasonography along with MCU. MCU in some cases was done as a part of IVU series films.The urology section of American Academy of Pediatrics recommended that an MCU be performed in all children with UTI. MCU being an invasive procedure carries an small risk of iatrogenic infection. They recommended Ultrasonography and MCU as the initial investigations in boys below two years with UTI. In al other children MCU can be done more selectively when UTI recurs or if the ultrasound detects a lower urinary tract anomalies[13].

The Dimercaptosuccinic acid (DMSA) renal scan is the best mode of evaluation of renal parenchymal involvement. During the acute infection it can detect focal pyelonephritis and later show renal scar. In this study DMSA were done in few selected cases as a follow up investigations, since a scan during the acute infection dose not predict the development of permanent renal scar[14].

Conclusion:

Imaging evaluation of the urinary tract after the first urinary tract infection is mandatory. Cost and availability being a major factor for our country, so we recommended that a careful ultrasound examination for whole abdomen should be performed in all children with the UTI. In case of lower tract anomalies detected by ultrasound and patients with repeated UTI even after normal ultrasound finding should do a MCU along with ultrasound.

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REVIEW ARTICLE

POSTERIOR URETHRAL VALVES

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Introduction

Background: The first description of posterior urethral valves (PUV) was made more than 80 years ago by Hugh Hampton Young. PUV represents a spectrum of severity, ranging from disease incompatible with postnatal life to that which is minimal and may not manifest until later in life. Treatment of PUV remains a clinical challenge, requiring active management from infancy into adulthood to avoid progressive dysfunction and deterioration of both the upper and lower urinary tracts.

Pathophysiology: During embryogenesis, the most caudal end of the mesonephric duct is absorbed into the primitive cloaca at the site of the future verumontanum in the posterior urethra. In healthy males, the remnants of this process are the posterior urethral folds called plicae colliculi. Abnormally high insertion and fusion of these primitive folds are believed to be the origin of 95% of PUVs, which are called type I PUV. Although Young described a type II PUV, most pediatric urologists believe that these are not obstructing valves but simply hypertrophy of the plicae colliculi in response to a more distal obstruction as observed in types I and/or III PUV. Also described by Young, type III PUV constitutes a septum at the junction of the posterior and anterior urethra instead of a sail-like valve. Type III is believed to originate from incomplete dissolution of the urogenital membrane[1].

PUV represents a spectrum of obstruction severity. The degree of obstruction caused by this abnormality varies considerably depending on the configuration of the obstructive membrane within the urethra. The morbidity of PUV is not limited merely to transient urethral obstruction; however, the congenital obstruction of the urinary tract at a critical time in organogenesis can have a profound and lifelong effect on kidney, ureteral, and bladder function[2,3].

Approximately 10-15% of children undergoing renal transplant have PUV as the cause of renal insufficiency, and approximately one third of patients born with PUV progress to end-stage renal disease (ESRD)[4].

Moreover, children with PUV develop thickened bladder because of increased collagen deposition and muscle hypertrophy within the bladder wall. Hypertrophy and hyperplasia of the detrusor muscle and increases in connective tissue decrease bladder compliance during filling. Bladder emptying occurs with high intravesical pressures, which can be transmitted to the ureters and kidneys. These patients are susceptible to incontinence, infection, and progressive renal damage.

Epidemology: In the US PUV is the most common cause of lower urinary tract obstruction in male neonates; reported incidence is 1 per 8,000 to 1 per 25,000 live births. Approximately 10-15% of children undergoing renal transplant have PUV as the cause of renal insufficiency, and approximately one third of patients born with PUV progress to ESRD. PUV occurs exclusively in males. Diagnosis usually is made before or at birth when a boy is evaluated for antenatal hydronephrosis. Before the era of prenatal sonography, PUV was discovered during evaluation of urinary tract infection (UTI), voiding dysfunction, or renal failure. While rare, adult presentation of PUV has been described in case reports, with symptoms varying from obstructive voiding symptoms to postejaculatory dysuria. In the presonography era, late presentation of PUV was considered a good prognostic sign suggestive of a lesser degree of obstruction[4].

Clinical aspects

History: The widespread use of antenatal ultrasonography and the sophisticated neonatal care available in most developed countries has enabled diagnosis of PUV in many individuals in the prenatal timeframe. Diagnosis usually is made before or at birth when a boy is evaluated for antenatal hydronephrosis. In 1989, Thomas reported that 10% of patients with prenatal hydronephrosis detected by ultrasonography had PUV. Remember that despite widespread use of antenatal ultrasonography, some patients with PUV present later in life. In a 1993 report, Dinneen et al demonstrated the sensitivity of antenatal ultrasonography to be only 45% in detecting PUV in 45 patients who presented when younger than 6 months. Those patients with PUV that is not diagnosed on prenatal ultrasonography and who do not manifest overt urinary pathology are at risk of delayed presentation of PUV. UTI, diurnal enuresis in boys older than 5 years, secondary diurnal enuresis, voiding pain or dysfunction,

and decreased force of stream may indicate the presence of PUV. PUV sometimes is discovered during evaluation of abdominal mass or renal failure. Hydronephrosis or proteinuria found on examination for unrelated conditions may be the first sign of PUV as incidental diagnosis[2,3].

Physical examinations: Most patients have normal findings upon physical examination. When present, abnormal physical findings are the result of severe renal insufficiency. Neonates may present with severe pulmonary distress due to underdevelopment of the lung caused by oligohydramnios. An appropriate volume of amniotic fluid (produced by the kidneys) is necessary for complete and proper branching of the bronchial tree and alveoli. Physical findings can include- Poor fetal breathing movements, Small chest cavity, Abdominal mass (ascites) ,Potter facies, Limb deformities ,Indentation of the knees and elbows due to compression within the uterus. In older children, physical findings can include poor growth, hypertension, and lethargy. An intermittent or weak urinary stream is a nonreliable sign.

Causes: PUV is a congenital obstruction caused by a malformation of the posterior urethra. The significance of this obstruction is dependent on the secondary effects on the bladder, ureters, and kidneys.

Type I PUV: This type of obstruction is believed to be secondary to abnormal insertion and absorption of the most distal aspects of the wolffian ducts during bladder development. In the healthy male, the remnants of these ducts are observed as the plicae colliculi.

Type III PUV: These valves are observed as a membrane in the posterior urethra believed to originate from incomplete canalization between the anterior and posterior urethra.

Differential diagnosis: Other Problems to be Considered- Anterior urethral valves, Urethral stricture disease, Detrusor sphincter dyssynergy, Diurnal urinary incontinence , Pediatric renal insufficiency[2,3]

Workup

Lab Studies:

Serum electrolytes, BUN, creatinine. Immediately following birth, the infant's serum chemistries are the same as the mother's. In utero, the placenta functions as the major blood filter for the fetus, with waste passed on to the mother. Observing serum chemistries for several days to weeks is important to determine the true status of the newborn's renal function. The normal newborn kidney still is undergoing maturation at birth, and infant glomerular filtration rate (GFR) continues to improve during the first several months of life. Because of renal immaturity at birth, the newborn is unable to concentrate urine and is susceptible to dehydration. This defect is exacerbated by associated renal dysplasia that found with PUV. As renal maturation continues, the serum creatinine clearance normally improves. If significant renal dysplasia or damage has occurred, the serum creatinine fails to reach a normal level during the first year of life. Serum creatinine levels greater than 0.8 mg/dL during the first year of life have been demonstrated to be associated with poor long-term renal function.

Imaging Studies:

Renal and bladder sonography-Every child with antenatal hydronephrosis requires renal and bladder sonography performed in the immediate postnatal period. Because newborns commonly have relative hypovolemia during the first few days of life, obtain a repeat sonogram after the first week of life if findings on previous sonography were normal in a child with previously diagnosed antenatal hydronephrosis before making a final determination that the hydronephrosis has resolved.

Voiding cystourethrography-The key to the workup of any child with antenatal hydronephrosis is voiding cystourethrography (VCUG). Perform VCUG during voiding and under fluoroscopy, with imaging of the posterior urethra. The diagnosis of PUV is indicated by visualization of the valve leaflets. Other clues to the diagnosis are a thickened trabeculated bladder, a dilated or elongated posterior urethra, and a hypertrophied bladder neck (Image 1-2). Diverticula, cellules, vesicoureteral reflux, and reflux into the ejaculatory ducts secondary to elevated bladder and urethral pressures also may be present (Image 2).

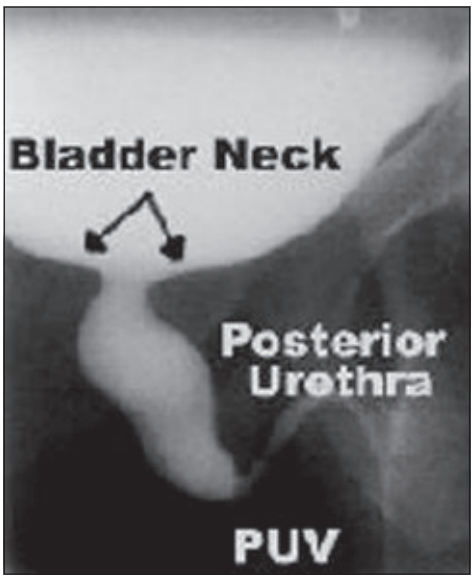

Image-1 : *Posterior urethral valves (PUV). Note hypertrophied bladder neck and dilated posterior urethra proximal to valvena rrowing.*

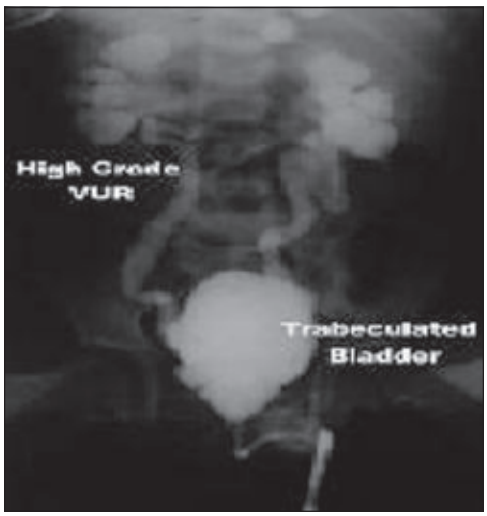

Image-2. *Posterior urethral valves. Note irregular trabeculated bladderand high-grade vesicoureteral reflux (VUR).*

Renal scintigraphy -Although not necessary in every child, renal scintigraphy may be helpful in some cases. If renal dysplasia is suspected, nuclear imaging can determine relative renal function. Some children may have secondary ureterovesical junction obstruction from bladder hypertrophy. Tc-dimercaptosuccinic acid (DMSA), glucoheptonate, and/or mercaptoacetyl triglycine (MAG-3) renal scintigraphy are cortical imaging studies that provide information about relative renal function (each kidney relative to the other) and intrarenal function (eg, photopenic areas within the kidney indicate scarring or dysplasia). Additionally, the MAG-3 renal scan with furosemide (Lasix) provides information about renal drainage and possible obstruction[2].

Other Tests:

Urodynamic studies-Urodynamic evaluation provides information about bladder storage and emptying. The mature bladder should store urine at a low pressure and then empty completely at appropriate pressures.The term “valve bladder” is used to describe patients with PUV and a fibrotic noncompliant bladder. These patients are at risk of developing hydroureteronephrosis, progressive renal deterioration, recurrent infections, and urinary incontinence that persists in school-aged children. Patients with PUV require periodic urodynamic testing throughout childhood because bladder compliance may deteriorate over time.

Procedures:

Cystoscopy serves both diagnostic and therapeutic functions in these infants. Appropriately infant-sized cystoscopes (<8F) are needed to avoid injury to the urethra.

Diagnostic cystoscopy: Confirmation with cystoscopy is required in every child in whom PUV is suggested after VCUG. In some, the filling defect observed on VCUG may represent only external sphincter contraction during voiding. In others, the valve leaflets are confirmed.

Therapeutic cystoscopy (ie, transurethral incision of the PUVs): Multiple techniques have been described for ablating the valves. Disruption of the obstructing membrane by blind passage of a valve hook is now of only historic interest. Currently, valves are disrupted under direct vision by cystoscopy using an endoscopic loop, Bugbee electrocauterization, or laser fulguration. The objective is to relieve the obstruction by cutting the valves at the 12-, 5-, and 7-o’clock positions. It should be performed in the least traumatic fashion to avoid secondary urethral stricture or injury to the urethral sphincter mechanism.

Vesicostomy: In some patients, the urethra may be too small for the available cystoscopic instrumentation. Fortunately, because of continued advancements in pediatric endoscopic equipment, this is an uncommon occurrence. When this situation arises, a temporary vesicostomy is performed.[2,3,4]

Treatment

Medical Care: The medical management of PUV relates to the treatment of the secondary effects of the valves. Adequate care involves a team approach that includes a neonatologist, general pediatrician, pediatric urologist, and pediatric nephrologist. Short-term goals involve treating pulmonary distress, immediate relief of urethral obstruction (placement of 5F feeding tube), and fluid and electrolyte management. In children who survive the pulmonary distress, the long-term issues include treatment of bladder dysfunction and renal insufficiency.
Renal treatment -Newborn period: A minority of patients present with bilateral renal dysplasia at birth. In the past, if patients did not die from associated pulmonary insufficiency, they succumbed to progressive renal insufficiency. With recent advances in peritoneal dialysis, some children may be treated successfully from birth. If growth is adequate, renal transplantation is often possible after the first year of life. *Delayed renal insufficiency*: Approximately one third of patients with PUV progress to ESRD and the need for dialysis or transplantation. Progression of ESRD is accelerated at the time of puberty due to the increased metabolic workload placed on the kidneys. Growth in these children

may be significantly below the accepted norm for the child's age. Adequate caloric intake and protein nutrition are essential to growth but also may accelerate the rise in serum creatinine. Renal dysfunction can be accelerated by recurrent infections and elevated bladder pressures. Treatment of the lower urinary tract may influence progression of upper tract disease. *Bladder management*- Newborn period: All male children with antenatal hydronephrosis require VCUG shortly after birth to exclude PUV. While awaiting this study, place a 5F or 8F urethral catheter to allow for bladder drainage. If valves are confirmed, they can be incised within the first few days of life. However, the newborn urethra may be too small to accommodate available equipment. In these individuals, a vesicostomy can be performed as a temporary solution until urethral growth has been adequate to allow transurethral incision. Secondary ureterovesical junction obstruction from bladder hypertrophy is a controversial issue. Supravesical urinary diversion procedures (eg, cutaneous ureterostomies) generally do not offer better upper tract drainage than standard vesicostomy and, theoretically, may increase bladder dysfunction. Delayed bladder management: Severe or prolonged urethral obstruction can lead to a fibrotic, poorly compliant bladder. This occurs when the developing bladder is exposed to high pressures from urethral obstruction, leading to increases in bladder collagen deposition and detrusor muscle hypertrophy and hyperplasia. These bladders manifest chronically poor compliance, leading to elevated storage pressures. This, in turn, leads to increased susceptibility to UTIs, hydroureteronephrosis, and diurnal urinary incontinence. Use urodynamic testing to assess bladder compliance. Some patients may respond to anticholinergic medication, such as oxybutynin. Institution of intermittent clean catheterization aids some patients in gaining continence and decreasing upper tract hydroureteronephrosis. In patients who do not gain adequate bladder capacity and compliance with these measures, augmentation cystoplasty may be required[5].

Surgical Care: Surgical care of the patient with PUV varies according to age, bladder status, and renal status. *Urinary drainage*- Primary valve ablation: Ideal treatment involves transurethral incision of the PUV during the first few days of life. Current infant resectoscopes are available in size 8F and smaller. The valves can be incised at the 12-, 5-, and 7-o'clock positions with either a cold knife or electrocautery. Some surgeons prefer to leave a catheter in place for 2-3 days after the procedure. The timing of the postoperative VCUG varies and ranges from several days to several months. *Vesicostomy*: When urethral size precludes safe valve ablation, a communicating channel between the bladder and lower abdominal wall (ie, vesicostomy) can be created to provide bladder drainage. Generally, an 18-20F stoma is created approximately midway between the pubis and umbilicus in the midline. Take care to bring the dome of the bladder to the skin and to limit the stomal size to prevent prolapse of bladder urothelium through the vesicostomy. However, formation of too small a stoma results in stomal stenosis and inadequate bladder emptying. *Cutaneous ureterostomies:* Bilateral cutaneous ureterostomies also can be placed to provide for urinary drainage. Techniques for cutaneous ureterostomy include end stomal ureterostomy, loop ureterostomy, Y-ureterostomy (in which the ureter is divided and one end is brought to the skin and the other is reanastomosed in a uretero-ureterostomy), and ring ureterostomy techniques. Potential complications of cutaneous ureterostomies are ureteral devascularization, inadequate drainage, and stomal stenosis. *Augmentation cystoplasty:* Indications for bladder augmentation include inadequately low bladder storage volumes and high bladder pressures despite anticholinergic medication and clean intermittent catheterization. Ileum is used most commonly; however, large bowel, stomach, and ureter also are used, depending on clinical conditions and surgeon preference. Before undertaking the augmentation procedure, seriously consider the ramifications. Undertake augmentation only in patients willing to commit to lifelong intermittent catheterization. The bladder ruptures in approximately 10% of patients. Electrolyte disturbances may be worsened by the placement of intestinal mucosa in contact with urine. Mucus production can be a source of catheter blockage and may be a nidus for stone formation. Finally, the future risk of neoplasia is not yet defined in these patients. Despite these risks, augmentation significantly can improve patient lifestyle and provide for renal protection in selected patients. *Continent appendicovesicostomy:* Also called the Mitrofanoff principle, this procedure involves placement of a nonrefluxing tubular conduit for catheterization between the bladder and skin to provide an alternative channel for catheterization. In children with PUV, institution of intermittent catheterization through a sensate urethra can be difficult. Use of the Mitrofanoff principle provides another channel for catheterization that many patients find more acceptable. The stoma often can be hidden in the umbilicus to provide

acceptable cosmesis. The appendix, ureter, and tubularized bowel can be used for formation of this channel.

Consultations: The child with PUV is best cared for using a team approach. *Pediatrics and neonatology*-The most life-threatening problem in the newborn period is the potential pulmonary hypoplasia related to in utero renal dysfunction. With birth, new metabolic demands are made on the infant kidneys.Urinary stasis and elevated detrusor pressures are risk factors for urosepsis in the newborn. Generally, treatment is coordinated best by establishing a primary pediatrician or pediatric service to coordinate further referrals. Additional pediatric subspecialty consultations often include a neonatal intensivist, a pediatric nephrologist, and a pediatric urologist. *Radiology*-Establishing the diagnosis is a priority in the newborn period. Obtain VCUG with proper views of the posterior urethra. Other required studies include a renal sonography and, at times, renal scintigraphy. *Urology* -In the newborn period, the first treatment intervention is achieving bladder drainage. Catheterization may be difficult or even impossible because of the thickness of the valves or dilation of the posterior urethra with a hypertrophied bladder neck (Image 1). Cystoscopic visualization with incision of the valves should be accomplished in the first few days of life after the child is metabolically stable. After the initial newborn period and successful bladder drainage, either by valve incision or vesicostomy, long-term urologic care is needed. Renal deterioration secondary to progressive bladder dysfunction requires follow-up care with serial renal sonographic and bladder urodynamic studies. Treatment is based on clinical findings, ranging from annual imaging to pharmaceutical management to bladder reconstruction.

Diet: Dietary restrictions depend on renal status. Avoiding progression of renal deterioration while supporting growth requires careful regulation of protein intake, which is best managed under the care of a pediatric nephrologist.In the absence of renal insufficiency, no modification of diet is needed.

Activity: Unless complications such as renal insufficiency occur, activity generally can remain unrestricted. Urinary incontinence may present a social barrier. This often can be managed with anticholinergic therapy with or without clean intermittent catheterization.[6]

Medication

PUV initially represents a surgical condition. However, long-term treatment often comprises a combination of medical and surgical treatment, primarily directed at the bladder. The primary medications involved in bladder management are anticholinergic medications used to improve bladder compliance. Other medications that may be needed include prophylactic antibiotics and medications for management of renal insufficiency.

Anticholinergic agents — Used to improve bladder capacity and compliance in the patient with elevated detrusor pressures leading to hydronephrosis, UTI, or incontinence.Oxybutynin chloride (Ditropan) Hyoscyamine sulfate (Levbid, Levsin) — Tolterodine (Detrol)

Antibiotics — Patients with history of recurrent UTI may benefit from antibiotic prophylaxis, especially in the presence of vesicoureteral reflux. The ideal antibiotic for urinary prophylaxis is safe, effective, inexpensive, and has no adverse effects. Although no antimicrobial is ideal, some are preferred in children. Prophylactic dosage is usually one quarter of the therapeutic dose administered once per day. Too high a dose increases adverse effects (eg, GI upset) and may alter fecal flora. Quinolones commonly are used for prophylaxis and treatment in adults; however, they are inappropriate in children because of their potential arthropathic effect on active growth plates. More appropriate antibiotics in children include trimethoprim (TMP), sulfamethoxazole (SMZ), nitrofurantoin, and amoxicillin.[7]

Follow-Up

PUV is a lifelong disorder that can have a profound effect on the entire urinary tract. As such, patients need periodic long-term urologic follow-up care. The status of the kidneys determines the need for additional specialty follow-up care (eg, with a pediatric nephrologist). Relief of bladder outlet obstruction is the first step in treatment. After incision of the valves, a repeat VCUG or repeat cystoscopy 1-3 months later confirms valve resolution and urethral healing. These patients also may be at risk of subsequent urethral stricture formation; repeat these studies at any point in the future if any recurrent bladder outlet obstruction is indicated. Chronic changes, which can lead to elevated intravesical pressures, may occur in the bladder of patients with PUV. This leads to upper tract changes, urinary incontinence, and recurrent UTI. These patients may need periodic urodynamic studies to determine bladder capacity, compliance, and postvoid residual urine volumes. Patients may have baseline renal dysplasia. Elevated bladder pressures and recurrent UTI further may compromise renal function. Obtain periodic

renal sonography and serum creatinine levels. Severity of the renal and bladder dysfunction determines the frequency of these studies. Approximately one third of patients with PUV have problems with diurnal enuresis when older than 5 years. Diurnal enuresis may be caused by the bladder changes that lead to elevated storage pressures and poor emptying. Rarely, sphincteric dysfunction secondary to valve ablation can be present. Treatment includes anticholinergic medication, intermittent catheterization, and in some patients, bladder augmentation[7,8].

Care

Newborn care-In the newborn with PUV, the first step in treatment is relief of bladder outlet obstruction by placement of a urethral catheter. Cystoscopic valve ablation or vesicostomy then can be performed when the child is stable. Rarely, a urethral catheter cannot be placed because of hypertrophy of the bladder neck (Image 1). These patients require cystoscopy under anesthesia for catheter placement, suprapubic tube placement, or primary vesicostomy. Therefore, care of the newborn is dependent on having adequate instrumentation (eg, pediatric cystoscopic equipment) and expertise (eg, pediatric radiologist, pediatric urologist, pediatric anesthesiologist). If these services are unavailable, place a catheter (if possible) and transfer the child to an appropriate facility. *Care of the older child*- Care of the older child also requires adequate equipment and expertise. Periodic radiologic and urodynamic evaluation is important to monitor the upper urinary tract and bladder changes. These evaluations occur over an extended period of time and rarely constitute an emergency. These patients require a timely referral to a center where appropriate services are available.

Prevention: Because PUV is a congenital anomaly of unknown origin, it is not preventable. Subsequent renal deterioration and bladder changes can be treated and minimized with adequate follow-up care[9].

Complications:

Pulmonary hypoplasia secondary to intrauterine renal dysfunction and oligohydramnios is the primary cause of patient death.Other complications of PUV are generally secondary to chronic bladder changes, leading to elevated detrusor pressures. This, in turn, leads to progressive renal damage, infection, and incontinence. Renal insufficiency -Historically, of those patients with adequate pulmonary function, approximately 25% died of renal insufficiency in the first year of life, 25% died later in childhood, and 50% survived to adulthood with varying degrees of renal function. Today, with the advent of better techniques in the treatment of pediatric renal insufficiency, most of these children can be expected to survive. The goal of treatment is to preserve the maximal obtainable renal function for each patient. This entails aggressive treatment of infections and bladder dysfunction. Vesicoureteral reflux (VUR) commonly is associated with PUV, being present in as many as one third of patients (Image 2). VUR in most children is believed to be due to an insufficient intravesical ureter. When associated with PUV, reflux is generally secondary to elevated intravesical pressures. Therefore, the treatment of VUR in patients with PUV involves treatment of intravesical pressures through anticholinergics, timed voiding, double voiding, intermittent catheterization, and at times, bladder augmentation. Recurrent UTIs are common in patients with PUV. Elevated intravesical pressures predispose patients to infection, possibly by altering urothelial blood flow. Additionally, patients with PUV may have elevated postvoid residual urine volumes, leading to stasis of urine. Dilated upper urinary tracts, with or without VUR, further elevate UTI risk. UTI management is directed at lowering bladder pressures (anticholinergic medication), lowering postvoid residual urine volume (via clean intermittent catheterization), and at times, administering prophylactic antibiotics.The same factors that lead to VUR and UTI also lead to urinary incontinence. Correct management of bladder function depends on adequate bladder evaluation with urodynamic studies. Lowering bladder pressure, improving bladder compliance, and minimizing postvoid residual urine volume contribute to attainment of urinary continence. In some, bladder augmentation may be needed[10].

Prognosis:

The prognosis of children with PUV is improving continually.In the past, most children were found to have PUV only after presenting with urosepsis or progressive renal insufficiency. Older series demonstrated mortality rates approaching 50% by late adolescence. Today, most individuals with PUV are discovered by prenatal sonography exhibiting hydronephrosis. Prompt resolution of bladder obstruction, aggressive treatment of bladder dysfunction, and improved surgical techniques have lowered the neonatal mortality rate to less than 3%. Approximately one third of patients progress to renal insufficiency in their lifetimes. Improved dialysis and transplantation techniques have significantly improved

not only the mortality rate for these children but also their quality of life. Additionally, medical and surgical management can achieve urinary continence in nearly all patients.

Patient Education:

PUV is a lifelong condition requiring continued medical management. Because of this, both the physician and family must understand the potential long-term complication of renal deterioration if bladder function is not treated adequately. Patients and families need realistic expectations regarding continence. While achievable in nearly all of these patients, continence is often dependent upon adherence to a timed voiding schedule and intermittent catheterization. Patients and families also need to realize that medications, such as anticholinergics and suppressive antibiotics, are for control of the symptoms of PUV and are not curative[11].

MISCELLANEOUS

Medical/Legal Pitfalls: Several publications have recently suggested aggressive evaluation of pediatric UTIs. Often, a UTI may be the only sign of significant underlying urologic pathology. While most patients with PUV are identified because of abnormal findings on prenatal sonography, a significant number present later in life with symptoms of UTI or diurnal enuresis recurring or persisting in children older than 5 years. Because of this, the author recommends that any male child older than 5 years with a documented UTI or diurnal enuresis undergo renal and bladder sonography and VCUG. *Special Concerns:* The primary special concerns involved with patients with PUV pertain to the issues of upper urinary tract preservation, UTI, and diurnal urinary incontinence, all of which are secondary to decreased bladder compliance. Remember that PUV is a dynamic disease that can have lifelong effects on the bladder. These patients need long-term follow-up care to monitor and treat the effects of altered bladder compliance[11].

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EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY (ESWL) FOR LARGE RENAL CALCULI: THE ROLE OF URETERAL STENTS

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Summary:

A prospective, comparative, interventional study was undertaken during the period from July 1996 to June 1998 at BSMMU, Dhaka to evaluate the role of ureteral stent during extracorporeal shock wave lithotripsy (ESWL) for large renal calculi. Sixty adults with unilateral large renal calculi (stone burden more than 200 mm^2) were randomized for in situ treatment (n=30) and or the treatment with a prophylactically inserted stent (n=30). A 6 Fr. stent with double-coiled ends was used for stenting and patients were treated with Siemens' "Lithostar plus" third generation lithotriptor. All the patients needed multiple sessions and after 3 months, they were evaluated for the results of treatment and post--ESWL morbidity. The mean (± SD) number of ESWL sessions required was more in stented group of patients than in nonstented group (3.17 ± 0.83 vs 2.50 ± 0.51; p<0.0001) and so were mean (± SD) number of shock waves (1863.33 ± 92.79 vs. 1680.00 ± 71.44; p<0.0001) and mean amount of energy (KV) required (17.21± 0.46 vs. 16.86± 0.40; p<0.05). Post-ESWL morbidity recorded was more in stented group with lower urinary tract symptoms complained by all 30 (100%) patients, fever was noted in 15 (50%) patients, loin pain in 20 (66.7%) patients and ureteral obstruction in 9 (30%) patients. In nonstented group, lower urinary tract symptoms were complained by 10 (33.3%) patients, fever was noted in 9 (30%) patients, loin pain in 9(30%) patients and ureteral obstruction in 6(20%) patients. Overall stone clearance rate at 3 months was 73.3%, 66.7% in stented group and 80% in nonstented group.

Introduction

Stone formation in the kidney is one of the oldest and widespread diseases known to men. Calculi have been found in the tombs of Egyptian mummy dating back to 4000 B.C. and in the graves of north American Indian from 1500 to 1000 B.C. Reference to stone formation was made in early Sanskrit in India between 3000 to 2000 B.C. and stone was recognized in classical time in both Greece and Rome[1]. Renal stone disease is also a very common problem facing the urologists in Bangladesh. In the management of this problem, past decade had witnessed revolutionary changes in this field. Within the relatively short span of time, the treatment of renal disease has moved dramatically from an open operative procedures through minimally invasive percutaneous Endoscopic nephrolithotomy, ultrasonic and electrohydraulic stone disintegration to totally noninvasive technique of extracorporeal shock wave lithotripsy (ESWL)[2]. ESWL has been demonstrated convincingly to be capable of successfully fragmenting human kidney stones. At the beginning of the ESWL era urologists were confined to treating small solitary pelvic or caliceal calculi. Recently the management of staghorn calculi with ESWL has been widely discussed and this anesthesia free treatment, which can be performed on an outpatient basis, has tremendous advantage over invasive treatment [3◦4]. ESWL monotherapy for large renal calculi is a valid initial treatment with regard to the unpredictable excellent results and the noninvasive technique, which allows an alternate procedure to open operation [5]. For stones larger than 3 cm in diameter, percutaneous debulking before ESWL treatment or ESWL with prophylactic ureteral stenting is advocated for successful stone passage and to reduce post-ESWL morbidity. Internal ureteral stents placed before ESWL have an identifiable patient morbidity while indwelling. Therefore they should be used judiciously according to the stone burden, renal anatomy and body habitus[6] . The incidence of ureteral obstruction after ESWL has been shown to be directly related to stone burden. In an effort to decrease the incidence of post-ESWL ureteral obstruction, pain, patient morbidity and retained fragments, ureteral stents are commonly placed before ESWL. They often are left in place for several days to several weeks after ESWL, although the efficacy has not been proved. However some reports note complications that are attributed to indwelling ureteral stents[3,7]. This study attempted to evaluate ESWL as monotherapy for large renal calculi and investigate whether a preoperative ureteral stent is of advantagious to these patients.

Materials and methods:

From July 1996 to June 1998, sixty consecutive patients attending the stone clinic of department of urology with large renal calculi (measuring larger than 200 mm^2) were randomized into 2 groups. One group (n=30) was treated in situ and another group (n=30) was treated after inserting a ureteral stent prophylactically. Patients with stones in some other parts of urinary system, having abnormal renal anatomy or moderate to gross hydronephrosis were not included in this study. Pre-ESWL evaluation included complete blood count, estimation of serum creatinine, blood sugar, coagulation profile, urinalyses including culture. Ultrasonography of KUB region and excretory urography were done to assess kidneys, stones and hydronephrosis. Stone burden was measured on a plain abdominal x-ray in 2 planes one perpendicular to the other. If there was more than one calculus, total stone surface was measured.

A 6 Fr. Double-J round stent with side holes at both ends made of soft polyurethane was used for stenting and patients were treated with Siemens' "Lithostar plus" third generation lithotriptor. All patients randomized for treatment with a stent had their stent placed under general or spinal anesthesia and pain during ESWL sessions were managed with intravenous analgesic and/or sedative. Two to 4 weeks were allowed between ESWL sessions and antimicrobials were continued during the entire course including the intervals between sessions.

Patients were examined at day 1, 15, 30 and 90 after 1st ESWL session at outpatient department for post-ESWL follow-up. Data on complications and stone passage were recorded. Probability of less than 5% ($p<0.05$) was considered significant.

Result:

General data on the patients and the important results are summarized in the table. Patients and treatment received:

Non stented treatment group: Thirteen women and 17 men were treated without stent. Average age was 43.3 (± 8.8) years ranging from 30 to 70 years. Left kidney was more commonly afflicted (56.7%) and the mean stone burden was 279 (± 38) mm^2 (range 220--350 mm^2). Patients in this group needed average 2.5 (± 0.5) sessions of ESWL for satisfactory fragmentation of stone with 1680 shocks per session using 16.86 Kv of energy.

Stent treatment group: Seventeen women and 13 men were treated with stent, placed prophylactically under anesthesia. Average age in this group was 41.6 (± 8.8) years ranging from 23 to 70 years. Left kidney was more commonly afflicted in this group too (53.3%) and the mean stone burden was similar to nonstented group (277 ± 38 mm).

Patients in this group needed 3.2 (± 0.8) sessions of ESWL for satisfactory fragmentation of stone with 1863 shocks per session using 17.21 Kv of energy. Number of sessions needed, number of shockwaves per session and amount of energy required for satisfactory fragmentation of stone were significantly higher for patients in stented group.

Stone clearance and post-ESWL morbidity:

Non stented group: Ten patients in this group complained of lower urinary tract symptoms and fever was recorded in 9 patients after ESWL. During routine follow-up at outpatient department, steinstrasse was seen on a plain abdominal x-ray in 6 patients but all of them passed out the fragments without any intervention and no ureteral obstruction was noted at 3 months. Nine patients complained of intermittent severe pain and renal colic, which were caused by passage of stone debris. Within three months, 24 patients were completely stone free and remaining 6 patients showed residual stone (>5mm) on plain x-ray of KUB region.

Stent treatment group: Despite the Double-J stents, steinstrasse was seen on a plain abdominal x-ray in 9 patients and 2 of them were treated with auxiliary ESWL treatment for the obstructing stone. Lower urinary tract symptoms were complained by all the patients in this group due to passage of stone fragments and constant bladder irritation by indwelling stent. Symptoms disappeared in all patients within 2 weeks of stent removal. Fifteen patients in this group had fever and they were treated with antibiotic according to urine culture. Twenty patients complained of intermittent severe pain and renal colic, which were significantly higher than the nonstented group. Within three months, 20 patients were completely stone free and remaining 10 patients showed residual stone (>5mm) on plain x-ray of KUB region.

Table-I
Results and number of complications in 2 groups of ESWL patients

	With stent (n=30)	Without stent (n=30)	P-value
Age (Yrs): Av ± SD	41.6 ± 9.83	43.27 ± 8.80	>0.05
(Range)	(23-70)	(30-70)	
Stone burden (mm^2)			
	277 ± 37.6	279 ± 37.5	> 0.05
Mean ± SD	>0.05	(Range)	
(Range)	(210-350)	(220-350)	
No. ESWL session			
Mean ± SD	3.17 ± 0.83	2.50 ± 0.51	<0.0001
No. Shock waves			
Mean ± SD	1863.33 ± 92.79	1680,00 ± 71.44	<0.0001
(Range)	(1700-2000)	(1600-1800)	
Energy used (Kv)			
Mean ± SD	17.21 ± 0.46	16.86 ± 0.40	<0.05
(Range)	(16.2-18.4)	(16.2-17.5)	
No. LUTS (%)	30(100)	10(33.3)	<0.0001
No. Loin pain (%)	20 (66.7)	9(30)	<0.05
No. Fever>38C (%)	15(50)	9(30)	>0.05
No. Ureteral obstruction (%)	9(30)	6(20)	>0.05
No. Stone free after 3 months (%)	20 (66.7)	24(80)	>0.05

Discussion:

Ureteral stents are used to provide drainage from the kidney to bladder in different situations, such as, during urinary diversion or ureteral obstruction from stricture or tumor[7,8]. With the widespread use of ESWL there was evidence that the risk of ureteral obstruction after ESWL increased significantly with increasing stone size. Therefore, ureteral stents were proposed to reduce the morbidity of ESWL treatment[9]. However, ureteral stents are not without complications[10].

The introduction of ESWL has revolutionized the management of urinary stone disease. This anesthesia free treatment, which can be performed in an outpatient basis, has tremendous advantages over invasive treatments. ESWL has been successful for the treatment of renal stones with an overall stone free rate of greater than 90% at 2 months[11]. In an effort to decrease the incidence of post-ESWL pain, ureteral obstruction by leading fragments, and to avoid secondary endoscopic procedures and prolonged hospital stay; ureteral stents are commonly placed in patients with large renal calculi before ESWL. Prophylactic ureteral stents before ESWL has been a matter of individual preference based upon the belief and experience of the urologists[3,6]. Others believe that stents are unnecessary, as it is clearly related to the post-ESWL morbidity and do not improve stone passage markedly [10,12]. For treatment of large renal calculi several ESWL sessions are required and large renal calculi may be treated in stages to avoid overwhelming passage of stone debris in the ureter[10]. In this study multiple ESWL sessions were required in both the groups and more sessions were required in stented group, which was statistically significant ($p< 0.0001$). This may be due to presence of a ureteral stent. In the present study, average shock waves required per session were significantly higher in stented (1863) than in nonstented group (1680) similar to the findings by Preminger et al in 1988. They described shock wave power appears to be associated with the size of the stone and the presence of stent; as stone size increased so did the number of shocks administered and more shocks were required to subjects with stents.

Although different studies had shown that the use of stents reduce post-lithotripsy complications, such as colic and may increase the speed of stone fragment passage[6,13], these observations were not supported by

the findings in the current study. In this study, post-ESWL morbidity was more common in stented group than in nonstented group. All patients with stent were symptomatic with frequency and urgency being the most common complaints. Furthermore, there was no statistical difference in the rate of stone free condition at three months between stented and nonstented group. The etiology of these effects is not entirely clear but pressure transmitted to the renal pelvis with urination and trigonal irritation from the intravesical component of the stent are likely factors. The stiffness, length and diameter of the stent may influence the symptoms[11]. ESWL monotherapy requires mechanical fragmentation of stones and biological excretion of fragments. Clinical experience had shown that the stone fragments <4 mm pass successfully in more than 80% of cases[2]. The less than perfect stone-free outcome primarily resulted from failure of spontaneous passage of small particles that usually collect in the gravity dependent caudal calices and refusal by patients to accept the inconvenience, morbidity and economic cost of additional ESWL procedures to pulverize the fragments of more than 5 mm size. So the limiting factors in ESWL monotherapy of large renal stones are the endurance of the patient, the economic burden of multiple procedures and the functional integrity of the collecting system. Stone free rates reported by Eisenberger et al (1987) was 50%, Harada et al (1988) 51%, Pode et al (1988) 44%, Rocco et al (63%), Sohn et al (1988) 30%, Gleeson et al (1989) 43% and Constantinides et al (1989) 85%. Current study showed overall stone clearance rate of 73.3% and it was 66.7% in stented group and 80% in nonstented group of patients with no statistically significant difference between two groups ($p>0.05$). The higher percentage of stone clearance rate in our study may be due to free of charge in subsequent ESWL sessions, favorable anatomy of pelvicalyceal system and timely follow-up. And these results are comparable with the results of other therapeutic modalities to treat large renal stones such as anatrophic nephrolithotomy-94%, PCNL 80.2%[3]. So we conclude that ESWL monotherapy for large renal stones is safe and effective option since it is noninvasive, anesthesia free, requiring minimal hospital stay with excellent stone free rate. Regarding use of stents, they should be used judiciously in situations like patients with solitary kidney or with demonstrable ureteral obstruction, since they do not reduce post-ESWL morbidity and do not contribute to successful stone passage. Moreover, they clearly have morbid effect of their own.

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CASE REPORT

A CASE OF URINARY BLADDER STONE ON COILS OF METALLIC WIRE

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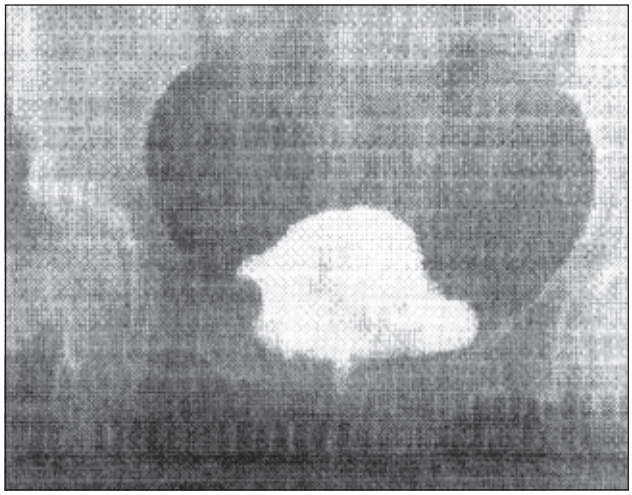
Summary:

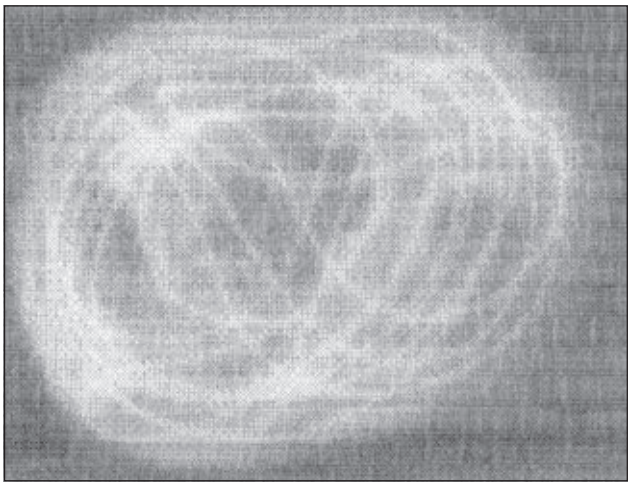
Insertion of urethral or urinary bladder foreign bodies is well recognized. But insertion of metallic wire with delayed presentation with subsequent formation of big urinary bladder stone is very unusual. In this communication one such case is presented with this condition.

Case Report :

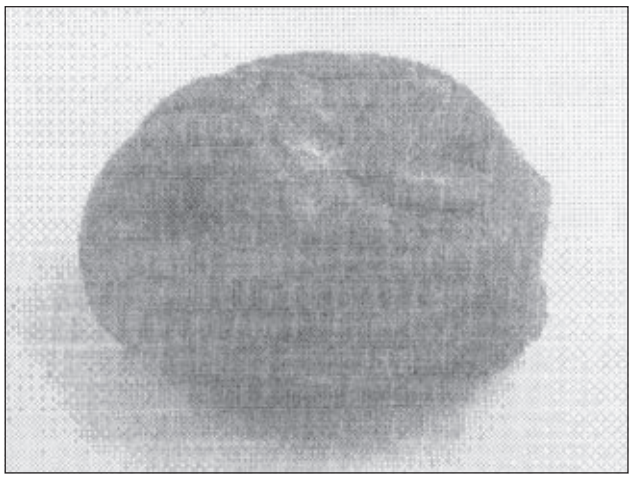
A 16 years old unmarried female patient presented on 7,6.05. with increased frequency of micturition and burning urethral syndrome for 6 months. Physical examination was normal excepting one hard abnormal mass inside the urinary bladder on bi-manual examination. A provisional diagnosis of vesical calculus was made. Plain x-ray KUB reveals calcification over coils of metallic wire. USG reveals an echogenic object casting posterior aquastic shadow inside the urinary bladder over a coil of some thread like structure. The stone was removed by suprapubic cystolithotomy. Postoperative period was uneventful. Measurement of the stone was 55mm x 45mm x 25mm and weight was 50 gram.



Plain X-Ray KUB reveals urinary bladder stone



X-Ray finding of the postoperative specimen of stone



Photograph of post operative specimen of stone

Discussion :

The variety of foreign bodies which have been removed from the urinary bladder is astonishing, e.g. manicure stacks, hairpins and candle wax[1], The presence of such objects in bladder is usually accounted for by urethral masturbation. They may cause several complications like urethral injury, stricture[2]. Why these are introduced?

There are several points to be considered. It is said that some are introduced in the course of inquisitive self-

exploration[4]. They may be introduced as contraceptive devices with the hope that the plugging of urethra will block emission of the ejaculate[4]. They may also be encountered in children and mentally abnormal individuals[5]. There are reports of complications of foreign bodies in the bladder causing injury to urinary bladder and peritonitis[3]. There is report of a paraplegic patient with ill mental condition inserted hairpin in the urethra which was removed by forceps[5]. Self-mutilation commonly is reported among hospitalized emotionally ill patient and incarcerated criminal offenders[6].

In our reports - after repeated questioning with due sympathy - she confessed that- Some of her senior girl friend inserted something in her urethra couple of years back.

Conclusion:

Patients with foreign bodies in urethra or urinary bladder should be dealt with due sympathy.

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OROGINAL ARTICLES

RETROPERITONEOSCOPY FOR TREATMENT OF URETERAL STONES

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Summary

Objective : To assess the efficacy of retroperitoneoscopy in the management of upper ureteral stones. Materials & methods : Between June 2003 to June 2005, 30 cases of large upper ureteric stones were managed by retroperitoneoscopic ureterolithotonry. Age range was 25 to 65 years, 22 (73.33%) were male and 8 (26.66%) were female. Out of 30, 22 (73.33%) cases were with unilateral obstruction. Stone size ranges from 1.25 cm to 6 cm (mean 2 cm).

Through a 1.25 cm lumbar stab incision a space was created by digital dissection. A balloon was introduced into the space and inflated by 700 to 850 ml of air, kept for 5 minutes, then deflated and removed. A 10 mm Hasson trocar for the optics and 2 or 3 additional working port (5 mm) were placed under vision. Ureter was identified and opened over stone by diathermy needle and stone was removed intact putting it in a glove's digit. Ureters were closed by 5/0 vicryl after putting a 6 Fr. D J stent or feeding tube. A drain was placed in retroperitoneum

Results : Successful retroperitonioscopic stone removal was accomplished in 29 (96.66%) cases out of 30. One (3.33%) case needed conversion to open surgery. Operating time ranged from 60 minutes to 140 minutes (mean 90 minutes). Peroperative bleeding was negligible, no transfusion required. Hospital stay 2 to 12 days (mean 3 days). Post operative period was uneventful. Drain removed on 2nd post operative day except in 1 case in which it was kept for 10 days and managed by retrograde DJ stenting. No significant complication was observed in post operative or in follow up period ranging from 3 to 6 months.

Conclusion : Retroperitoneoscopy is an effective, safe and a procedure of low morbidity for selected ureteric calculus.

Introduction :

Recent advancement in ureteroscopic management of ureteral stones with the application of laser lithotripsy and in situ extra corporeal shockwave lithotripsy has made open surgery infrequent for the treatment of ureteral stones. But patients with large impacted proximal ureteral stones still may be a challenge for urologist requiring multiple intervention even open surgery. Use of laparoscopic technique in urology has opened up a therapeutic option for the management of such cases. The laparoscopic ureterolithotomy was initially described by Wickham1 in 1979 and on later in 1990 Gaur-2 popularized the retropritoneoscopic access. The aim of this study was to assess the efficacy of retroperitoneoscopy for the management of upper ureteral stones. The present study showed encouraging outcome of retroperineoscopic ureterlithotomy.

Patients & methods :

Between June 2003 and June 2005, 30 patients with proximal ureteral stones were managed by retroperitoneoscopic ureterolithotomy. Age ranged from 25 to 65 years (mean 35 years). Twenty two (73.33%) patients were male and 8(26.66'%) were female. Twenty two (73.33%) patients presented with lumbar pain, 4(13.33%) had recurrent UTI and 4(1 3.33'%,) were asymptomatic. Excretory urogram showed non visualization and obstructive uropathy in 22 (73.33%) cases and hydroureteronephrosis in 8(26.66%,) cases. USG showed hydronephrosis in all cases. Stones were located on the right side in 18 patients and on the left side in 12 cases and 22(73.33%) cases had stone in upper ureter and 8(26.G6'%,) had mid ureteral stone. Stone size ranged from 1.25 cm to 5 cm (mean 2 cm).

All cases were selected purposively after IVU from urology out patient department of Dhaka Medical College Hospital. The inclusion criteria of cases for this study were location of the stone in proximal ureter (i.e. location above iliac vessels), size of the stone were>1.25 cm, failure of URS and ESWL and the patient signed an informed consent. On the other hand, exclusion criteria were small stone <1.2 cm, stone in distal ureter (below the iliac vessels), patients previously underwent lumbotomy and those who did not give informed consent.

Retroperitoneoscopy was done in all cases as primary procedure. The main indication for laparoscopy were an alternative to open surgery. Because, stone size were too large and URS could not be possible and in obstructed ureter in situ ESWL was not advised.

Retroperitoneoscopy was performed through lumbar approach with initial access by 1.25 cm stab incision below the tip of the 12 rib under general anaesthesia and in lateral position with bridge raised. Then a small retroperitoneal space was created by digital dissection. Then a balloon made of digit of a surgical gloves tied over the tip of a red rubber catheter, was introduced into the space. The balloon was inflated by 700 to 850 ml of air and after 5 min the balloon was deflated and removed. A 10 mm Hasson Trocar for the optics was placed through the initial incision and was fixed to the skin with a pursestring suture in order to avoid air leakage and development of subcutaneous emphysema.

Two additional 5 mm trocars were placed under vision, one in hemiclavicular line just above the iliac spine, another placed posterior to the optic in posterior axillary line, so that a triangle can be made.

The ureter was identified within the retroperitoneal fat taking the psoas major muscle as guideline and dissected upto required level to find out stone by seeing proximal dilation and palpation of stone with laparoscopic forceps. Ureter was opened by diathermy needle and stone was extracted by forceps and removed from cavity through another 10 mm tracher and large stones were placed in a bag made of a surgical gloves and then removed.

Ureteral incision was closed by interrupted 5/0 vicryl suture after placing a DJ stent in 20 cases and 5 Fr. feeding tube in 10 cases. A drain was placed in the retroperitoneum through 5 mm port and was subsequently removed when drainage was less than 5 ml/24 hrs. Stent was removed after 3 weeks.

Results :

Stone removal was successfully accomplished in 29 (96.66%) out of 30 interventions. In one case conversion to open surgery was required due to technical difficulties. Operating time ranged from 60-140 min (mean 90 min), peroperative bleeding was negligible, no transfusion required. Hospital stay ranged from 2-1 2 days (mean 3 days). Retroperitoneal drains were removed after 1 to 3 days, except in one case in which urinary drainage persisted for 12 days and then retrograde D J stenting was done and darinage closed after one day.

All cases were followed up to 3 to 6 months and no ureteral stenosis was found during the period. No other complications were observed.

Discussion :

In this era of endoscopic advancement and ESWL, the rate of open surgery for ureteral stone can not be ignored[2]. Especially large impacted proximal ureteral stones may be a challenge for urologist and may require multiple intervention[4]. In such cases, open surgery still remains good and cost effective option. But advancement of laparoscopy in the field of urology has opened up an alternative avenue for stone management[-5]. In this study the main selection criteria was large impacted proximal ureteral stone that can neither be treated by in situ ESWL nor by rigid ureteroscopy. It is observed, mucosa may grow over the large impacted stone in case of long term impaction and obstruction. In these cases ureteroscopy and intracorporeal lithotripsy may cause perforation of ureter.

Different authors advocated transperitoneal laparoscopic surgery for stone management since it has large working space[5-8]. But traditionally open surgery for stone management is done through retroperitoneal approach as the organs are retroperitoneal. So, we have chosen retroperitoneal laparoscopic access for stone management.

Gaur popularized retroperitoneoscopic approach by using a balloon for space creation in retroperitoneum[2,9]. This approach allows, a fast and direct access to the urinary tract from renal pelvis to the ureter up to the level of the iliac vessels and avoid unusual manipulation and contact of urine with the intraperitoneal organs[4]. The main disadvantage of this approach is smaller working space causes suturing more difficult, but this problem can be overcome by experience and familiarity with laparoscopic suturing technique. Positioning of the working ports may make the procedure easier[4]. Few studies have been done comparing transperitoneal and retroperitoneoscopic laparoscopic procedure as well as with open surgical and further studies required to compare the outcome and advantages of these procedure.

The use of ureteral stent after stone surgery is a controversial issue[10]. But in our series we have stented all the cases either by DJ stent or 5 Fr. feeding tube which reduced the urinary leakage and thus enhanced early discharge from hospital. Presence of ureteral catheter given before surgery made identification of ureter easier in retroperitoneum[4]. But in a separate study, author failed to locate the stone due to the presence of JJ stent[4].

Conclusion :

Retroperitoneoscopy is a safe, fast and easy approach to the urinary tract and can be indicated as an alternative to open surgery for the management of large impacted proximal ureteral stone.

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LAPAROSCOPIC URETEROLITHOTOMY

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Summery:

Purpose of the study is to assess the efficacy of laparoscopic surgery in the treatment of ureteral stones. Laparoscopic Ureterolithotomy was undertaken in 15 patients. 10 were male and 14 were female. The procedure was successful in 5 patients. All patients were discharged within 3-5 days. The procedure appears to be safe and useful. But certain expertise in the field of laparoscopic surgery is necessary as laparoscopic ureteral surgery is technically more demanding. We only recommend this as a last minimal invasive procedure for large and impacted ureteric stone.

Introduction:

In the past two decades there has been unparalleled progress in the surgical treatment of urinary stone disease[1]. Extracorporeal Shock wave Lithotripsy and ureteroscopy with intracorporeal lithotripsy (ICL) solve the great majority of ureteral calculi by minimal invasive technique[2,3,4]. In 1 to 5% of cases classical surgical approach may warrant open surgical procedures[4]. Laparoscopic surgical treatment may be applicable to these cases of pyeloureterolithiasis. It is generally considered as the last minimal invasive alternative prior to the classical surgical treatment and rarely considered as primary treatment option. The first laparoscopic ureterolithotomy was describe by Wickham in 1979[5]. Subsequently, Clayman (1985) performed a percutaneous ureterolithotomy under fluoroscopic control by a nephroscope[6]. But classical transperitoneal laparoscopic ureterolithotomy was described by Raboy et all in 1992[7]. And subsequently Gour et all in 1994 performed retroperitoneal laparoscopic ureterolithotomy[8,9]. Since then it has been practiced throughout the world. Both transperitoneal and intraperioneal approach have been used. Objective of this study is to evaluate the result of our early experience in laparoscopic ureterolithotomy.

Patients and Method:

The study included 15 patients (Ten male and five female) who underwent laparoscopic ureterolithotomy between may 2004 to May 2006 in the National Institute of Kidney Diseases and Urology, Sher-E-Bangla Nagar, Dhaka and in some private hospitals of Dhaka city. Laparoscopic ureterolithotomy was done only when the ureteric stone found unsuitable for removal by ureteroscopy and intracorporeal lithotripsy. 7 patients had upper ureteric calculi and 8 had mid ureteric calculi. Five patients had right ureteric and rest 10 had left ureteric calculi. The mean age was 33 years (Range 25-42). The stone sizes varies from 12mm to 25mm. One patient had appendicectomy by right paramedian incision 15 years ago. All procedures were done transperitonealy. A open ended ureteric catheter was passed in each case up to the stone in lithotomy position before positioning the patient into lateral kidney position. A 10 mm trocar was introduced first by open method in the umbilicus. Pneumoperitoneum was then created. Laparoscope was introduced. Two ports were inserted under direct vision above and below the first port in the mid clavicular line. We used 30º 10 mm laparoscope in all cases. The colon was mobilized by dividing the line of Toldt and reflecting the colon medially. It is optional to introduce another 5mm port in lateral to the 10mm primary working port after colon being mobilized and when additional retraction needed. A dilated ureter was present in all cases and was traced to the calculi which were identified by a palpation with a blunt instrument or with the help of fluroscope. Some times ureter was also identified from below by feeling the stiff ureteric catheter inside. Once the involved ureteral segment containing the calculus has been isolated an endo-babcock forceps was used to secure the ureter above the calculus to avoid the possible cranial migration. The ureter was sharply opened over the stone with a pair of sharp scissors and the stone removed gently from the ureter with a pair of forceps. The stone was removed from the abdomen after putting in a sterile polythene packet or a cut thumb of a sterile glove and then pulled out via a 10mm port. After the stone removal a 6 FR D-J stent with upper curve end cut and then passed the ureter acrossed the ureterotomy site over a guide wire passed retrogradely through the ureteric catheter or passed from above antegradely. The upper end of the D-J stent with curve portion cut was then position across the ureterotomy site with the help of a grasping forceps. Ureterotomy was closed by intracorporeal separate stitches by 5/0 polyglactin suture. A drain was kept through the lateral trocar site and positioned in the paracolic gutter for 24 to 48 hours. Post operative follow up ranges 1 month to 23 months. Stent usually passed urethrally after removal of urethral catheter in three to four days. 3 stents in male patients required endoscopic removal from urethra and bladder. Follow up IVU was done after 8 weeks.

Results:

Out of 15 patients considered, 14 cases were free of stone following laparoscopic intervention. The average

operation time was 110 minutes (range 70 to 180 minutes). No patient required blood transfusion. In one patient it was not possible pass a DJ stent. However no significant postoperative leakage was observed in that particular case. 3 cases developed fever on the 2nd postoperative day lasted for 48 hour settled with broad spectrum antibiotic and paracetamol. No major complication was noted. Urine leak occurred in 1 case and persisted only for 24 hours. All case discharged on 3th to 5th post operative day. No patient required any strong analgesic after 24 hours. Oral feeding started after 24 hours. Patients were able to move out of the bed after 24 hours. So far, 9 patients had postoperative IVU, no stricture or stone fragments were found in any case.

Table-I

Preoperative demographics.

Patients	Age	Sex	Stone size	Site	Location	Indication
Case -1	25	M	14mm	Left	Mid ureter	Impacted stone
Case-2	28	M	18mm	Left	Upper ureter	Impacted stone
Case-3	33	M	16mm	left	Mid ureter	Failed URS and ICPL
Case-4	42	M	25mm	left	Upper ureter	Impacted stone
Case-5	32	F	12mm	left	Upper ureter	Impacted stone
Case-6	37	F	15mm	left	Mid ureter	Impacted stone
Case -7	25	M	16mm	Right	Mid ureter	Impacted stone
Case-8	45	M	18mm	Left	Upper ureter	Impacted stone
Case-9	50	M	16mm	Right	Mid ureter	Failed URS and ICPL
Case-10	43	M	23mm	left	Upper ureter	Impacted stone
Case-11	16	F	12mm	Right	Upper ureter	Impacted stone
Case-12	38	M	15mm	right	Mid ureter	Impacted stone
Case-13	37	M	15mm	left	Mid ureter	Impacted stone
Case -14	25	M	14mm	Right	Mid ureter	Impacted stone
Case-15	45	M	18mm	Left	Upper ureter	Impacted stone

Table-II

Operative and postoperative results

Patients	Procedure	Duration *(In minute)*	Blood Transfusion	Stent placement	Hospital stay (Days)	Complications upmonths	Drain	Follow
Case -1	Stone extraction	180	Not required	Yes	4	None	Yes	23
Case-2	Stone extraction	120	Not required	Yes	4	None	Yes	22
Case-3	Stone extraction	130	Not required	Yes	3	None	Yes	21
Case-4	Stone extraction	120	Not required	No	5	Urine leak for 24 hours	Yes	20
Case-5	Stone extraction	70	Not required	Yes	4	Failed procedure (upward stone migration)	No	
Case-6	Stone extraction	140	Not required	Yes	3	Pyrexia (UTI)	Yes	18
Case -7	Stone extraction	90	Not required	Yes	5	None	Yes	17
Case-8	Stone extraction	120	Not required	Yes	4	None	No	
Case-9	Stone extraction	120	Not required	Yes	5	None	Yes	15
Case-10	Stone extraction	85	Not required	No	3	None	Yes	12
Case-11	Stone extraction	90	Not required	Yes	4	Pyrexia	yes	8
Case -12	Stone extraction	100	Not required	Yes	5	None	Yes	6
Case-13	Stone extraction	125	Not required	Yes	4	None	Yes	5
Case-14	Stone extraction	80	Not required	Yes	3	None	Yes	4
Case-15	Stone extraction	90	Not required	Yes	4	Pyrexia	yes	1

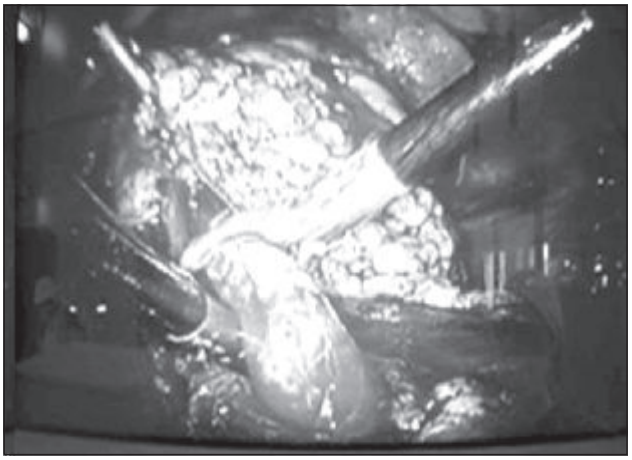

Fig 1: *Laroscopic mobilization ureter with impacted stone*

Fig 2 : *Plain Flim shows large ureteric stone*

Discussion: Minimum invasive techniques have almost replaced the open surgical procedure for the treatment of urolithiasis. Ureterorenoscopy with ICL, ESWL and percutaneous nephrolithoomy (PCNL) have decreased the morbidity of treating urinary calculi. However patient may still need open surgery for ureteric stone, when the stone is large and impacted, failed from other noninvasive method or who need simultaneous treatment for other urinary tract pathology. Laparoscopic surgery is an addition to the minimum invasive procedures in these situations. Advancement of laparoscopic surgery in the last decade made it possible to do different reconstructive surgery and laparoscopic stone removal possible[10,11,12]. Several investigators demonstrated the feasibility of this procedure.

Traditionally, the open surgery has been done by retroperitoneal route. But both transperitoneal or retroperitoneal approach but has been used for laparoscopic approach[7,8,9,13]. All of our operations were done by transperitoneal route. We found it easier with large working space. At the beginning we started with retroperitoneal approach we found it difficult to maneuver the instrument in the small space we converted that to transperitoneal one. Several investigators have mixed success with complete extraperitoneal approach. Gaur found difficulty to close the pyelotomy site by retroperitoneal route due to limited working space[14]. And prolonged urinary leakage 7 to 15 days had occurred in some of his patients. Harewood et all and Micali et all found the procedure easier to do by transperitoneal approach[12,15].

As with any ureteric stone surgery, stone migration can occur in laparoscopic ureterolithotomy so proximal control with a sling or endo babcock is essential in each case. Migration occurred in one of our case.

Identification of ureter may be difficult. We felt difficulty at the beginning. However, after 3 procedures it became relatively easy. We took psoas muscle as a landmark and looked for the ureter on its medical aspect. As we selected only case with large and impacted stones, we felt the stone with the tip of the grasping forcep. It has been suggested that fluoroscopy can be used intraoperatively for ureteric stone localization[15]. We also used fluoroscope in last 7 cases and found it easier to localize the stone. Initially we selected cases on the left side. But latter on we found no difficulty to find and safeguard IVC on the right side.

Urine gushed into the paracolic gutter after reliving the obstruction of the ureter but we rapidly sucked it out and after the procedure we always kept a drain. And none of our case developed any features of peritonitis.

Many others do not recommend laparoscopic surgery in case with previous abdominal surgery[16]. But one of our cases had previous appendicectomy by right paramedian incision. However, we did not find any

difficulty to remove his left ureteric stone by transperitoneal laparoscopic approach.

Conclusion:

Laparoscopic ureterolithtomy is a safe procedure for removing large and impacted ureteric stone alternative to open surgery. In all patients, laparoscopic stone removal resulted in a stone free status in a single procedure. But it should not be taken as primary treatment procedure for ueterolithiasis. It should be considered as last minimum invasive procedure before proceeding to classical open surgery.

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EDITORIAL

SKILL DEVELOPMENT OF YOUNGER UROLOGISTS IN BANGLADESH

Urology has undergone tremendous changes world wide in recent years. Advanced counties are enjoying extraordinary high technological development of minimally invasive surgery in the field of stone disease, reconstructive urology and urological malignancies. These developments have led to precision work with minimal complication. The wave of development has also reached our country. No other specialty has grown so much as urology in Bangladesh in recent years. Increased number of qualified urologists with available newer technology have made this changes possible.

Newer technology has got a variable learning curve depending on availability and quality of teaching facilities, equipments and moreover the attitude and talent of learners. The large academic institutes, in spite of their limitations, are producing a good number of specialists, who are mostly working in the peripheral medical college hospitals and private hospitals. They have got the responsibility to serve with utmost safety and at the same time develop themselves towards perfection. Several International conferences, workshops etc. have been arranged, by which, our urologists have become familiar with the newer technology. Moreover, they are traveling foreign countries to attend conferences, short and long training programmes.

The urologists in Bangladesh have been practicing various endourological procedures since long. Having been started initially in central academic institutes, the procedures like transurethral surgery of urethra, prostate and bladder and ureteroscopic stone fragmentation are now commonly performed not only in urology department of peripheral Medical College hospitals but also in the service giving private hospitals. The technically demanding procedures like ESWL, PCNL etc. Which need large installations, are done in developed centers of big cities. The others, which can be done with portable equipments, are regularly done by young roaming urologists even in the peripheral hospitals with low cost. There may be some compromise in doing such procedures if a strict academic protocol is considered, however, our roaming urologists are doing these with utmost safety and success with a minimum costs and complications. People are becoming oriented now with the minimal invasive procedures related to urology.

Improved technology, skilled man power, positive attitude of health service providers to develop and popularize newer technology and finally extension of helping attitude to the less privileged group of rural areas- all these would be able to provide not only service to the people, but also opportunity in skill development of our younger urologists.

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