

# KÜÇÜK BOYUTTAKİ RENAL PELVİS TAŞLARININ SEMİ-RİJİT ÜRETERORENOSKOPİ İLE TEDAVİSİNİN ETKİNLİĞİ

## The Feasibility of Semi-rigid Ureterorenoscopy in Small Sized Renal Pelvic Stones

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### ÖZET

**Giriş:** Bu çalışmada küçük boyutlu renal pelvik taşlarda semi-rijit üreterorenoskop (S-URS) ile vücut dışından şok dalgalarıyla taş kırma (Extracorporeal shock wave lithotripsy (ESWL)) başarısını retrospektif olarak kıyaslamayı amaçladık.

**Gereç ve Yöntem:** Mart 2011 ile 2013 arasında 24 hastaya S-URS ile böbrek taşı tedavisi uygulandı. Kontrol grubu olarak benzer taş karakteristiğine sahip 33 ESWL hastası çalışmaya dahil edildi.

**Bulgular:** Ortalama yaş ve taş boyutu her iki grupta benzerdi. Başarı oranları Grup 1'de %91.7 iken, Grup 2'de %93.9 olarak bulundu ( $p=0.224$ ). Grup 1'de postoperatif 1. günde %75 hastada hematüri izlenirken, Grup 2'de bu oran %3 idi ( $p=0.01$ ).

**Sonuç:** Her ne kadar S-URS ile uygun vakalarda ESWL'ye yakın başarı oranları yakalanmışsa da, hematüri S-URS grubunda daha çok görülmüştür.

**Anahtar kelimeler:** Böbrek taşı; ESWL; Üreteroskopi

### ABSTRACT

**Introduction:** In this retrospective study, we aimed to present the comparison of small-sized renal pelvis stones of patients whom were treated by either semi rigid ureteroscope (S-URS) or ESWL.

**Materials and Methods:** Between March 2011 and 2013, 24 patients were treated with S-URS for renal pelvic stones. 33 patients treated by ESWL with similar parameters were included in the study as the control group.

**Results:** The mean age and size of stones were similar in both groups. The success rates were 91.7% in Group 1, and 93.9% in Group 2 ( $p=0.224$ ). The hematuria rates in the postoperative first day were 75% in Group 1, and 3% in Group 2 ( $p=0.01$ ).

**Conclusion:** While the success rates were similar for both groups, the hematuria rate was higher in S-URS group.

**Key words:** Kidney calculi; ESWL; Ureteroscopy

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## INTRODUCTION

Even though there are many minimal invasive treatment methods for renal pelvis stones, such as Extracorporeal Shock Wave Lithotripsy (ESWL), Percutaneous Nephrolithotripsy (PNL), Flexible Ureteroscopy (F-URS); open or laparoscopic surgery are other treatment options.

For kidney stones <1 cm, ESWL is the first option of treatment, whereas PNL is the first option for kidney stones >2 cm (1). Endourology is the main treatment option for the stones in between. Especially F-URS is the main treatment focus in the non-invasive era.

Semi-rigid ureteroscopy (S-URS) is the gold standard treatment for the whole ureter but it is mostly efficient and safe for lower 1/3 (2,3). Even though upper ureteral and pelvic stones may be treated by S-URS, the reported data is limited (4,5).

In this study, we aimed to present the comparison of renal pelvis stones of patients whom were treated by either S-URS or ESWL.

## MATERIAL AND METHOD

We retrospectively analyzed the files of 24 patients underwent S-URS for renal pelvis stones in our clinic between March 2011 and March 2013 (Group 1). We formed a group of 33 patients having the same demographics and stone size who were treated by SWL (Group 2) for a match pair analysis.

All patients had preoperative intravenous urography and urinary ultrasound (USG). Patients in S-URS group were all treated in a single session. All patients had their stones fragmented by pneumatic lithotripsy (PNL) and removed by stone forceps. In SWL group, patients underwent at most 3 sessions of ESWL. Patients in both groups were evaluated with USG and computerized tomography in post operative third month for stone free status.

Patients having stones in other sites than renal pelvis, having a history of renal operation, having an anatomic anomaly such as ureteropelvic junction obstruction were excluded from the study.

For statistical analysis, Statistical Package for the Social Sciences (SPSS) for Mac 20 was used. To compare the values in groups, student's t test was used. To test for the distribution of variables, Mann-Whitney U test was used. P values <0.05 was considered significant.

## RESULT

Mean patient age for Group 1 was  $51.75 \pm 13.52$ , and for Group 2 was  $45.52 \pm 11.72$  ( $p=0.076$ ). Mean stone size was  $14.3 \pm 5.9$  mm and  $13.3 \pm 3.6$  mm for Groups 1 and 2 respectively ( $p=0.262$ ). Gender and stone localization was similar for both groups. In Group 1, all 22 patients were stone free at three months (91.7%). In second group however, that rate was %93.9 (31 patients) ( $p=0.224$ ). In Group 1, two patients with residual stones were treated with ESWL, and/or flexible URS. In Group 2, 2 patients with residual stones were only followed-up.

In group 1, all patients were treated in a single session. In second group, patients underwent  $1.8 \pm 0.59$  sessions of SWL by a mean frequency of  $2.99 \pm 0.219$  khz and  $2933.3 \pm 230.6$  joules of energy.

Postoperative and post-ESWL hematuria was also compared between groups. In Group 1, hematuria was seen in 18 (75%) patients in the postoperative first day. In the second group hematuria was seen only in one patient (3%) in the post-procedural first day. Hematuria was ceased in the postoperative third day in all patients in Group 1, and in the second day in Group 2. The postoperative hematuria rates were statistically higher in Group 1 ( $p=0.01$ ).

## DISCUSSION

Our study reveals that S-URS could be efficient as ESWL for treatment of renal pelvic stones between 1 and 2 cm in selected patient population.

The treatment of pelvis stones with URS is rare, most of the reports are on pediatric groups (6,7). In this study, we aimed to show that S-URS is a feasible method for treating renal pelvis stones on adult age group.

It should be noted that in all patients in Group 1, the ureteropelvic anatomy gave the opportunity to access renal pelvic stone with semi-rigid ureterorenoscopy. It is not possible to reach renal pelvis in all patients with renal pelvic stones because of different ureteropelvic angles, ureteral length, and ureteropelvic junction diameter.

SWL is one of the gold standard treatment methods for treating kidney stones. It has a success of as high as 95% (8,9). In our study, our success rate was 93.9% in SWL group.

In our study, success rates of ESWL and S-URS have been found to have similar. Especially following successful fragmentation with S-URS, there is a high probability of stone-free state. Treating upper ureteral stones, there is a high success with S-URS (2). Similar to the outcomes of the literature, we have found 91.7% success rates with renal pelvis stones.

In regard to complications, ESWL is a highly safe method for treating renal pelvis stones (10). Studies also emphasize the safety of URS even though there are not many publications concerning the treatment of the upper system (11). In our study, both interventions were found to be safe. The only difference seen in postoperative-procedural was hematuria, which was observed more frequently in S-URS group.

European Urological Association recommends the use of rigid/semi-rigid ureteroscopy in the whole ureter.

The guideline also states higher risk of residual stones in the upper urinary system (3,12). Upper ureteral stones have the risk of stone migration to renal pelvis or calyces and therefore halting the procedure. In our study, we successfully reached to the renal pelvis and fragmented the stones with laser lithotripsy. There were no cases with stone migration. Our results emphasize that S-URS is as efficient as ESWL in treating renal pelvis stones.

For treating kidney stones, flexible ureteroscopy is a more common device. The flexible instrument is highly successful in treating pelvic stones as well as calyceal stones (13). The high cost and vulnerability of this device makes it harder to acquire.

The vulnerable points of this study are: its retrospective design and limited patient anatomical characteristics. Also we should note again that the operation with S-URS was only performed in patients with possible access to pelvical system.

## CONCLUSION

Even though the low patient population and its retrospective manner are the limitations of our study, we believe this study may be helpful for physicians to consider this traditional method on renal pelvic stones.

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