



PATIENT PROFILE & OUTCOME IN CASES OF PROXIMAL URETERIC CALCULUS TREATED WITH ESWL COMPARED TO OTHER PROCEDURES

Urology

Dr. Neel S. Shah	2 nd Year Resident, Dept of Urology, Saveetha Medical College Hospital
Dr. Siva Sankar M.*	Associate Professor, Dept of Urology, Saveetha Medical College Hospital *Corresponding Author
Dr. Griffin M.	Associate Professor, Dept of Urology, Saveetha Medical College Hospital
Dr. N. Muthulatha	Professor, Dept of Urology, Saveetha Medical College Hospital
Dr. V. Kamaraj	Professor, Dept of Urology, Saveetha Medical College

ABSTRACT

Introduction- The aim of this article is to review clinical aspects of upper ureteral stones and to analyse the outcomes of therapeutic modalities currently available for treating upper third ureteral calculi.

Method: Patients of upper ureteric stone treated with ESWL, URS, PCNL or open ureterolithotomy were studied prospectively. Patients of solitary upper ureteric stone with <1200 HU, normal urinary tract anomaly and without any previous procedure for renal or ureteric stone were selected in this study.

Results: For ESWL overall success rate was 73% and 27% required auxiliary measures for the further management of stone. For the stones ≤ 1 cm success rate with ESWL is 86%. For the stones > 1 cm success rate is 63%. In URS, overall success rate was 89% and 11% required auxiliary measure. In PCNL, overall success rate was almost 93%. In Open surgery, success rate was 100%.

Conclusion: ESWL is preferred method of treatment for non impacted, ≤ 1 cm upper ureteric stone as being an OPD procedure and with less complications, it is quite cost effective. For the stones which are > 1 cm, impacted and for which auxiliary measures may be required, procedures other than ESWL can be preferred.

KEYWORDS

ESWL, Proximal Ureteric Stone.

INTRODUCTION:

It is no exaggeration to say that there has been a revolution in surgical treatment of urolithiasis. Before 1980, open surgical ureterolithotomy and fluoroscopic basket extraction were the only options available for the treatment of upper third ureteral stones. Few events have altered the milieu of urology as dramatically and as precipitously as the introduction of Extra Corporeal Shock Wave Lithotripsy. Clinical evidence of the successful fragmentation of renal stones by externally administered shock waves was introduced to American Urologic Association (AUA) meeting in Boston in 1981 by Chaussy. Within a relatively short time span, the treatment of renal stone has moved from traumatic open surgery through minimally invasive method of percutaneous endoscopic stone removal to totally non-invasive technique of ESWL. Current minimally invasive options are so reliable and safe that open ureterolithotomy is rarely indicated for the treatment for upper urinary tract calculi, and fluoroscopic basket extraction is considered substandard care for proximal ureteral stones. Since its introduction in the 1980s, extracorporeal shock wave lithotripsy has been a mainstay of treatment of both renal and ureteral stones.

AIMS & OBJECTIVES:

The aim of this article is to review clinical aspects of upper ureteric stones and to analyse the outcomes of therapeutic modalities currently available for treating upper third ureteric calculus.

To compare different modalities for management of upper ureteric stone in terms of –

- Stone free state achieved
- Hospital stay
- Cost effectiveness
- Need for 2nd intervention after use of any one treatment modality.

MATERIALS & METHODS:

Over a period of one year, 100 patients of upper ureteric stone treated with ESWL, URS, PCNL or open ureterolithotomy at Saveetha Medical College Hospital, Chennai, were studied prospectively. Patients of solitary upper ureteric stone with <1200 HU, normal urinary tract anomaly and without any previous procedure for renal or ureteric stone were selected in this study.

- **ESWL:** “Dornier Delta 2” lithotripsy was used and all the patients

were treated under local anesthesia with prior application of Prilox ointment (except children, who were treated under general anaesthesia). Patients with stone size upto 15mm were included in study. Patients were treated in following manner.

Group I - ESWL in situ Group II - ESWL with stenting of ureter

The treatment plan for all ureteric stones included two basic principles:

- Maximum two ESWL sessions were given to each stone before manipulation, assuming that there was some radiological evidence of fragmentation after first session.
- Any stone with no radiological evidence of disintegration after ESWL sessions were manipulated back into kidney and removed by PCNL or URS.

All the patients were treated in the supine position. After localization of stone, shock waves were delivered during expiratory phase. In most of the cases about 1500-2500 shock waves at 18 – 20 KV were given at a time.

• URS (UreteroReno Scopy)

This procedure is done in lithotomy position on a table with facilities of X ray tube and fluoroscopy. Rigid ureteroscope (6 or 8 F) was inserted after placing guide wire into ureter up to the stone. The stone was then removed by forceps or disintegrated by pneumatic lithotripter. After the URS procedure a 6F double J stent was inserted and removed after 2-3 weeks in most of the cases. All patients were operated under spinal anesthesia and prophylactic antibiotics were given.

• Push back of stone and PCNL

Retrogradely stone pushed into renal pelvis and ureteric catheter placed in lithotomy position. In prone or modified supine position, Percutaneous Nephro Lithotomy performed. Percutaneous access achieved under fluoroscopic guidance and with the help of C-arm. Tract dilated with Amplatz dilator sheath. Stone fragmented and removed. Urethral catheter removed after 2 days. Preoperative antibiotics were given. All the patients were treated under either spinal anesthesia or general anesthesia.

• Open surgery or ureterolithotomy

Open ureterolithotomy was done in large impacted upper ureteric

stone with moderate to gross hydronephrosis and/or altered Renal Function Test or as a part of difficult URS or PCNL procedure (stone size 15-30 mm). A plain film of X ray KUB was taken immediately pre operatively in all patients to determine the position of the stone at the time of operation. All patients were treated in general anesthesia.

All patients were given post operative antibiotics, drain removed on 2nd or 3rd post operative day and catheter removal after 4 days, stitches removed on 10th post operative day.

RESULTS:

ESWL

ESWL was used in 30 patients with 2 patients in Group I and 28 patients in Group II. 67% cases were between 20 to 40 years of age, having 77% male and 23% female, from which 57% patients having left sided stone and 43% patients having right sided stone. 97% patients were having stone size between 8 to 15 mm. We have treated patients without anesthesia. It is observed in our experience that average number of shock waves required in upper ureteric stone were 1500 to 2500 in 83% patients.

In present study 93% patients were treated with DJ stenting followed by ESWL, to reduce complications like stricture, ureteral injury etc. The stone free rates of the present study for ESWL was compared with AUA guidelines. The Chi-square test was applied and 'p' value was calculated which was 0.2994 and 0.2482 for stone ≤ 1 cm and > 1 cm respectively.

URS

Present study consisted of 27 patients treated with URS. 85% cases were between 20 to 50 years of age, having 78% male and 22% female, from which 44% patients having left sided stone and 56% patients having right sided stone. 96% patients were having stone size between 8 to 15 mm. Average hospitalization was 2 to 3 days, with most patients returning to light activity after 1 week. The stone free rates of the present study for URS was compared with AUA guidelines. The Chi-square test was applied and 'p' value was calculated which was 0.0507 and 1.0000 for stone ≤ 1 cm and > 1 cm respectively.

PCNL

Present study consisted of 30 patients treated with PCNL. 73% cases were between 20 to 50 years of age, having 70% male and 30% female, from which 63% patients having left sided stone and 37% patients having right sided stone. 83% patients were having stone size between 11 to 20 mm. Average hospitalization was 2 to 3 days, with most patients returning to light activity after 1 to 2 weeks. The stone free rates of the present study for PCNL was compared with AUA guidelines. The Chi-square test was applied and 'p' value was calculated which was 0.3010 and 0.8900 for stone ≤ 1 cm and > 1 cm respectively.

OPEN URETEROLITHOTOMY

Present study consisted of 13 patients treated with PCNL. 54% cases were between 40 to 60 years of age, having 46% male and 54% female, from which 62% patients having left sided stone and 38% patients having right sided stone. 77% patients were having stone size between 16 to 30 mm. Upper ureteric stone has excellent Stone Free Rate, which is 100% in our study as no residual stones were detectable by X rays or ultrasonography. Average hospitalization was 4 to 8 days and average post operative disability was 4 to 6 weeks, based on the fact that a typical incision has regained about 80% of its preoperative strength by then.

Comparison of success rates of different treatment modalities

Comparison of Success Rates of different treatment modalities				
PROCEDURE		Total No. of Patients	%	
ESWL(30)		22	73%	
URS(27)		24	89%	
PCNL(30)		28	93%	
Open(13)		13	100%	
Procedure		Complications	Percentage	
ESWL(30)		3	10%	
URS(27)		4	15%	
PCNL(30)		2	7%	
OPEN(13)		2	15%	
Complication	ESWL	URS	PCNL	OPEN
Major bleeding	0	0	0	0

Colic	3	4	2	0
Urinary leak	0	0	0	0
Hematuria	3	4	0	0
Altered RFT	0	0	0	0
Wound Infection	0	0	0	2

DISCUSSION:

We reviewed our experience with ESWL, URS, PCNL, Open Surgery in 100 patients of upper ureteric calculus. In ESWL, average number of shock waves applied per stone was between 1500-2500 and most of the patients were treated without anesthesia. Overall success rate was 73% and 27% required auxiliary measures for the further management of stone. Complications were noticed in 10%. In URS, overall success rate was 89% and 11% required auxiliary measure mainly for migration of stone in kidney. Complications were noticed in 15%. In PCNL, overall success rate was almost 93% and complications were noticed in 7%. In Open surgery, success rate was 100% but complications were noticed in 15% with prolonged hospital stay and increased patient morbidity. For the stones ≤ 1 cm success rate with ESWL is 86% in our series but considering the facts regarding risk of anesthesia, complications, amount of hospital stay, need for other auxiliary measures and small sample size of study it is still a preferred method for treating upper ureteric stones ≤ 1 cm as compared to other procedures. For the stones > 1 cm success rate is 63% when ESWL is compared to other procedures and 'p' value is < 0.0001 which is statistically very significant.

CONCLUSION:

From our study we conclude that considering the factors regarding risk of anesthesia, complications, amount of hospital stay and need for other auxiliary measures, ESWL is preferred method of treatment for non impacted, ≤ 1 cm upper ureteric stone as being an OPD procedure and with less complications, it is quite cost effective. For the stones which are > 1 cm, impacted and for which auxiliary measures may be required, procedures other than ESWL can be preferred.

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