



Bilateral Laparoscopic Pyelolithotomy for Chronic Renal Failure with Giant Kidney Stones: Case Report and Review of Literature

Kronik Böbrek Yetersizliği Tanılı Dev Böbrek Taşlı Olguda Bilateral Laparoskopik Piyelolitotomi: Olgu Sunumu ve Literatürün İncelenmesi

Serkan Akan, Aytaç Şahin, Ayhan Verit

ABSTRACT

Kidneys with large stones associated with chronic renal failure are not rare in areas where stone disease is endemic, such as our country. The high rate of these patients having additional vascular diseases and increased bleeding tendencies can present various difficulties in diagnosis and treatment. Frequent and safe percutaneous nephrolithotomy in contemporary urology may become debatable because of bleeding or nephron loss concerns. We think that laparoscopic pyelolithotomy can be performed safely in such cases.

Keywords: Laparoscopy; pyelolithotomy; renal failure.

ÖZET

Kronik böbrek yetmezliği ile birliktelik gösteren büyük taşlı böbrekler ülkemiz gibi taş hastalığının endemik olduğu bölgelerde nadir değildir. Bu hastaların yüksek oranda ek vasküler hastalıklara sahip olması ve artmış kanama eğilimleri tanı ve tedavide çeşitli zorluklar çıkarabilir. Günümüz ürolojisinde sıklıkla ve güvenle uygulanan perkütan nefrolitotomi gerek kanama gerekse nefron kaybı endişesi ile bu olgular için tartışılabilir hale gelebilir. Biz bu gibi durumlarda laparoskopik piyelolitotominin güvenle uygulanabileceğini düşünüyoruz.

Anahtar sözcükler: Laparoskopi; piyelolitotomi; böbrek yetmezliği.

As the experience of laparoscopic surgery in urology increases, the principle of open renal surgery should be reconsidered. With unique advantages in selected cases, laparoscopic pyelolithotomy (LP) can be a realistic minimally invasive alternative. Here, we present a case with bilateral large renal stones and chronic renal failure that were treated with bilateral LP.

Case Report

A 54-year-old male patient was admitted to our clinic with the right side pain in June 2020. His

history included hypertension, past cerebrovascular event, chronic renal failure, and renal stone disease. When past surgeries were questioned; it was learned that patient had appendectomy, stomach hernia operation, percutaneous transluminal coronary angioplasty and coronary stent application, and ureterorenoscopy (URS) for several times. He was using ramipril 5 mg/24 h, acetylsalicylic acid 300 mg/24 h, and warfarin sodium 5 mg/h regularly. Bilateral costovertebral angle sensitivity was present on physical examination. In laboratory findings;

Department of Urology,
University of Health Sciences,
Fatih Sultan Mehmet
Training and Research
Hospital, İstanbul, Turkey

Cite this article as: Akan S,
Şahin A, Verit A.
Bilateral Laparoscopic
Pyelolithotomy for Chronic
Renal Failure with Giant
Kidney Stones: Case
Report and Review of
Literature. Bosphorus Med J
2022;9(1):63–66.

Received: 27.04.2021

Accepted: 28.05.2021

Correspondence:

Dr. Serkan Akan, Sağlık
Bilimleri Üniversitesi, Fatih
Sultan Mehmet Eğitim ve
Araştırma Hastanesi, Üroloji
Kliniği, İstanbul, Turkey

Phone:

+90 216 578 30 00

e-mail:

drserkanakan@hotmail.com

OPEN ACCESS



This work is licensed under a
Creative Commons Attribution-
NonCommercial 4.0 International
License.

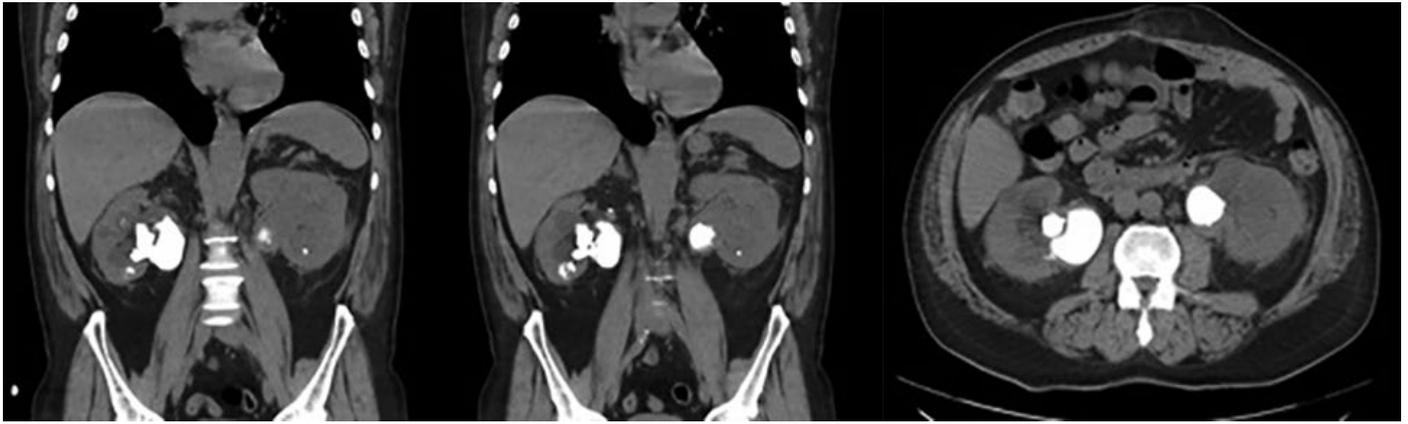


Figure 1. In contrast-free abdominal computed tomography; a staghorn calculus of approximately 71×55 mm in the right kidney covering the entire renal pelvis and extending to the lower pole, approximately 24×21 mm sized calculi at the left kidney renal pelvis and bilateral hydronephrosis were observed.

hemogram: 10.59 g/dL, WBC: 11 K/uL, INR: 2.2 (0.8–1.2), platelet: 400 K/uL, K: 4.8 mEq/L, creatinine: 2.1 mg/dL, and C-reactive protein: 1.36 mg/dL. No bacteria were seen in the urine culture. In contrast-free abdominal computed tomography; a staghorn calculus of approximately 71×55 mm in the right kidney covering the entire renal pelvis and extending to the lower pole, approximately 24×21 mm sized calculi at the left kidney renal pelvis and bilateral hydronephrosis were observed (Fig. 1). Intravenous fluid therapy was initiated with electrolyte follow-up in the hospitalized patient. The treatment of acetylsalicylic acid and warfarin sodium was discontinued due to surgical preparation; enoxaparin sodium 80 mg/24 h was started and patients were consulted with relevant clinics. Patient underwent metabolic examination; no evidence other than hypercalcemia (352 mg in 24-h urine) was detected. Percutaneous nephrostomy was not performed due to bleeding diathesis and renal function was not calculated. Static kidney scintigraphy was performed and right kidney function was reported as 42.1% and left kidney function as 57.8%. All minimally invasive surgical options were evaluated in definitive treatment because of the patient's present comorbidities. Surgical technique to be applied explained to the patient, and his informed consent was obtained. The left and right laparoscopic transperitoneal pyelolithotomy was performed with an interval of 3 weeks. The duration of operation was 108 min for the left LP and 126 min for the right LP. There was no blood transfusion requiring hemorrhage after two operations. Existing drain was removed 24 h after both operations. Patient whose creatinine decreased to 1.6 mg/dL and had no clinical significance except urinary calculus in the right lower pole on the urinary system graphy was discharged on the 4th day after the second operation (Fig. 2). The patient, whose bilateral



Figure 2. Urinary system graphy was discharged on the 4th day after the second operation.

d-j stents were in place, was discharged post-operative 4th week after planning removal of catheters and stone analysis.

Discussion

Many studies have been conducted over the past few years concerning the relationship between kidney stones (nephrolithiasis/urolithiasis) and the development of chronic kidney disease.^[1] Early clinical observations suggest that certain nephrolithiasis conditions (e.g., staghorn calculi) and genetic diseases (e.g., primary hyperoxaluria; dental disease; 2,8-hydroxyadenine crystalluria; cystinuria) are lead-

ing to progressive loss of epidermal growth factor receptor and end-stage renal disease at a younger age.^[2]

At present, minimally invasive methods such as extracorporeal shock wave therapy (ESWL), URS, percutaneous nephrolithotomy (PCNL), and derivative methods are routinely performed in many urology clinics in the treatment of urinary tract stone disease. In addition to these treatment modalities, laparoscopic approaches are also used in recent years. One of these applications was LP that is a new treatment modality which should be kept in mind for patients not eligible for ESWL and PCNL. In the literature, LP can be preferred in cases with complex stone overload, in the previous ESWL, URS, or PCNL failures, in morbid obesity and anatomical anomalies.^[3]

PCNL is contraindicated in patients with abnormal bleeding parameters according to the classical knowledge. Kefer et al.^[4] recommended enoxaparin bridge therapy starting 5 days before PCNL and continuing 5 days after PCNL in patients using warfarin. They reported 7% bleeding complications and an angioembolization in their series. Lange et al.^[5] reported that they completed PCNL treatment without thromboembolic complication by placing transient vena cava filtration in four patients. In conclusion, it is important to note that patients treated with anticoagulants have a significantly higher risk of PCNL complications than those of the normal population, even if the serum parameters are normal, with drug therapy being discontinued and bridge therapy being performed.^[6]

In laparoscopic and robotic surgery, it is possible to have less bleeding by being more controlled and completing the operation in a shorter time by increasing the pressure at the operation site to decrease the venous bleeding or by seeing the anatomical structures more closely.^[7] Although bleeding during PCNL is usually approached conservatively (blood transfusion, closure of the nephroscopy tube, etc.), arterial embolization may be required for unresponsive bleeding from these conservative treatments. On the other hand, LP is one-to-one simulation of open surgery and bleeding is not expected under normal conditions as removal of the stone is not through transparenchymal route.

Since flexible URS and ESWL have a higher success rates for stones smaller than 2 cm, we did not prefer to use this system for our case with a heavier stone burden. We preferred LP administration when we considered the presence of heavy stone burden, worry about minimal renal paren-

chymal loss, increased bleeding tendency, easy access to stones, and the possibility of catching same kidney without stone in one session.

Along with the experience accumulated in laparoscopic surgery; LP-related studies also increase. Recently, in the meta-analysis of Wang et al.;^[8] seven studies were evaluated; the data of 176 LP and 187 PCNL patients were compared. PCNL was found to be advantageous in terms of duration of operation in this study, but LP was more advantageous in terms of bleeding, post-operative fever, and complete stone clearance.

Li et al.^[9] performed randomized controlled trials with 178 patients with all major renal pelvic stones, comparing LP and PCNL in these patients. There were no statistically significant differences in the duration of hospital stay, blood transfusion rate, and complication rates in this study. However, the mean duration of operation and the mean decrease in hemoglobin level were significantly lower in the LP group. Again the full stone cleaning ratio is in favor of LP. According to the literature, a 1.6% loss of renal function was reported in PCNLs applied to staghorn stones.^[10] Although there is no similar randomized study for LP, loss of renal function is not expected because transparenchymal route is not preferred in this surgery.

In conclusion, LP can be applied in selected group of patients such as large renal pelvic stones with ureteropelvic junction stenosis, multiple axes due to stone burden, no suitable position for PCNL, stone resistant to fragmentation, and borderline renal reserve.

Conclusion

As the experience of laparoscopic surgery in urology increases, LP can be a realistic minimally invasive alternative to PCNL in selected cases due to its unique advantages. We think that in the treatment of large renal pelvis stones, LP can be safely applied even if there are serious comorbid conditions.

Disclosures

Informed consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Concept – S.A.; Design – S.A.; Supervision – A.V.; Materials – S.A., A.Ş.; Data collection and/or processing – A.Ş.; Analysis and/or interpretation – S.A., A.Ş.; Literature search – S.A.; Writing – S.A.; Critical review – A.V.

References

1. D'Costa M, Savcic-Kos R, Huang J, Rule AD, Murali N. Urological procedures in urolithiasis and their association with chronic kidney disease. *Clin Med Res* 2016;14:75–82.
2. Rule AD, Bergstralh EJ, Melton LJ 3rd, Li X, Weaver AL, Lieske JC. Kidney stones and the risk for chronic kidney disease. *Clin J Am Soc Nephrol* 2009;4:804–11.
3. Nouralizadeh A, Simforoosh N, Soltani MH, Sarhangnejad R, Ardestanizadeh A, Shabaninia S, et al. Laparoscopic transperitoneal pyelolithotomy for management of staghorn renal calculi. *J Laparoendosc Adv Surg Tech A* 2012;22:61–5.
4. Kefer JC, Turna B, Stein RJ, Desai MM. Safety and efficacy of percutaneous nephrostolithotomy in patients on anticoagulant therapy. *J Urol* 2009;181:144–8.
5. Lange JN, Mufarrij PW, Passman CM, Assimos DG. Safety and efficacy of removable inferior vena cava filters in anticoagulated patients undergoing percutaneous nephrostolithotomy. *J Endourol* 2013;27:168–71.
6. Nerli RB, Reddy MN, Devaraju S, Hiremath MB. Percutaneous nephrolithotomy in patients on chronic anticoagulant/antiplatelet therapy. *Chonnam Med J* 2012;48:103–7.
7. Autorino R, Khalifeh A, Laydner H, Samarasekera D, Rizkala E, Eyraud R, et al. Robot-assisted partial nephrectomy (RAPN) for completely endophytic renal masses: A single institution experience. *BJU Int* 2014;113:762–8.
8. Wang X, Li S, Liu T, Guo Y, Yang Z. Laparoscopic pyelolithotomy compared to percutaneous nephrolithotomy as surgical management for large renal pelvic calculi: A meta-analysis. *J Urol* 2013;190:888–93.
9. Li S, Liu TZ, Wang XH, Zeng XT, Zeng G, Yang ZH, et al. Randomized controlled trial comparing retroperitoneal laparoscopic pyelolithotomy versus percutaneous nephrolithotomy for the treatment of large renal pelvic calculi: A pilot study. *J Endourol* 2014;28:946–50.
10. Preminger GM, Assimos DG, Lingeman JE, Nakada SY, Pearle MS, Wolf JS Jr, et al. Chapter 1: AUA guideline on management of staghorn calculi: Diagnosis and treatment recommendations. *J Urol* 2005;173:1991–2000.