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Research Article

**A STUDY TO DETERMINE THE SAFETY AND EFFICACY OF
PATIENTS UNDERGOING URETEROSCOPIC LITHOTRIPSY**¹Dr Tasneem Naqvi, ²Dr Arfa Saleem, ³Dr Nadia Rasheed¹Rural Health Center Chung Lahore, ²Saidu Medical College, ³Jinnah Hospital Lahore

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Abstract:

Objective: To determine the safety and efficacy of the patients undergoing ureteroscopic lithotripsy – a surgical procedure.

Methodology: The study was carried out in Jinnah Hospital Lahore and the duration of this study was from December 2019 to December 2020. The patients under discussion were from both genders. The subjects' routine medical exam, laboratory tests, blood pictures, ultra-sounds and x-rays were collected and patients with ureters stone of 1.5cm or less were segregated for the study. The Semi-rigid Ureteroscopic (6.0) with Swiss Lithoclast lithotripter was used.

Results: A sample of 320 patients was selected according to inclusion criteria. Female and male ratio was 1:1.6 and average age value for the sample was calculated as 30.5 year. The stone diameters were averagely 1.2 cm. In 95% cases (n=304), the procedures yielded outstanding results. The stones were broken and crushed successfully. In remaining 16 cases (5%), the procedure was postponed. Among them, 3% cases were due to the reason that ureteroscope could not locate the exact position of the stones whereas in 2% cases JJ stent were used where the stones floated up I the kidney ($p < 0.05$). The operative and post-operative complications such as simple mucosal injury, minor bleeding urinary tract infection persisting haematuria were noted in the subjects. The surgery time was less than one hour in all cases and ranged from 22 to 55 minutes. Except the patients with post-operative complications, rests were discharged from the hospitals within 24 hours of operation. Post operation visits till 3rd week demonstrated the stone residual pieces only in 6 patients.

Conclusion: In spite of the fact that our study has yielded encouraging results for ureteroscope lithotripsy with merely a day at hospital but is subordinate on numerous possibly changeable and process-related components.

Key Words: Mucosal Injury, Ureteroscopy, Kidney, Urine, Therapies, Lithoclast

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INTRODUCTION:

The Primary stones are formed at kidneys and then trapped in the ureter pipe during the urine passage. The symptoms and the indications become very clear at this stage. These, ureteral stones are held responsible for 20% of urolithiasis. Most of the stones (70%) are located in lower 3rd part of the ureter and are known as distal ureteral stones. Due to development in technology various modes of treatment for ureteral stone are available naming conservative, non-invasive extra-corporeal shock wave lithotripsy (ESWL), minimal invasive Uretero-rensoscopy etc [1]. To choose the best among the available techniques, the one less invasive and producing successful ramifications should be selected. Smaller stones of 4 – 8 mm diameter are recommended for spontaneous passage by applying different therapies such as Expectant Therapy with medicine and water or MET (Medical Expulsive Therapy). Open surgery techniques were applied when the size of the stone is bigger or multiple stones are present in ureters. These cannot be separately treated with URS and ESWL [2].

ESWL and URS with Lithoclast are the options of choice when non-invasive or minimum invasive techniques are required. ESWL is best known for renal stones but its limitations are obvious for ureteral stones. During last thirty years, much advancement in this field has been made. Endoscopy management was popular in old days. Fluoroscope was being used for this purpose but now ureter scope has replaced the fluoroscope. Its design has been updated. Optical techniques for better visual analysis have evolved. Flexible ureter scopes have been developed which are being used for endoscopy of upper ureteral tract stones. Uretero-rensoscopy is famous in world nowadays for diagnosis as well as treatment of ureteral and renal stones [3]. Most of the subjects in our set-up were from rural and remote areas where sufficient health care facilities were missing. Our study aimed at the ureteroscopic lithotripsy of patients having stones of 1.5 cm or less diameter and to judge the patients' safety and efficacy of procedure during the procedure.

MATERIAL AND METHODS:

The study was carried out in Jinnah Hospital Lahore and the duration of this study was from December 2019 to December 2020. The contributing factors

were divided into three categories. Patient Factors; These were related to patient history, clinical urine exams such as intravenous urography, urine culture and urine analysis. The patients selected were admitted on the day of procedure. The subjects with heart and blood pressure problems were referred to cardiologist & anesthetist before operation. Patients under 12 years of age and having morbidities such as diabetic mellitus, heart diseases and pregnant cases were excluded from the study. Structural and Process Factors; These factors involve suitability in hospital, availability of bed, facilities available at operation theatre and operating time.

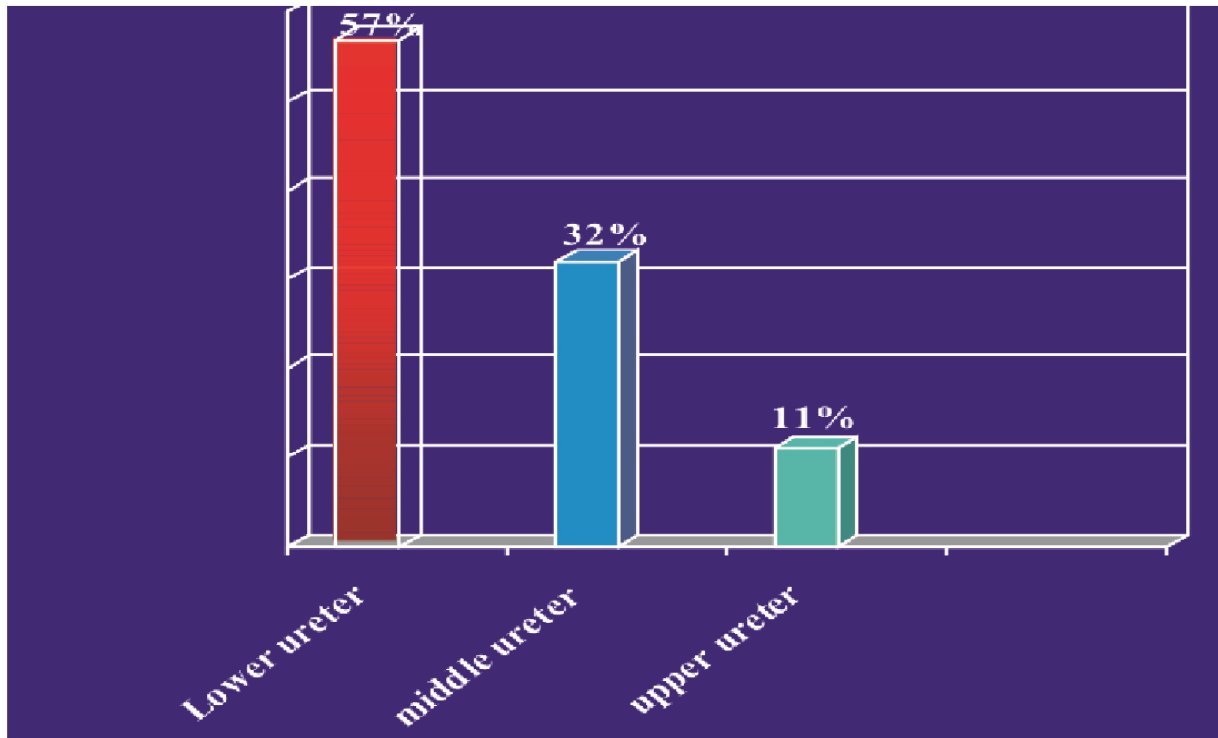
Emotional and Financial Factors; The patients were investigated about how they feel during their stay at hospital, doctors' behavior, attention, their feelings before and after the procedure. The financial impact of the procedure was also discussed with the subjects [4]. Patients undergoing the procedure were given anesthesia. Antibiotics were given prior to operation procedure in all cases. A flexible ureteroscope 6.0 Fr (Karl Storz, Germany) and Swiss lithotripter were utilized. Initial inspection was carried out through ureteral opening. Dilatation was required at a later stage which was done by ureteral catheter and balloon. A minimum quantity of irrigation liquid (0.9 Glycine) was used and ureteroscope was passed to the stone. Extreme care was taken to avoid the stone to float back to kidney. Other infusions were given to keep the stone in ureteral tract. The average diameter measured was 1.2cm. Stones were indifferent at proximal and distal levels. The working channel probe was 0.8mm. The stone was defragmented under clear visuals. Catheter was left in ureter after the procedure and removed after 18 hrs whereas JJ stent was removed after 6 weeks [5]. Patients were regularly checked after 2 weeks' interval. KUB X-ray was preferred to analyze the results of the procedure. SPSS (Version 11.5) was used for analysis of data. Statistical findings were based on variance test, chi-square test and Fisher test at different stages.

RESULTS:

Among 320 patients, 208 (65%) were males and remaining (35%) were females (Table-1). Female to male ratio was 1:1.6. Average age of the subjects under discussion was 30.5 years. In 61% cases the stone was located on the right side whereas in 39% cases it was located on left side.

Table 1: Patients Demographics and Stone Clearance Rate	
Patient Characteristics	Number of Patients
Total Number of Patients	320
Gender Distribution	
Male	208 (65%)
Female	112 (35%)
Mean Age (in years)	30.5 ± 7.5
Mode of Presentation	
Out- Patient Clinic	320 (100%)
Emergency	00 (00%)
Mean Stone Sizes (in cm)	1.2 ± 0.3
JJ Stent Used	9 (3%)
Mean Hospital Stay (in days)	1.28 ± 0.15

The stones were further divided according to their locations i.e. lower, middle and upper ureter (Bar-1). Urinary tract infections were observed in some cases. The duration of stay at hospital was less than 36 hrs. except 47 cases (15%) who had post-operative anomalies like infection with fever and mild hematuria.



Bar: 1 Distribution of stone location

In 59 cases, ureteral catheters or balloon dilators were required. Remaining 261 cases did not require so. The stones were pulverized successfully in 304 (95%) cases (Table-2). The process was delayed in remaining 5% cases due to cystoscope not accessing the stone and floating up of the stone to the kidney.

Minor bleeding and infection was observed in 13% cases. Patients' stay at hospital was not statistically significant. During follow-up visits, 19 patients were diagnosed with residual stone fragments. Seven subjects required ureteral catheterization again for the treatment of trapped stones.

DISCUSSION:

The advancements in ureteroscopy has improved the efficacy and treatment time for the ureteral stones. The procedure is becoming popular due to minimal stay at hospital and comfortable treatment of the condition owing to presence of ureteral stones [6]. During this set-up, 320 patients were treated. Stones were successfully disintegrated in 304 patients whereas procedure was delayed in 16 cases. Among 16 patients, seven were found with stones at upper ureteral tract. Stones managed to float up to kidney after all traditional measure to avoid the stones from going back to kidney. Most of the studies on the topic have generated the matching results at different places around the world and had been documented in the international literature [7]. No complications were noticed during the procedure. A study carried out by Mugiya et al in 2006 reported the same results with no operative complications due to apparatus and skill employed during the procedure [8]. Two native scholars Aqeel, Abdul Hassan and Kamran had the complications such as ureteral perforations owing to use of 9.5 Fr ureteroscope instead of 6.0 Fr or 5.0 Fr ureter scopes. The use of JJ stent in all cases is not supported by our study as in the case of Kamran et al where JJ stent was used in all patients [9]. The use of ureteral catheter along with Foley's catheter is the recommended procedure according to our work. JJ stent is recommended only in difficult and adverse situations. Minor bleeding was observed in some cases during the procedure but it did not blind the scope vision and was normal [10]. The bleeding occurred due to unexpected hitting of probe with the ureter. These small complications were negligible when compared with other studies. Another study argues that energy should be applied to the probe only when stone is intact with the probe and clear and continuous vision should be maintained to avoid complications during operation. The procedure ended up successfully in 273 cases whereas in 47 cases post-operative complications such as urinary tract infection and hematuria were noticed. The complications were overcome in 72 hours [11].

The hospital stay, when compared with other studies, was very less. In the study led by Kamran Abid, the mean time for the patients who developed complications after the procedure was 6 days as compared to our study where the time is less than 72 hours. Six days' time is justified keeping in mind the 7.5 Fr or 8.0 Fr ureteroscope utilized by Kamran Abid et al. By using 6.0 Fr (Karl Storz, Germany), we were able to conduct the delicate procedure in a day time. The patients were emotionally satisfied with our procedure and it had a good financial impact as the subjects no longer had to get admitted in the

hospital. This procedure is getting popular especially in out-patient clinic because of the less time requirements. In our study, the subjects were from far-flung remote locations. We did not have any advance medical care in the vicinity which can be referred in case of major complications. Hence, the treatment was not performed on out-patient basis in our study.

CONCLUSION:

In spite of the fact that our study has yielded encouraging results for ureteroscope lithotripsy with merely a day at hospital but is subordinate on numerous possibly unstable and process-related components. Correct use of ureteroscope (size and type) and skilled paramedical staff is the key to successfully complete the procedure without any complications.

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