OUTCOME OF UPPER URETERIC STONE MANAGEMENT BY SEMIRIGID URETERORENOSCOPE AND INTRACORPOREAL PNEUMATIC LITHOTRIPSY.

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Abstract:

Objective: *To evaluate the outcome of upper ureteric stone management using semirigid URS + ICPL.*

Materials and Methods: *Patients undergoing URS + ICPL in patient department were included in the study. Total 38 patient were included in the study from March 2009 to June 2010 in National Institute of Kidney diseases & Urology, Dhaka. Stone size was 8 mm to 1.5 cm, patients were with good renal function, well excreation on both side, without any distal obstruction, infection or multiple ureteric calculi.*

The procedure was done under SAB.Cystoscopy was done for identification of ureteric orifice and guide wire was passed within ureteric orifice under visual monitoring.46 cm 10 Fr Storz Uretroscope was advanced next to the guide wire.At time a tortuous portion of the ureter was encountered a second guide wire was helpful.

As soon as the stone was seen the pneymatic probe was pushed toward the stone.After fixing to the stone, pneumatic source was on and stone fragmentation was started. Care was taken to avoid injury of the ureter and keeping eye one stone fragment migration within the ureter was achieved. Placement of D-J stent was done at the conclusion of the procedure in most of the cases

Result: *The patients were followed upto 3 months post-operatively. Within immediate complications fever occured in 10 (26.3%) patients, severe haematurea occured in 8 (21.3%) patients, ureteral injury in 8 (21.3%) & ureteric perforation in 2 (4.8%) patients underwent URS+ ICPL. Stone clearance rate after 01 month of intervention was 30 (78.9%). Almost half of the patients developed UTI after 01 month of intervention. Pyelonephritis occured in 2 (4.8%) patient in this group. After 03 months of intervention 84.2% patients exibited complete clearance of stone. Only 02 (4.8%) patients developed ureteric stricture.*

Conclusion: *For management of selective sized upper ureteric stone ureterorenoscopy with semirigid one using pneumatic source of energy is a good option for it's high stone clearance & resonably low complications.*

Key Words: *Upper ureter, URS, ICPL, Stone clearance.*

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Introduction:

Ureteric stone disease is a common urological problem throughout the world. Over last two decades management of urinary stone disease has radically been changed. Open surgery has been replaced by minimally invasive & non invasive procedures like ESWL & URS with Lithotripsy ESWL & URS are currently accepted treatment modalities for upper ureteric calculi. There is controversy as to which form of therapy is better suited for the management. Some authors favour ESWL[1] while others prefer URS[2].

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Improvement in the ureteroscopic equipments has increased emphasis on the need for appropriate miniaturized & effective intracorporeal lithotripsy devices. Semirigid ureteroscope is primarily utilized in the distal ureter[3]. But in our country we frequently use semirigid ureteroscope for dealing upper ureteric stone in selective patient.

Stone clearance rate is superior in case of Holmium: YAG laser lithotripsy and ultrasonic lithotripsy. But this technique is not available in all the centres of our country. Many comparative studies between ESWL & laser lithotripsy for the management of upper ureteric stone has been undertaken in different parts of the world. In most of our set up we are frequently using semirigid ureterorenoscope along with pneumatic lithotripsy as energy source.

Materials & Methods:

Present study was a prospective observational study, conducted in department of urology, National Institute of Kidney diseases and urology, Dhaka. Over a period of 16 months from March 2009 to June 2010. Patients admitted with upper ureteric stone were the candidate of URS, ICPL. The eligibility criteria of the study population were: Good renal function, well excreation on both sides, Stone size 8 mm – 1.5 cm, without any distal obstruction. And Exclusion Criteria: Stone with infection, Multiple ureteric calculi, Bleeding disorder, pregnancy, Renal failure, Impacted stone, Diabetes & other co-morbidities .Total 38 patients were included in this study consecutively.

Result:

Stone size of the patients demonstrated that the average surface area of stone was .92 sq-cm. According to size 36 (94.7%) patients were with stone < 1 cm & 2 (5.3%) patients were with stone > 1 cm size.

Table – I

Distribution of cases according to the size of stone:

Stone size	Pneumatic Lithotripsy
<1 cm	2(5.3%)
>1 cm	36(94.7%)

Stone clearance were (<1 cm size) 2 (100%) patients had incomplete clerance but (>1 cm size) 30 (83.3%) patient had complete clearance but 6 (16.7%) had incomplete clearance.

Table-II

Stone clearance according to the size :

Stone size	Yes	No
<1 cm	2(100%)	0(0.0%)
>1 cm	30(83.3%)	6(16.7%)

Within immediate complications fever occured in 10 (26.3%) patients, severe haematura occured in 8 (21.3%) patients in pneumatic lithotripsy group. Ureteral injury occured in 8 (21.3%) & ureteral perforation occured in 2 (4.8%) patients. Stone migration occurred in 10 (26.3%) patients.

Table-III

Immediate complications following procedure:

Fever	10(26.3%)
Severe haematurea	8(21.3%)
Ureteral injury	8(21.3%)
Stone migration	10(26.3%)
Ureteral perforation	2(4.8%)

(Ureteral injury means mucosal abrasion& Ureteral perforation means through and through injury)

Complete stone clearance was achieved after 01 month of intervention in 30 (78.9%) patients. No patients developed steinstrassae. UTI developed in 22 (57.9%) patients & pyelonephritis in 2 (4.8%) patients.

Table-IV

Outcome 1 month after intervention:

Stone clearance	30(78.9%)
UTI	22(57.9%)
Pyelonephritis	2(4.8%)

Complete stone clearance after 3 months of intervention was 32 (84.2%) patients and 2 patients (4.8%) developed stricture.

Table-V

Outcome 3 months after intervention:

Stone clearance	32(84.2%)
stricture	2(4.8%)

Discussion:

The present study has been designed to assess the efficacy and safety of URS & pneumatic lithotripsy for the management of upper ureteric calculi.

All the cases were included purposively from the post procedural cases following URS ICPL.

Stone size were observed in my this study was almost .92 ± .22 sq.cm. (4) described in their study that stone size was 17.9 ± 3.9 mm. In another study conducted by[5] the size was 10.2 mm.

Immediate complication of the procedure in my study was fever 10 (26.3%) & severe haematurea 8 (21.3%). Ureteral injury occured in 8 (21.3%) & ureteral perforation occured in 2 (4.8%) patients. Stone migration occured in 10 (26.3%) patients.

In a study total 40 patients were enrolled. 02 patients were excluded from the study due to open surgical conversion. It was a comparative study & in URSL group there were 39 patients. In this study immediate complications were ureteric injury 5/39, Perforation 2/39 or sepsis 1/39[6].

In another study out of 197 patients with 10-15 mm upper ureteric stone URSL was conducted using a 7 Fr & 8.9 Fr semirigid ureterorenoscope & pneumatic lithotripsy were used. Here major complications were ureteric injury 3/40 or perforation 2/40 or urosepsis 2/40[7].

Stone clearance rate in a multicentered review study where different treatment catagories were used was 81%, 87% and 57% for push back, by pass and insitu ESWL group. And for URS it was 74%[8].

To compare the success rate, cost effectiveness and efficacy of ureteroscopy and ESWL for treating upper ueteric stone, out of 109 patient 91% were made stone free.[9]

The efficacy,safety and cost effectiveness of ureteroscopic pneumatic lithotripsy with ESWL for proximal ureteric stone 220 patient were enrolled in the study. Stone free rate with semirigid ureteroscope was 83.2%.[6]

Stone clearance after 01 month of intervention in the present study was 30 (78.9%). But after 03 months clearance rate was 32 (84.2%).

In a prospective randomized trial a total 42 patients with a solitary 15 mm or more upper ureteric stone were dealt with. Out of 20 patients 7 (35%) were stone free after the intervention. 8 patients underwent auxiliary ESWL for residual renal (upward migration) or ureteral stone. Two patients were converted to open ureterolithotomy immediately because of ureteral perforation in 01 & an inaccessible stone in the other.[4]

In another review work the records of 112 patients with upper ureteric calculi were retrospectively reviewed. 70 patients were in endoscopic lithotripsy group. Stone clearance rate was 95% & 97% after 01 month & after 3 months of the intervention[5].

Conclusion:

Considering the outcome it is seen that the clinical outcome of upper ureteric stone management by URS ICPL is a good option among other minimally invasive / non invasive procedures considering it's greater stone clearance & less invasiveness.

Conflict of Interest : None Declared

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Abbreviations:

URS : Ureteroneroscopy
ICPL : Intracorporeal Pneumatic Lithotripsy
ESWL: Extracorporeal Shortwave lithotripsy