SHORT COMMUNICATION

Analysis of clinical factors associated with intraoperative and postoperative complications of retrograde intrarenal surgery

Cuneyt Ozden[1], Cetin Volkan Oztekin[2], Sahin Pasali[3], Samet Senel[4], Doruk Demirel[5], Suleyman Bulut[6], Yalcin Kizilkan[7]

Abstract

The aim of this study was to evaluate the factors affecting intraoperative and postoperative complications in retrograde intrarenal surgery. In this retrospective cohort study, 706 retrograde intrarenal surgery procedures administered to 617 patients were reviewed. Intraoperative and postoperative complications were classified according to the modified Satava and modified Clavien classification systems. The stone-free rate was 407 (57.6%) and the success rate was 528 (74.8%). Intraoperative complications were observed in 215 (30.5%) patients. The most common intraoperative complication was mild bleeding 60(8.5%), while the only independent risk factor associated with intraoperative complications was the presence of residual stones. Postoperative complications were observed in 190 (26.9%) patients. The most common postoperative complication was fever requiring antipyretic drugs 60(8.6%), while independent risk factors associated with postoperative complications were the presence of residual stones and solitary kidney.

Keywords: Stone, RIRS, Modified Clavien, Modified Satava.

DOI: https://doi.org/10.47391/JPMA.449

Introduction

There has always been a trend towards less invasive options for treatment of urinary tract stones, which ultimately led to a major decline in opting for open surgery. Miniaturisation of endoscopic equipment, increased optical quality and better visualisation, invention of HoYAG laser lithotripsy and increased overall endo-surgical expertise among urologists are the important confounding factors responsible for this paradigm shift. Shock wave lithotripsy (SWL) and ureteroscopy (URS) for ureteric stones, and SWL, percutaneous nephrolithotomy (PNL) and retrograde intrarenal surgery (RIRS) for kidney stones are the less invasive treatment options as compared to open surgery. RIRS, in particular, has been increasingly preferred over other techniques in recent years due to a lower complication rate as compared with PNL and a greater stone-free rate as compared with ESWL. Along with technological progress, RIRS has been an effective treatment option for stones below 20mm in size and for selected cases.[1-4]

Although RIRS is less invasive than PNL, serious complications can still occur. Several retrospective studies have been conducted regarding the complications of semi-rigid ureteroscopy, however, studies about the complications of RIRS are scarce.[5,6] In the present study, we investigated the factors influencing the intraoperative and postoperative complications of RIRS.

Patients/Methods and Results

This study was performed in accordance with the principles of Helsinki Declaration and was approved by the Clinical Research Ethics Committee of Ankara City Hospital on December 12, 2019. (approval no: E1-19-39).

Between January 2013 and November 2018, 842 surgeries were performed in our clinic. After excluding the patients whose data was incomplete, retrospective analysis of 706 cases where RIRS procedures were performed were included in the study. The cases where diagnostic ureterorenoscopy or only rigid ureterorenoscopy was performed were excluded. Before the surgical procedure, medical history, physical examination, complete blood count, full biochemistry, urine analysis and culture, serologic evaluation and coagulation tests were done. All the patients had undergone imaging studies such as kidney-ureter-bladder radiography, urinary ultrasonography and non-contrast abdominopelvic computed tomography. Appropriate antibiotic treatment had been provided to the patients if urine culture was positive before the surgical procedure. Additionally, intravenous 2g Cefazolin Sodium prophylaxis had been administered to all patients within one hour preoperatively; however, additional antibiotic treatment was not administered to patients who did not have infective complications in the postoperative period.

Patients who underwent surgical procedure were evaluated prior to the operation by their demographic features, which included medical history, age, cumulative stone burden, stone density, number of stones, localisation of stone, urinary system infection, history of previous stone surgery, existence of congenital renal anomaly and solitary

[1,4-7]Department of Urology, Ankara City Hospital, Ankara, Turkey; [2]Department of Urology, Universtiy of Kyrenia, Kyrenia, Cyprus; [3]Department of Urology, Dr Munif Islamoglu Kastamonu State Hospital, Kastamonu, Turkey.
Correspondence: Samet Senel. e-mail: samet_senel_umt@hotmail.com

kidney. Additionally, the patients were evaluated perioperatively and postoperatively with factors such as duration of operation, duration of postoperative hospitalisation, JJ stent duration, presence of postoperative residual stone, existence of asymptomatic residual stone less than 3 mm and success rate. The patients underwent non-contrast abdominopelvic computed tomography to evaluate cumulative stone burden, stone density, number of stones, and localisation of the stone. The cumulative stone burden was described as the two-dimensional area obtained by multiplying the longest diameter of the stone to the vertical diameter of the stone. The burden was added in the presence of multiple stones.

Retrograde intrarenal surgery was performed under general anaesthesia in dorsal lithotomy position. Semi-rigid URS was initially performed in order to dilate the ureteric orifice and the ureter. After the URS and placement of a guidewire, a 9.5-11f ureteral access sheath, was introduced into the ureteral lumen. If the URS was not successful, a JJ stent was left in place and RIRS was postponed for two weeks. A 7.5 Ch flexible ureterorenoscope (Flex X2, Karl Storz GmbH, Tuttlingen Germany) and Sphinx 30 and 30 watts Sphinx Jr HoYAG laser generators (Lisa Laser Products, Katlenburg-Lindau, Germany) with 200-365µm fibres were used for renoscopy and lithotripsy, respectively. While a JJ stent was left in place only when necessary, a urethral foley catheter was placed at the end of each procedure. The correct placement of JJ stent was confirmed with a KUB film on the first day after the surgery. The treatment outcome was evaluated by a KUB film and non-contrast CT scan at the end of the first month after the procedure. Success was defined as absence of any residual stones or fragments >3mm in an asymptomatic patient.

Intraoperative and postoperative complications were classified according to modified Satava and modified Clavien systems, respectively.[7,8] The clinical factors potentially associated with intraoperative and postoperative complications were investigated.

Continuous and categorical variables were evaluated with Mann-Whitney U test and Chi-square tests, respectively. Univariable and multivariable logistic regression analyses were used for identification of independent risk factors associated with intraoperative and postoperative complications. Statistical significance was determined as $p < 0.05$ for all analyses.

Overall, records of 706 RIRS procedures (629 first [bilateral in 12], 70 second, 5 third and 2 fourth sessions) in 617 patients were retrospectively reviewed. The mean patient age was 45.6 ± 14.3 years, and the mean cumulative stone burden was 155.4 ± 96.9 mm^2. In 176 (24.9%) out of the total procedures, the cumulative stone burden was >200 mm^2, while the mean stone density was 992.9±314.8 HU. Two hundred and thirty-seven (33.6%) patients had multiple stones; stones were located in the renal pelvis in 235 (38.1%) patients, lower pole calyx in 185 (30%), middle calyx in 55 (8.8%), upper pole calyx in 38 (6.2%), and more than one location in 104 (16.9%) patients. Urinary tract infections, congenital renal malformations, solitary kidney and history of previous stone surgery were present in 44 (7.2%), 36 (5.8%), 23 (3.7%) and 268 (43.5%) patients, respectively.

Mean operative, hospitalisation and JJ stent times were: 54.4±18.8 minutes, 1.8±3.8 days and 31.8±20.8 days, respectively. Residual stones were present in 178 (25.2%) RIRS procedures. Stone-free rate was 407 (57.6%) and the success rate was 528 (74.8%).

Intraoperative complications were observed in 215 (30.5%) RIRS procedures. Most frequent complications were mild haematuria and mucosal laceration. Intraoperative complications were classified according to the modified Satava system (Table-1). Intraoperative complications were

Table-1: Classification of the intraoperative complications according to the Modified Satava system.

Modified Satava		n (%)
Grade 1	Complications which do not require any intervention	114 (%16.1)
	Mild bleeding	60 (%8.5)
	Minimal injury to the ureteral mucosa	42 (%5.9)
	Failure to access to the stone, follow-up only.	12 (%1.7)
Grade 2	Complications managed with an endoscopic approach	101 (%14.3)
2a	Complications managed with an endoscopic procedure (same session).	57 (%8.1)
	Failure to access to the stone, followed by SWL (±stent)	17 (%2.4)
	Mucosal injury managed with a stent	36 (%5.1)
	Failure to access to the stone, followed by PCNL	-
	Perforation of the ureteral wall, managed with a stent.	4 (%0.6)
2b	Complications managed with an endoscopic procedure (repeat session)	44 (%6.2)
	Failure to access to the stone, followed by secondary RIRS	16 (%2.3)
	Failure to access to the stone, followed by secondary PCNL	2 (%0.3)
	Secondary RIRS for clinically significant stone fragments	24 (%3.4)
	Severe bleeding causing the termination of the procedure, followed by secondary RIRS.	2 (%0.3)
Grade3	Complications requiring open or laparoscopic surgical correction	-
	Severe bleeding, which requires open or laparoscopic surgery	-
	Failure to access the ureter or the stone, which requires open surgery.	-
	Perforation of the ureteral wall, which requires open surgery	-
	Ureteral intussusception	-
	Ureteral avulsion	-

RIRS: Retrograd intrarenal surgery PNL: Percutanous nephrolitotomy SWL: Shock Wave Lithotripsy.

Table-2: Univariable and multivariable logistic regression analyses of factors associated with intraoperative complications.

	Univariable logistic regression		Multivariable logistic regression	
	OR (CI 95%)	*p*-value	OR (CI 95%)	*p*-value
Age (years)				
≤50	1		1	
>50	1.04 (0.75-1.4)	0.77	1.1 (0.7-1.6)	0.64
Cumulative stone burden (mm^2)				
<100	1	0.001	1	0.51
100-200	1.3 (0.9-1.9)	0.13	1.29 (0.74-2.23)	0.35
>200	2.2 (1.4-3.4)	0.001	1.47 (0.74-2.93)	0.29
Stone density				
≤1000	1		1	
>1000	1.5 (1.02-2.2)	0.32	1.25 (0.84-1.8)	0.26
Number				
One	1		1	
Multiple	0.9 (0.68-1.35)	0.83	0.98 (0.61-1.57)	0.93
Urinary tract infection	1.9 (1.1-3.5)	0.02	1.34 (0.89-2.34)	0.25
Previous stone surgery	1.07 (0.77-1.4)	0.67	0.91 (0.6-1.38)	0.67
Congenital renal anomaly	1.19 (0.61-2.3)	0.59	1.7 (0.79-3.65)	0.17
Solitary kidney	1.01 (0.4-2.3)	0.97	0.99 (0.33-3.01)	0.99
Charlson comorbidity index				
≤2	1		1	
>2	1.2 (0.8-1.7)	0.34	1.1 (0.7-1.7)	0.42
Operative time (min)				
<60	1		1	
>60	1.9 (1.3-2.6)	0.001	1.37 (0.91-2.07)	0.13
Stone location				
Upper calyx	1	0.89	1	0.28
Middle calyx	0.94 (0.4-2.1)	0.89	0.87 (0.3-2.5)	0.79
Lower calyx	0.82 (0.4-1.6)	0.59	0.51 (0.2-1.2)	0.14
Pelvis	0.97 (0.4-1.9)	0.93	0.81 (0.3-1.9)	0.64
Multiple	1.04 (0.4-2.1)	0.9	0.56 (0.2-1.4)	0.22
Residual stone	2.7 (1.9-3.9)	0.001	2.9 (1.9-4.4)	0.001

Table-3: Classification of postoperative complications according to the modified Clavien system.

Modified Clavien		**n (%)**
Grade 1	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic or radiological interventions. (Antiemetics, antipyretics, analgesics, diuretics, electrolytes and physiotherapy are acceptable therapeutic options)	
	Fever requiring antipyretics (Lasted more than 48h in 27 patients)	61 (%8.6)
	Transient acute nephropathy	11 (%1.6)
	Postoperative haematuria	51 (%7.2)
	Renal colic	20 (%2.8)
Grade 2	Requiring pharmacological treatment with drugs other than allowed for grade1 complications.	
	Urinary tract infection	17 (%2.4)
Grade3	Requiring surgical, endoscopic or radiological intervention	
Grade 3a	Requiring interventions without general anaesthesia	
	Perirenal abscess	2 (%0.3)
Grade 3b	Requiring interventions with general anaesthesia	
	Stent migration	6 (%0.8)
	Stein strasse	17 (%2.4)
Grade 4	Life-threatening complication requiring intensive care	
Grade 4a	Single organ dysfunction	-
Grade 4b	Multi organ dysfunction	
	Sepsis	2 (%0.3)
	Septic shock	3 (%0.4)
Grade 5	Patient demise	-

associated with cumulative stone burden, urinary infection, operative time, and residual stone in univariable analysis. The presence of residual stone was the only independent risk factor for intraoperative complications (OR:2.9; %95CI:1.9-4.4; *p*=0.0001), (Table-2).

One hundred and ninety (26.9%) patients experienced postoperative complications. Two most frequent complications were fever, treated with antipyretics and haematuria. According to the modified Clavien classification system, grade 1, 2, 3a, 3b and 4b complications were observed in 143 (20.1%), 17 (2.4%), 2 (0.3%), 23 (3.3%) and 5 (0.7%) RIRS procedures respectively. Classification of the postoperative complications are summarised in table-3. The presence of postoperative complications was associated with cumulative stone burden, presence of a solitary kidney, operative time and the presence of a residual stone. Multivariable analysis revealed that residual stone (OR: 1.7; %95 CI: 1.1-2.7; p:0.014) and solitary kidney (OR: 3.1; %95 CI:1.2-8.6; p:0.016) were independent risk factors for postoperative complications (Table-4). There were 27 patients with solitary kidney, out of which the stone could not be reached in five, three had haematuria, one had haematuria in addition to unreachable stone, and one had a stone pathway. The patients whose stones could not be reached were treated by ESWL. Haematuria regressed spontaneously within a few days. One patient with a stone pathway was treated with ureterorenoscopy because of his symptoms. The mean length of hospital stay (1.6 ± 2.2 days) in patients with solitary kidneys was statistically significantly longer than those with bilateral kidneys (3.4 ± 4.6 days) (*p*=0.0001).

Table-4: Univariable and multivariable logistic regression analyses of factors associated with postoperative complications.

	Univariable logistic regression		Multivariable logistic regression	
	OR (CI 95%)	*p*-value	OR (CI 95%)	*p*-value
Age (years)				
≤50	1	0.84	1	0.62
>50	1.03 (0.73-1.45)		0.85 (0.44-1.6)	
Cumulative stone burden (mm^2)				
<100	1	0.01	1	0.21
100-200	1.62 (1.08-2.43)	0.01	1.56 (0.9-2.6)	0.09
>200	1.83 (1.17-2.88)	0.008	1.6 (0.8-2.9)	0.13
Stone density				
≤1000	1	0.47	1	0.23
>1000	1.1 (0.7-1.7)		1.05 (0.68-1.62)	
Number				
One	1	0.29	1	0.24
Multiple	0.82 (0.57-1.18)		0.7 (0.4-1.2)	
Urinary tract infection	1.1 (0.6-2.1)	0.67	0.85 (0.39-1.8)	0.67
Previous stone surgery	1.3 (0.9-1.8)	0.1	1.22 (0.8-1.8)	0.34
Congenital renal anomaly	0.4 (0.18-1.08)	0.17	0.58 (0.23-1.48)	0.26
Solitary kidney	3.3 (1.5-7.3)	0.003	3.1 (1.2-8.6)	0.016
Charlson comorbidity index				
≤2	1	0.13	1	0.07
>2	1.3 (0.9-1.8)		1.5 (0.9-2.3)	
Operative time (min)				
<60	1	0.03	1	0.59
>60	1.45 (1.03-2.03)		0.87 (0.54-1.4)	
Stone location				
Upper calyx	1	0.5	1	0.08
Middle calyx	0.7 (0.3-1.7)	0.5	0.68 (0.25-1.85)	0.45
Lower calyx	0.5 (0.2-1.1)	0.09	0.36 (0.15-0.86)	0.02
Pelvis	0.6 (0.3-1.2)	0.1	0.45 (0.19-1.03)	0.06
Multiple	0.6 (0.3-1.3)	0.2	0.33 (0.13-0.81)	0.01
Residual stone	1.7 (1.2-2.5)	0.002	1.7(1.1-2.7)	0.014

Discussion

European Association of Urology recommends SWL as the first-line of treatment for renal stones smaller than 20 mm. Retrograde intrarenal surgery is alternatively recommended for this group of stones based on the lower need for retreatment and rapid achievement of stone-free status with this technique, as compared to SWL. PNL is the first-line treatment for kidney stones larger than 20mm, for which RIRS is also recommended if the characteristics of the patient or the stone are not favourable for PNL.[9] The unfulfilled need for effective treatment modalities with minimal morbidity motivated the invention of novel techniques like RIRS, as alternatives for SWL and PNL. Although RIRS exhibits a high level of efficacy together with a very good safety profile, serious complications such as bleeding and sepsis can still be observed.[6]

Baş et al[5] published a study of 1,571 RIRS procedures, in which they used modified Clavien and modified Satava systems for evaluation of postoperative and intraoperative complications. Intraoperative and postoperative complications were observed in 5.9% and 7.3% of patients, respectively. In univariable analyses, complications were associated with stone diameter, number of stones and congenital renal anomalies, while the presence of a congenital renal anomaly was the only independent predictor in multivariable analysis.[5] In another study, modified Satava system was used to classify intraoperative complications, which were observed in 30.4% of the procedures. There were grade 1, grade 2a and grade 2b complications in 15.9%, 5.6% and 8.9% of the operations, while no grade 3 complications were observed.[6] Tepeler et al reported intraoperative complications in 12.6% of the 1,208 semi-rigid ureteroscopic stone treatments using the modified Satava system. Of these, 4.5%, 4.4%, 3.2% and 0.57% were grades 1, 2a, 2b and 3, respectively.[10] In the series reported by Bozkurt et al, the stone-free rate was 89.2%, while the perioperative complication rate was 5.4%, all of which were grade 1 or 2.[11] In a review of 10 studies by Breda et al, stone-free rate and perioperative complication rate were 89.3% and 8%, respectively. The frequency of major complications was 1.9%.[12] Gülpınar et al reported a postoperative complication rate of 5.3% in 947 RIRS patients, using the modified Clavien system.[13] Our intraoperative and postoperative complication rates in 706 RIRS procedures were 30.5% and 26.9%, respectively, both of which were much higher than the values in the literature. Most common intraoperative complication was mild bleeding (Satava Grade 1) which was seen in 8.5% of the procedures. Most frequent postoperative complication was fever treated with antipyretics (Clavien grade 1) in 8.6% procedures, which lasted for more than 48 hours in 27 patients. Most of the intraoperative and postoperative complications were Satava grade 1 (16.1%) and Clavien grade 1 (20.1%), respectively. These results were in concordance with the literature.[6,14,15] Less frequent complications were: bleeding leading to termination of the procedure in 2 (0.3%) (Satava grade 2a) patients, perirenal abscess in 2 (0.3%) (Clavien grade 3a), stent migration in 6 (0.8%) (Clavien grade 3b), steinstrasse in 17 (2.4%) (Clavien grade 3b), sepsis in 2 (0.3%) (Clavien grade 4b) and septic shock in 3 (0.4%) (Clavien grade 4b) patients. No procedure-

related mortality was observed.

Although studies in the literature report presence of congenital renal anomalies as the only independent factor associated with intraoperative and postoperative complications, no correlation was found in the present study. Instead, presence of a solitary kidney and residual stones were the two factors which were associated with the complications.

RIRS is a safe procedure for patients with a solitary kidney, with high success rates and a good safety profile.[16-18] In a study by Baş et al, complications were observed in 2 of 17 RIRS procedures performed for solitary kidneys, while Elbir et al reported no complications in 24 RIRS procedures on solitary kidneys.[5,19]

In the present study, 26 procedures (3.7%) were performed on solitary kidneys. Among them, 14 patients experienced postoperative complications. As a novel finding, the presence of a solitary kidney was the only risk factor for postoperative complications in multivariable analysis.

The limitations of our study are: its retrospective design, lack of long-term follow-up with regard to the evaluation of possible late complications (i.e. ureteral stricture), the heterogeneity in imaging methods for evaluation of treatment outcome and lack of knowledge about the composition of the stones. Despite these limitations, there are a limited number of studies in the literature, which focus on detailed evaluation of RIRS complications.

Conclusion

According to our findings, the presence of residual stone is associated with both intraoperative and postoperative complications and the presence of solitary kidney is associated with postoperative complications only. Our results should be confirmed by evidence from prospective studies.

Disclaimer: The abstract of this study was presented in the 13th Biennial Congress of Turkish Society of Endourology, Antalya/Turkey.

Conflict of interest: None.

Funding disclosure: None.

References

1. Guisti G, Proietti S, Peschechara R. Sky is no limit for ureteroscopy: extending the indications and special circumstances. World J Urol 2015; 33: 309-14.
2. Breda A, Ogunyemi O, Leppert JT, Lam JS, Schulam PG. Flexible ureteroscopy and laser lithotripsy for single intrarenal stones 2 cm or greater–is this the new frontier? J Urol 2018; 179: 981–4.
3. Aboumarzouk OM, Monga M, Kata SG, Traxer O, Somani BK. Flexible ureteroscopy and laser lithotripsy for stones >2 cm: a systematic review and meta-analysis. J Endourol 2012; 26: 1257-63.
4. Lim SH, Jeong BC, Seo SI, Jeon SS, Han DH. Treatment outcomes of retrograde intrarenal surgery for renal stones and predictive factors of stone-free. Korean J Urol 2010; 51: 777-82.
5. Baş O, Tuygun C, Dede O, Sarı S, Çakıcı MÇ, Öztürk U, et al. Factors affecting complication rates of retrograde flexible ureterorenoscopy: analysis of 1571 procedures-a single-centreexperience. World J Urol 2017; 35: 819-26.
6. Oguz U, Resorlu B, Ozyuvali E, Bozkurt OF, Senocak C, Unsal A. Categorising intraoperative complications of retrograde intrarenal surgery. Urol Int 2014; 92: 164–8.
7. Satava RM. Identification and reduction of surgical error using simulation. Minim Invasive Ther Allied Technol 2005; 14: 257–61.
8. Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6,336 patients and results of a survey. Ann Surg 2004; 240: 205–13.
9. Türk C, Neisius A, Petrik A, Seitz C, Skolarikos A, Thomas K. EAU guidelines on urolithiasis. EAU guidelines, 2020.
10. Tepeler A, Resorlu B, Sahin T, Sarikaya S, Bayindir M, Oguz U, et al. Categorization of intraoperative ureteroscopy complications using modified Satava classification system. World J Urol 2014; 32: 131–6.
11. Bozkurt OF, Resorlu B,Yildiz Y, Can CE, Unsal A. Retrograde intrarenal surgery versus percutaneous nephrolithotomy in the management of lower-pole renal stones with a diameter of 15 to 20 mm. J Endourol 2011; 25: 1131–5.
12. Breda A, Angerri O. Retrograde intrarenal surgery for kidney stones larger than 2.5cm. Curr Opin Urol 2014; 24: 179–83.
13. Tolga-Gulpinar M, Resorlu B, Atis G, Tepeler A, Ozyuvali E, Oztuna D, et al. Safety and efficacy of retrograde intrarenal surgery in patients of different age groups. Actas Urol Esp 2015; 39: 354–9.
14. Sabnis RB, Ganesamoni R, Doshi A, Ganpule AP, Jagtap J, Desai MR. Micropercutaneous nephrolithotomy (microperc) vs retrograde intrarenal surgery for the management of small renal calculi: a randomized controlled trial. BJU Int 2013; 112: 355–61
15. Resorlu B, Unsal A, Ziypak T, Diri A, Atis G, Guven S, et al. Comparison of retrograde intrarenal surgery, shockwave lithotripsy, and percutaneous nephrolithotomy for treatment of medium-sized radiolucent renal stones. World J Urol 2013; 31:1581–6.
16. Lai D, Chen M, He Y, Li X, Wan S. Safety and efficacy of retrograde intrarenal surgery for the treatment of renal stone in solitary kidney patients. Ren Fail 2018; 40: 390-4.
17. Gao X, Peng Y, Shi X, Li L, Zhou T, Xu B, et al. Safety and efficacy of retrograde intrarenal surgery for renal stones in patients with a solitary kidney: a single-centreexperience. J Endourol 2014; 28: 1290-4.
18. Atis G, Gurbuz C, Arikan O, Kilic M, Pelit S, Canakci C, et al. Retrograde intrarenal surgery for the treatment of renal stones in patients with a solitary kidney. Urology 2013; 82: 290-4.
19. Elbir F, Başıbüyük İ, Topaktaş R, Kardaş S, Tosun M, Tepeler A, et al.Flexible ureterorenoscopy results: Analysis of 279 cases. Turk J Urol 2015; 41: 113-8.