



Treating Renal Pelvic Stones with Rigid Ureterorenoscopy

Erdoğan Ağlamış¹, Erduran Gür², Ali Beytur³, Cemal Taşdemir³, Mehmet Özgür Yücel⁴

¹Elazığ Training and Research Hospital, Department of Urology, Elazığ

²Elazığ Hayat Hospital, Department of Urology, Elazığ

³Inonu University School of Medicine, Department of Urology, Malatya

⁴Adıyaman Training and Research Hospital, Department of Urology, Adıyaman

Abstract

Aim: To evaluate the treatment of renal pelvic stones with rigid ureterorenoscopy.

Material and Methods: Total of 13 patients were evaluated between January 2009 and March 2010. Stones in all patients were equal to or less than 2 cm. The patients who refused ESWL (Extracorporeal Shock Wave Lithotripsy) treatment or those who have failed in ESWL treatment were included in the study. Other treatment options were explained to patients. Rigid ureterorenoscopy was performed with pneumatic lithotripter. Double-J urethral stent was applied in all the cases.

Results: The mean age of the patients was 53±4.23 years (minimum: 33 and maximum: 73 years). The average operation time was 42.3±14.2 minutes (minimum: 35 and maximum: 55 minutes). Small stone fragments were passed spontaneously in six patients in three weeks. Stone way was created in three patients and we performed re-ureterorenoscopy in these cases after two weeks. The fragments of small stones migrated to the renal calyces in three cases. Stone-free rate was 77% after all the procedures. Observed complications: hematuria in two patients cases in postoperative two days (no blood transfusion needed); high fever in one patient and severe dysuria in one patient.

Conclusion: There are treatment options such as percutaneous nephrolithotomy, flexible ureterorenoscopy, open surgery for treatment of renal stones. The rigid ureterorenoscopy can be considered as a low cost and effective treatment in the renal pelvic stones.

Key Words: Rigid Ureterorenoscopy; Renal Pelvic Stone; Treatment.

Renal Pelvis Taşlarının Rijid Üreterorenoskopi İle Tedavisi

Özet

Amaç: Çalışmamızdaki amacımız, rijit üreterorenoskopi ile renal pelvis taşlarının tedavi edilebilirliğini değerlendirmek.

Gereç ve Yöntemler: Çalışmaya Ocak 2009 ve Mart 2010 tarihleri arasında, renal pelvis taşı (2 cm veya daha küçük) nedeniyle ESWL (Extracorporeal Shock Wave Lithotripsy) uygulanan, ancak ESWL tedavisi ile taşı kırılmayan veya ESWL tedavisi istemeyen toplam 13 hasta dahil edildi. Hastalara diğer tedavi alternatifleri anlatıldı. Rijit üreterorenoskopi ve pnömotik litotriptör ile renal pelvis taşları kırılarak tedavi edildi. Ameliyat edilen hastaların hepsine Double-J üreteral stent takıldı.

Bulgular: Hastaların ortalama yaşı 53±4.23 (min: 33-mak: 73) idi. Ortalama operasyon süresi 42.30+14.13 dakika (min: 35-mak: 55) idi. 6 hastada küçük parçalar 3 hafta içinde kendiliğinden düştü. 3 hastada, üreterde taş yolu oluştu, 2 ay sonra tekrar üreterorenoskopi yapıldı. 1 hastada, üreterde düşmeyen büyük parça taş için üreterorenoskopi yapıldı. 3 hastada, yetersiz kırılan taş parçalarının bir kısmı kalıklara migrate oldu. Tüm bu işlemlerden sonra, çalışmaya dahil edilen hastalardaki başarı oranı %77 idi. Hastalarda gözlenen komplikasyonlar: 2 hastada post-op 1 gün süren, ancak transfüzyon gerektirmeyen, hematüri oldu, 1 hastada yüksek ateş oldu, 1 hastamızda ise şiddetli dizüri oldu.

Sonuç: Böbrek taşlarının tedavisinde perkütan nefrolitotomi, fleksible üreterorenoskopi, açık cerrahi gibi çeşitli tedavi alternatifleri vardır. Bu tedavi alternatiflerine ek olarak, renal pelvis taşlarında rijit üreterorenoskopi, düşük maliyetli ve etkin bir tedavi alternatifi olarak düşünülebilir.

Anahtar Kelimeler: Rijit Üreterorenoskopi; Böbrek Pelvis Taşı; Tedavi.

INTRODUCTION

Urinary tract stone disease, probably the most common disease in urology, constitutes around 14% of the urinary diseases in Turkey and it is thought to be endemic (1). Kidney stone localization, its size, number, structure and anatomy of the urinary system are the main factors that determine the tract stone disease treatment methods (2,3). Major surgery methods in the treatment of kidney stones are retrograde intrarenal surgery, ureterorenoscopy, pyelolithotomy and percutaneous nephrolithotomy.

Ureterorenoscopy is the imaging of ureter and renal pelvis in order to have an endoscopic diagnosis and/or imaging these parts for therapeutic purposes (4). In 1912 for the first time, the monitoring of a female patient's dilated ureter with a paediatric cystoscope has been the source of inspiration for the development of ureterorenoscopy techniques (5). Today, thanks to the increasing technological advancements, better lithotripter props and the developments in laser technologies, ureterorenoscopy, along with its expanded indications, has become quite common (5).

Rigid ureterorenoscopy (URS) is widely applied in the treatment of ureteral stones, while flexible URS and retrograde intrarenal surgery are applied for the treatment of kidney stones. In this work, we aimed to assess to what extent renal pelvic stones are treatable by rigid ureterorenoscopy.

MATERIAL AND METHODS

4 female and 9 male, a total of 13 patients who got renal pelvic stone treatment by rigid ureterorenoscopy between January 2009 and March 2010 were retrospectively analysed. These patients, who were admitted to our clinic with urolithiasis pre-diagnosis, were asked to complete the following laboratory and radiological tests: urinalysis, blood chemistry, blood count, abdominal ultrasonography, direct urinary tract ultrasonography (DUSG). Patients who were diagnosed with kidney stones underwent urography and/or stone protocol computed tomography for their urinary anatomy and localisation of the stones. After explaining treatment options to patients, we primarily proposed ESWL (Extracorporeal Shock Wave Lithotripsy) to patients with kidney stones ≤ 2 cm. Eventually, 13 patients with still broken stones after the ESWL treatment and those who refused the ESWL option underwent rigid ureterorenoscopy. These patients had single renal pelvic stones and their urinary collection system was not dilated. For patients with urinary tract infection, we applied antibiotic therapy according to their antibiogram results and started ureterorenoscopy after the infection has been removed.

Patients were applied URS with an 8.5 F rigid ureterorenoscope in lithotomy position. We regularly used guide wire during the URS surgery. Stone crushing was carried out with pneumatic lithotriptors and the particles were removed with stone forceps. We didn't apply further stone crushing for stones approximately 2 millimeters (mm) and below. All patients were fitted with double-J ureteral stents. On post-operative day 1, we had an urine check and applied DUSG. In the 3rd-4th weeks after the operation, we reevaluated patients through urinalysis, urine culture, urinary system X-ray and abdominal ultrasonography. Patients with fragments smaller than 2 mm or without any fragments were considered stone-free. In our study, we evaluated operative findings, post-operative follow-up findings, success rates and complications concerning aforementioned patients.

RESULTS

The mean age of the patients included in the study was 53 ± 4.23 years. The average operation time was 42.30 ± 14.13 minutes. The mean stone size was 15.4 cm (min:10-Max:20). In 3 of the patients (23%) insufficiently broken stone fragments were canalised towards the calyces. During the process, 2 of the patients (15%) had mucosal lesions. In 6 patients (46%), small fragments (≤ 2 mm) were expelled within 3 weeks. In 3 patients (23%), we observed ureter stone path formations and asked for a new URS in two months. For one of the patients we had

to reapply ureterorenoscopy due to a resisting larger stone that wouldn't pass the ureter. After all these operations, 10 of our patients were stone free, with the success rate of 77%. In 2 patients, we observed hematuria during the post-operative period though it did not require transfusion and lasted only for one day. One of the patients had a high fever but that also recovered with antibiotic therapy (Table 1). Following the operation, 11 patients had mild dysuria while 2 patients suffered from severe dysuria. During the surgery and the post-operative period, no major complications were observed.

Table 1. Complications observed.

Complications	Number of Patients	Percentage
Hematury	2	15
Fever	1	8
Mucosal legions	2	15
Fragment migration towards calyces	3	23
Stone Channel Formation in the Ureter	3	23
Unmoving ureter fragment	1	8

DISCUSSION

With technological advances in endoscopic devices, complication rate in ureterorenoscopy operations has decreased while the surgical success rate increased (6). However, the biggest factor affecting the success and complication rates is the experience of the operating team. In Turkey, although the use of flexible URS tools is becoming widespread many clinics are still more experienced in rigid URS.

ESWL is still the first preferred treatment method in the treatment of kidney stones ≤ 2 mm (7). However, if ESWL is not successful or inapplicable due to reasons related to social life, surgical treatment methods are favoured (7). In such patients, percutaneous nephrolithotomy is a very effective method but, since it is less invasive, retrograde intrarenal surgery techniques with flexible URS are also expanding (7).

The success rate of treating ureteral calculi with rigid ureterorenoscopy varies according to the characteristics of the stone. Success rates reported in the literature is as follows: 95% for distal ureteral stones, 80% for ureteral stones in the middle and 50% for upper ureteral stones (8,9,10).

For renal pelvic stones, however, rigid ureterorenoscopy is not common. Nakayama has reported a success rate of 70% after treating 10 patients with rigid ureterorenoscopes for their renal pelvic stones. There were no reports of any major complication during the procedure [11]. In our study, too, we achieved a similar success rate and, similarly, with no major complications. Because of worries about probable complications and the lack of manoeuvrability of rigid ureterorenoscope inside the kidney, urologists do not prefer this method

and keep away from rigid ureterorenoscope. However, as reported in the literature, considering its high success rate and low costs and complication rates, it can be applied as an alternative treatment. In lithotripsy processes for ureteral stones made with rigid URS, the whole system is controlled up to the renal pelvis in many cases. Given this experience, although not the first treatment option, we believe that lithotripsy with rigid URS on selected stones in the renal pelvis can be applied as an alternative treatment.

Especially in less experienced clinics, the biggest drawback of flexible URS is that it can easily malfunction after a certain number and duration of use. As a result, half-life of flexible URS device is shorter and frequently requires repairing (7). Therefore, in selected cases of renal pelvic stones, intrarenal lithotripsy with rigid ureterorenoscopy can bring higher success rates and lower costs. In our study, we concluded thus due to the high success and low complication rates. However, because the number of patients is small in our study, our results may be misleading. Our findings need to be supported by studies in larger series and scales.

There are options like percutaneous nephrolithotomy, flexible ureterorenoscopy and open surgery in the treatment of kidney stones. However, in selected renal pelvic stones, intrarenal lithotripsy with rigid ureterorenoscopy, should also be considered as a low-cost and effective alternative treatment.

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Correspondence/İletişim

Erdoğan AĞLAMİŞ
Elazığ Training and Research Hospital, Department of
Urology, ELAZIG, TURKEY
E-mail: uroloji23@yahoo.com



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