

LAPAROSCOPIC LEFT HEMINEPHRECTOMY IN COMPLETE DOUBLE COLLECTING SYSTEM WITH MULTIPLE UPPER MOEITY KIDNEY STONE

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ABSTRACT

Objectives: Laparoscopic heminephrectomy was firstly reported by Jordan and Winslow in 1993. Laparoscopic heminephrectomy has recently been described as a feasible procedure for the treatment of poorly functioning renal moiety in the duplex kidney. However, this minimally invasive technique is a complex procedure that has remained confined to the hands of experienced teams, with a limited number of reports of relatively few cases. In Indonesia, it has rarely been done. **Material & method:** A 49-year-old male with chief complaint of pain at the left flank for 2 months. From IVU, we found double collecting system with left upper moiety kidney stone. Then we performed laparoscopic left heminephrectomy. **Result:** Operative time was 2 hours 30 minutes with bleeding < 100 mL. Post operative VAS was 3 with paracetamol analgetic. Patient was discharged 5 days after operation without any complaint. **Conclusion:** Laparoscopic heminephrectomy is safe to treat patient with complete double collecting system with multiple upper moiety kidney stone.

Keywords: Heminephrectomy, laparoscopic, intraperitoneal, complete double collecting system, kidney stone.

ABSTRAK

Tujuan: Laparoscopic heminephrectomy pertama kali dilaporkan oleh Jordan dan Winslow pada tahun 1993. Laparoscopic heminephrectomy akhir-akhir ini dideskripsikan sebagai prosedur yang mudah untuk perawatan fungsi ginjal separuh yang kurang baik pada ginjal. bagaimanapun, teknik invasif minimal ini adalah prosedur kompleks yang hanya dapat dikerjakan oleh tangan-tangan tim yang berpengalaman, dengan jumlah terbatas beberapa laporan kasus. Di Indonesia, jarang sekali dilakukan. **Bahan & cara:** Pasien berusia 49 tahun dengan keluhan utama nyeri pada kiri selama 2 bulan. Dari hasil IVU, kami menemukan sistem double collecting dengan batu ginjal separuh atas. Kemudian kami melakukan laparoskopik heminephrectomy kiri. **Hasil:** Lama operasi adalah 2 jam 30 menit dengan pendarahan < 100 mL. Post operative VAS adalah 3 dengan analgesik parasetamol. Pasien dipulangkan 5 hari setelah operasi tanpa keluhan. **Simpulan:** Laparoscopic heminephrectomy aman untuk merawat pasien dengan sistem double collecting lengkap dengan batu ginjal separuh atas multiple.

Kata kunci: Heminephrectomy, laparoscopic, intraperitoneal, sistem double collecting lengkap, batu ginjal.

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INTRODUCTION

Duplex system can be described as the kidney with two pelvicalyceal systems, with either single ureter or bifid ureter (partial ureteral duplication) or double ureter draining separately into the urinary bladder (complete ureteral duplication).¹ The presence of two ipsilateral ureters, believed to be the result of premature branching of the uretric bud during prenatal development.² Duplication of the

ureters, frequently called renal duplication, duplication of the ureter and renal pelvis is the most common anomaly of the upper urinary tract with an incidence of 1 in 125 or 0.8%.²⁻⁴ Patients with ureteral duplication may potentially have urinary stones, ureterocele, vesicoureteral reflux (VUR) and obstructive uropathy.¹ It is frequently asymptomatic but when being symptomatic the most presenting problems are flank pain and urinary tract infection with an atrophic upper pole which may also cause

hypertension.³ The standard surgical treatment of a nonfunctioning symptomatic renal moiety is ipsilateral heminephrectomy. Recent advances in laparoscopic techniques have led to the selection of laparoscopic surgery for many if not most urological procedures. It can be done retroperitoneal or transperitoneally.³

Here, we report our experience in performing laparoscopic heminephrectomy that had been performed in Hasan Sadikin Hospital, Bandung, Indonesia.

OBJECTIVE

To report our experience in performing laparoscopic left heminephrectomy in complete double collecting system with multiple upper moiety kidney stones patient using intraperitoneal approach.

MATERIAL & METHOD

A 49 years old male with chief complaint of left flank pain radiating to left abdomen since 2 months ago. Ultrasonography and intravenous pyelography examinations reveals a left incomplete double collecting system with left hydronephrosis and left upper moiety nephrolithiasis.

General anaesthesia was given to the patient. The patient was placed in a lithotomy position. A cystoscopy camera was inserted into the urethra lumen and approached the bladder. Cystoscopy procedure reveals double left ureteral orifices with efflux from both orifices. A ureteral



Figure 1. Ultrasonography

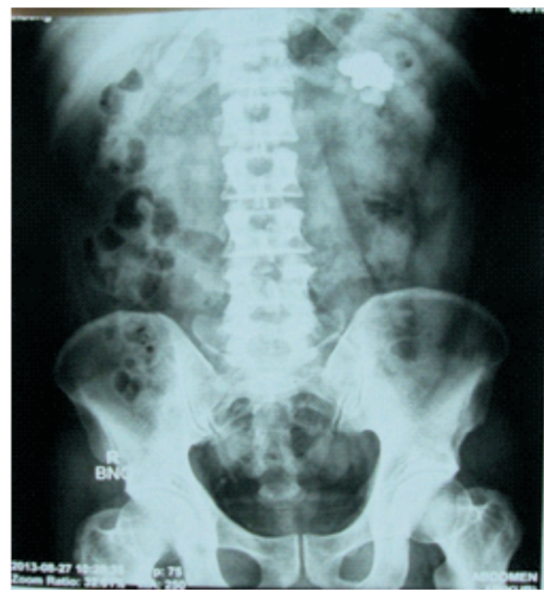


Figure 2. Abdomen X-Ray

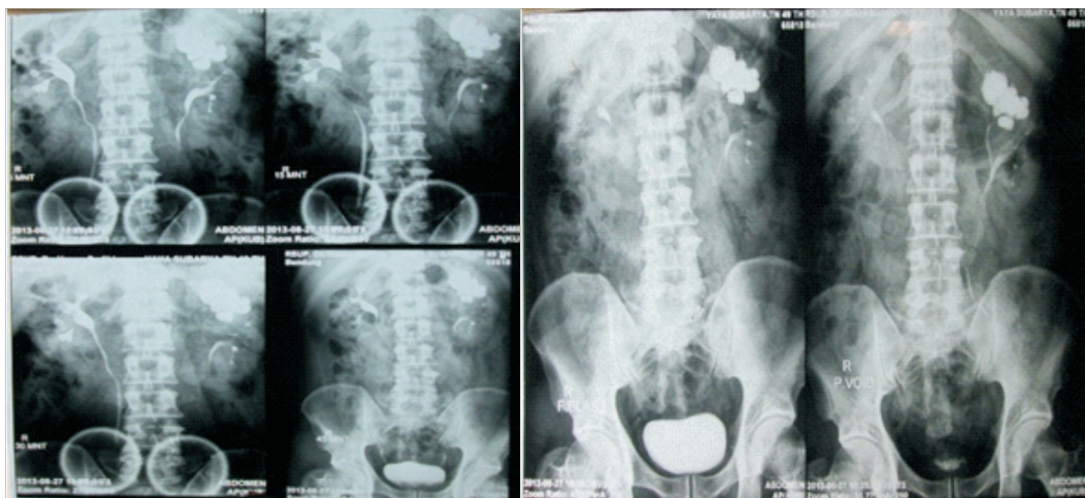


Figure 3. Intravenous Pyelography

catheter was inserted into left ureteral orifice, and RPG C-Arm was done. RPG C-arm confirmed a double collecting system, and after that a DJ stent was inserted into lower pole.

The patient was placed in a lateral decubitus position, the pressure points were carefully padded, and a roll was laced under the pelvis to elevate the affected side. A transverse 5mm skin incision was made at the lower border of the tip of the twelfth rib, and the retroperitoneum was approached by a muscle-splitting blunt dissection. Following development of the retroperitoneal space with a dissection balloon as described by Gaur, a 5mm Hasson trocar was inserted and the retroperitoneum was insufflated with carbon dioxide to a maximum pressure of 10–12 mmHg. The second and third trocars were placed under direct vision in the anterior and posterior axillary line, and a finger width from the top of the iliac crest.

Gerota's fascia was incised and the posterior surface of the kidney dissected using a combination of sharp and blunt dissection, which allowed identification of the adrenal gland and both renal moieties. The left kidney was enlarged, without adhesion to adjacent structure. Accessory artery and vein was found at the upper moiety of the left kidney. The ectopic ureter was traced above and below the renal hilum and isolated from the healthy one, taking care to preserve the structure and irrigation of the last. The renal hilum was approached, but no ligations were performed at this moment since it is hard to identify which vessels supply each pole and an erroneous ligation could compromise areas of unaffected parenchyma or the lower pole ureter.

The first step was upper pole parenchyma incision because demarcation between the affected upper moiety and the healthy lower one was easily established. A harmonic scalpel was used to divide the parenchyma, and the dissection proceeded until the urothelium of the collecting system was entered, which guided further excision and minimized damage of the surrounding structures. After parenchyma incision, the branches of the renal artery and vein supplying the upper pole could be easily

identified, since they and the ureter were the only structures attaching the ablated tissue to the remaining renal parenchyma. Endoscopic clips were used to ligate the vessels separately. Finally, the ectopic ureter was pulled by the site where it was approached at the beginning of the surgery and it was ligated with an endoloop and divided as distal as possible. The resected pole and ureter were placed in an endobag and retrieved directly through a port incision. A drain was left indwelling in the perirenal space, and all port sites were carefully closed.

RESULTS

The duration of operation was 150 minutes. The estimated blood loss was less than 100 cc. No blood transfusion. Drain production was 10 cc/24 hours. Urine production about 2000 cc/24 hours. Post operative VAS was 3 with paracetamol analgetic. Drain was removed 3 days after surgery. There were no significant intraoperative complications. Patient was discharged at day 5 after operation.

DISCUSSION

Double collecting systems (also known as duplex collecting systems) can be defined as renal units containing 2 pyelocaliceal systems that are associated with a single ureter or with double ureters.^{5,11} The 2 ureters empty separately into the bladder or fuse to form a single ureteral orifice. It is a common anomaly of upper urinary tract that conveys a risk of obstruction, stone formation, and can become symptomatic due to urinary tract infection or flank pain.⁶ The most common site affected is the upper moiety. The standard treatment for a duplex kidney with poorly functioning upper pole moiety is ipsilateral upper pole heminephrectomy. In recent days, open surgery procedure has been greatly replaced by laparoscopic procedure, due to lower morbidity compared to open procedure.^{1,12}

Laparoscopic heminephrectomy is minimal invasive procedure optimizing an advance in technology; to replace open surgical procedures that

Table 1. Our result compare to previous studies.

	This Case	Previous Study ¹²
Duration of Operation	150 minutes	142.8 minutes (90 - 195)
Estimated Blood Loss	< 100 cc	196.1 mL (range 20 - 600)
Length of stay	5 days	6.1 days (range 4-10)

convey many complications.⁷ Based on the previous studies, regardless of applied techniques, the main complications of laparoscopic heminephrectomy are urinoma, urine leakage, recurrent urinary tract infections, postoperative hypertension, and functional loss of the remaining moiety.^{8,9} In our case, postoperative complications was unknown due to lack of postoperative follow up time.

The results of laparoscopic heminephrectomy between this case and the other studies are described in table 1. In this case, duration of operation was 150 minutes. Mean duration of operation in previous study was 142.8 minutes. Patient was discharge 5 days after operation, while mean length of stay from previous study ranges from 4-10 days.¹²

There was not any major or minor complication of operation. Operation time was longer than mean operation time in previous study due to lack of surgical experience. Hospital stay was only 5 days which is fewer than previous study.

Laparoscopic heminephrectomy is a complex procedure that has remained confined to the hands of experienced teams, with a limited number of cases.

CONCLUSION

Laparoscopic heminephrectomy is technically feasible and safe. Laparoscopic heminephrectomy has a valuable role in the treatment of duplex kidneys. It can be performed with minimal morbidity and acceptable result. In the future this method could be the preferred means in managing selective case of heminephrectomy over open surgery.

REFERENCES

1. Karakose A, Aydogdu O, Atesci YZ. Unilateral complete ureteral duplication with distal ureteral stone: A rare entity. *Can Urol Assoc J.* 2013;7:E511-E512
2. S B, Venunadan A. Bilateral complete duplication of the ureters: A case report. *Rec Res Sci Tech.* 2011;3:117-118
3. Abedinzadeh M, Nouralizadeh A, Radfar MH, Moslemi MK. Transperitoneal laparoscopic heminephrectomy in duplex kidneys: A one centre experience. *German Medical Science.* 2012;10
4. Peters CA, Schluskel RN, Mendelsohn C. Ectopic ureter, ureterocele, and ureteral anomalies. *Campbell-Walsh Urology.* 2012;4
5. Shankar G, Babu NM, Ramesh S, Srimurthy KR. Transperitoneal laparoscopic heminephrectomy in duplex kidneys: a one centre experience. *J Indian Assoc Pediatric Surg.* 2006
6. Patankar S, Dobhada S, Bhansali M, Case Report: Laparoscopic Heminephrectomy in a Horseshoe Kidney Using Bipolar Energy. *Journal of Endourology.* 2006
7. Agrawal SK, Chipde SS, Agrawal P. Laparoscopic heminephrectomy in nonfunctioning right moiety of a horseshoe kidney: Technical challenges and method to deal with. *Journal of Natural Science, Biology and Medicine.* 2014
8. You D, Shim M, Kim SC, Ha SH, Kwon T, Kim KS. Transperitoneal Laparoscopic Upper Pole Heminephrectomy in Pediatric Patients with Duplex Kidneys: Comparison with an Age-Matched Cohort of Open Surgery. *Korean Journal of Urology.* 2009
9. Haber GP, Gill IS. Laparoscopic Partial Nephrectomy: Contemporary Technique and Outcomes. *European Urology.* 2006
10. Pereira J, Os'orio A, Pinto JM, Rodrigues JC, Enes C, Reis A, and Castro JR. Case Report Upper Pole Nephrectomy: A Simplified Technique Using a Retroperitoneal Laparoscopic Approach. *Case Reports in Urology.* 2011
11. Rui M, Rong-de W, et al. A new classification of duplex kidney based on kidney morphology and management. *Chinese Medical Journal.* 2013
12. Gao Z, Wu J, Lin C, Men C. Transperitoneal laparoscopic heminephrectomy in duplex kidney: our initial experience. *J Urology.* 2011