RETROPERITONEOSCOPIC HEMINEPHRECTOMY: INITIAL EXPERIENCE IN CIPTO MANGUNKUSUMO HOSPITAL JAKARTA

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ABSTRACT

Objectives: *To explain efficacy and feasibility of heminephrectomy laparoscopic with retroperitoneal approach in double collecting system patients with non-functional upper moiety.* ***Material & methods:*** *Three cases in Cipto Mangunkusumo Hospital's urology outpatient clinic from July 2013 - January 2014 with double collecting system and non-functional upper moiety. Laparoscopic heminephrectomy with retroperitoneal approach were done to these patients.* ***Results:*** *Surgery was done within 200 - 240 minutes with minimal bleeding and no significant complication. There was no significant hemodynamic disturbance observed during surgery. Patients were able to mobilize and to get immediate oral intake. Pains were minimal and can be treated with first-line analgesics. The patients were discharged on the fourth and fifth day of hospitalization.* ***Conclusion:*** *We are reporting our initial experience doing retroperitoneoscopic heminephrectomy in double collecting system patient. This procedure was feasible and produced good outcomes for the patients.*

Keywords: *Double collecting system, retroperitoneal laparoscopy, retroperitoneoscopy.*

ABSTRAK

Tujuan: *Menjelaskan efektivitas dan kemampulaksanaan laparoskopi heminefrektomi dengan approach retroperitoneal pada pasien double collecting system dengan non-functional upper moiety.* ***Bahan & cara:*** *Tiga kasus dari polikinik urologi RSCM pada rentang bulan Juli 2013 - Januari 2014 dengan double collecting system dan non fungsi upper moiety. Pada ketiga pasien ini dilakukan tindakan laparoskopi heminefrektomi dengan approach retroperitoneal.* ***Hasil:*** *Tindakan pembedahan berlangsung selama 200 - 240 menit dengan kehilangan darah minimal dan tanpa komplikasi berarti. Tidak terdapat perubahan hemodinamik signifikan selama operasi. Pasca tindakan, pasien dapat mobilisasi dan mendapatkan intake oral sesegera mungkin. Nyeri bersifat minimal dan dapat diatasi dengan analgesia lini pertama. Pasien dipulangkan dari perawatan rumah sakit pada hari keempat dan kelima post operasi.* ***Simpulan:*** *Kami melaporkan pengalaman awal kami melakukan heminefrektomi per retroperitoneoskopi pada pasien dengan double collecting system. Prosedur ini mampu laksana dan menghasilkan keluaran yang baik bagi pasien.*

Kata kunci: *Double collecting system, retroperitoneal laparoscopy, retroperitoneoskopi.*

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INTRODUCTION

Double collecting system is a congenital disorder with renal pelviocalyceal system or moiety was divided into two, alongside with ureteric duplication that could be either partial or complete. This disorder is quite common to be found, with incidence of 0.6-1.8%.[1-3] approximately 20% of the cases were bilateral and more common in woman. Most of the patients were asymptomatic, however non-functional moiety could lead into complications, such as hydronephrosis and hydroureter with recurrent urinary tract infections which need surgery (heminephrectomy).[4-6] In this case series, laparoscopic heminephrectomy with retroperitoneal approach (retroperiteneoscopy) in children with non-functional upper moiety in double collecting system will be discussed further.

OBJECTIVE

This study is aimed to explain efficacy and feasibility of heminephrectomy laparoscopic with retroperitoneal approach in double collecting system patients with non-functional upper moiety.

MATERIAL & METHODS

Case I was a 3-years old boy came into outpatient clinic on July 2013 with recurrent left side abdominal pain. The pain was intermittent with mild intensity and no spreading. There were no hematuria and passing stones during urination. There were no dysuria and fever. Melena was reported and whole body hematomas were observed. The patient was diagnosed with Henoch-Schonlein purpura and was on corticosteroid therapy.

On physical examination, the patient was fully alert, hemodynamically stables, no fever, and had good nutritional status. There were no masses palpated and bowel sounds were normal on abdominal examination. There were no abnormalities on flank, upper symphysis, and external genitalia. There were some purpuras on extremities. Laboratory showed mild leucocytosis (11900/μL), leukocyturia and bacteria in urine. CT urography showed hydronephrosis and hydroureter of upper and lower moiety of left renal with thin upper moiety with left ureterocele (Figure 1).

Case 2 was a 14 years old girl came to outpatient clinic with enuresis since she was born. The patient was still able to feel the urge to urinate

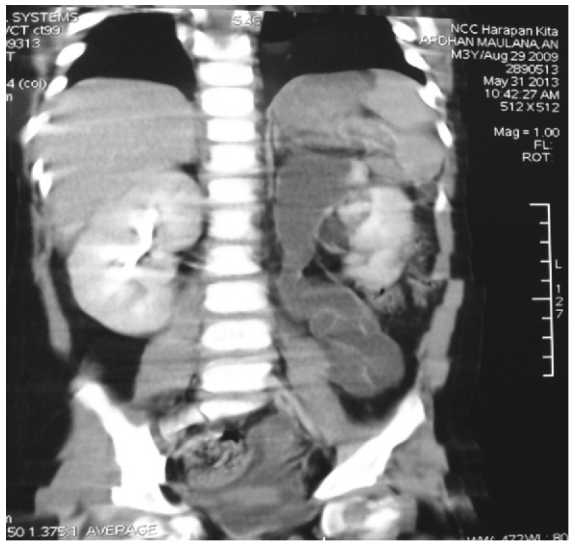

Figure 1. CT urography showing hydronephrosis and hydroureter in both moieties double collecting system of left renal.

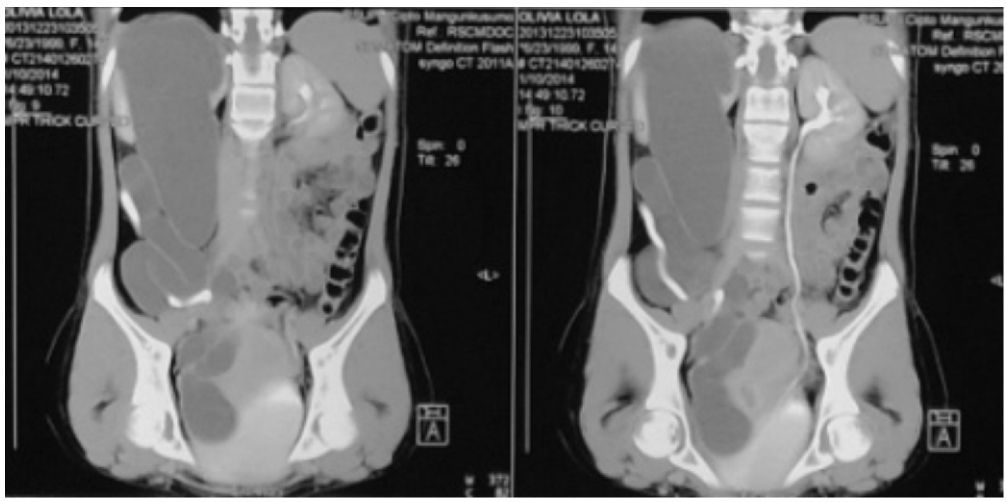

Figure 2. CT urography showed double collecting system of right renal with upper moiety ectopic ureter which ends in vagina.

and able to with stand urination. There were no complains about defecation and movement disorder. Flank pain, dysuria, and fever were denied. The patient had a normal growth and development history. She was in good overall condition, stable vital signs without fever. There were no abnormalities in general examination, no backbones deformity. Urological examination showed urine leakage from external genitalia.

Laboratory examination showed mild leucocytosis (11.000/uL) without urine test abnormalities. CT urography with contrast showed double collecting system of right kidney with ureteric duplication. Ureter from upper moiety ends in vagina while the lower one ends in bladder. Parenchyma of upper moiety was thin with delayed contrast excretion. The left kidney was visualized normal (Figure 2).

Case 3 was a 2 years old girl was consulted from Department of Pediatrics with recurrent urinary tract infection. The patient came to hospital with recurrent fever without any other complaints. Growth and development were normal with good socioeconomic condition. The patient had good general condition with stable vital signs. There were no abnormalities in either general or urology examination.

Laboratory examination showed leucocyturia without other abnormalities. Sonography revealed right renal upper moiety hydronephrosis and hydroureter with thin renal parenchyma. There were no abnormalities in voiding cystourethrography procedure.

Heminephrectomy per retroperitoneal laparoscopic/retroperitoneoscopic was decided to be done in these patients. Before procedure, the patients were consulted to pediatrician and anesthesiologist for pre surgical evaluation. The patients were in minimal fasting condition as possible with clear fluid were still allowed until 2 hours before procedure. Prophylaxis antibiotic was given 30 minutes before surgery.

General and caudal anesthesia was performed and patient was placed in lumbotomy in accordance to upper moiety side that would be excised. Incision was done 1 finger below 12th ribs tip, the first port which 5 mm in diameters was inserted to retroperitoneal cavity. The second port insertion, 3 mm diameters, below 11th ribs tip and the third port size 5 mm above left anterior superior iliac spine with camera guiding (Figure 3). An additional port insertion was done between second and third trochar during procedure on the second patient.

Retroperitoneal fat layer and areolar tissue on the cavity were freed while bleeding was controlled with electrosurgery tools, the harmonic scalpel/thunderbeat to create wide workspace. Dilated ureter were identified, then tracked to cranial direction to identify upper and lower renal moiety. Upper moiety then was freed from surrounding tissue. In order to identify renal upper moiety pedicles, the renal artery and vein were double

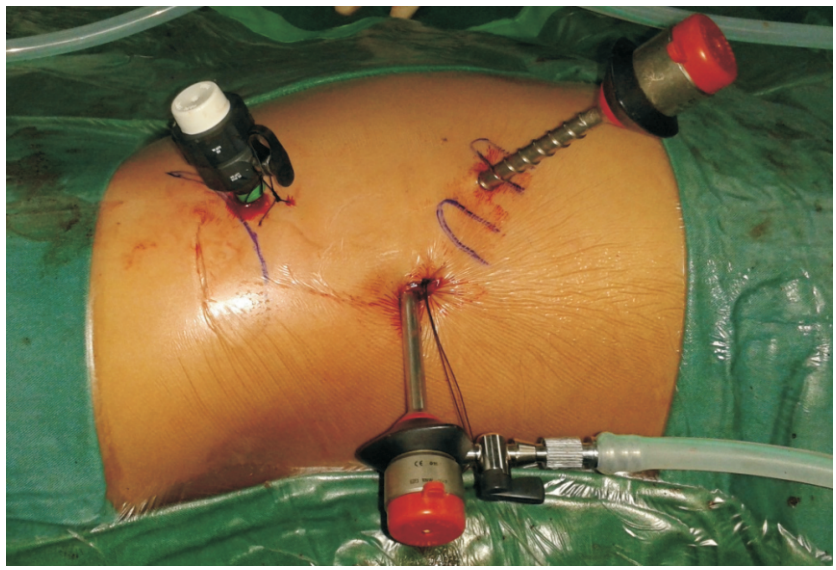

Figure 3. Trochars position retroperitoneoscopic.

clipped separately with hem-o-lok, and then were ligated. The border between upper and lower moiety was excised with electrosurgery tools.

The patients on case 1 and 3, the ureter were excised proximally from iliac artery. The distal punctum of ureter was stitch using vicryl 2.0. Specimen was received from one of the incision. Patient on case 2, the ureter with renal upper moiety was removed through Gibson incision, then was ligated as distal as possible.

Remnant of lower moiety was evaluated to seek urine spillage. Retroperitoneal drain was fixated, desufflation of retroperitoneal cavity was done then surgery incision were closed layer by layer (Figure 4 and 5).

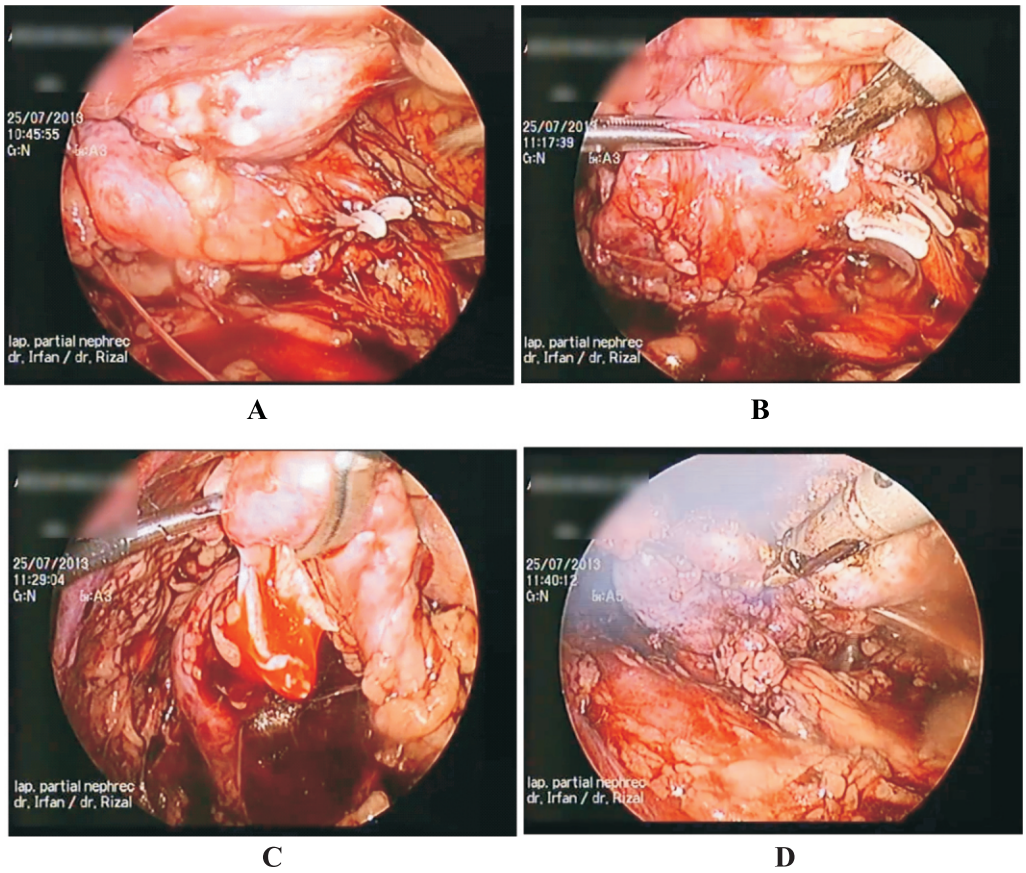

Figure 4. Heminephrectomy step by step. (A) Clipping and ligation of upper moiety artery (B) Clipping and ligation of upper moiety vein (C) upper moiety ureter excision (D) left renal upper moiety excision.

Figure 5. Excised upper moiety.

RESULTS

The patients were allowed to be transferred to the ward after their conditions were stabilized in the recovery room. Patients were able to mobilize and got oral intake as soon as possible gradually. The procedure took 200-240 minutes without conversion to open surgery, with minimal blood loss. There were no hemodynamic disturbances during intervention or other intraoperative complications. During post surgery, patients in case 1 and 3 were pain free with first line analgesics meanwhile patient in case 2 was pain-freed with narcotics therapy from anesthesiologist. On the second day, patient in case 2 was pain free with first line analgesic. Post surgery, patient in case 2 had nausea and vomiting. There were no headache, breathlessness, and bleeding in three patients. Drains production were minimal and were removed on day 2 and day 3 post surgery. Patient 1 and 3 were discharged in day 4 post surgery, while patient 2 in day 5 post surgery (table 1).

DISCUSSION

Retroperitoneoscopy is one of quite developing procedures in urology lately. Since insufflations of retroperitoneal cavity with balloon was developed, the access to retroperitoneal cavity becomes easier and safer and retroperitoneoscopy became one of main choices for urology surgeries, such as renal biopsy, ureter stone, marsupialization of renal cysts, retroperitoneal lymph nodes dissection, spermatic vein ligation, and nephrectomy. Although many studies have shown that retroperitoneoscopy is a feasible procedure with low morbidity, this procedure is only able to be done in centers with advance laparoscopic facility.[7-14]

For heminephrectomy, laparoscopy became the procedure of choice since it was first reported by Jordan and Wislom in 1993. Retroperitoneal approach for heminephrectomy laparoscopy introduced by Gill in 1994 but it applications in pediatric population remains limited because high complication numbers.

As well as laparoscopy, retroperitoneoscopy has many advantages compared to open surgery. It allows anatomic details to be more prominent and blood loss can be minimalized by procedure. After surgery, patients felt less pain and able to mobilize actively sooner. Length of post surgery care significantly shorter compared to open surgery. Moreover, cosmetics value are better because smaller incision.

In this case report, retroperitoneoscopy heminephrectomy were done, which was firstly done in our hospital. Surgery took 200-240 minutes without hemodynamic disturbance, bleeding, and organ injury intra-operatively. Special attention was given during upper moiety pedicles isolation and upper pole tissue excision. There was no complication after surgery, and the patients were able to get oral intake and mobilize as soon as possible.

Table 1. Intra-operative and post-operative findings description.

Parameters	Case 1	Case 2	Case 3
Intra-operative			
Bleeding (cc)	<50	100	< 50
Length of surgery (minute)	210	200	240
Cardio respiratory disturbance	No	No	No
Intra-operative complication	No	No	No
Post-operative			
Pain management	Paracetamol	Narcotics (D +1) Paracetamol (D + 2-5)	Paracetamol
Nausea -vomiting	No	D + 0	No
Oral intake	D + 0	D + 0	D + 0
Shortness of breath	No	No	No
Drain production	Minimal	100 cc (D +1)	Minimal
Fever	No	No	No
Length of hospitalization (days)	4	5	4

*D= day

One of complications from retroperitoneoscopic heminephrectomy is intraoperative bleeding during renal pedicle isolation and ligation. This could happen because smaller operation field, but preventable with careful approach. Careless pedicle control can cause massive bleeding or injury to lower moiety vessels, which further declining moiety's function. Chen et al developed a technique for renal pedicle controlling with good outcome. Ureter in upper moiety was freed maximally, then the ureter was tractioned to diaphragm so upper moiety pedicle was identified better without lower moiety pedicle manipulation.

Another difficult part in heminephrectomy is upper moiety excision. The urine spillage during non-functional moiety release has also been reported from some studies. This spillage could cause perirenal urinoma which additional procedure might be needed for evacuation.

Retroperitoneoscopy has some advantages to transperitoneal laparoscopy. Renal hilum exposure is faster but pedicle control is harder due to limited workspace compared to transperitoneal procedure. Intraperitoneal organs injuries are more preventable and patients are sooner to get oral intake during recovery periods. Retroperitoneoscopy is also procedure of choice in patient with peritonitis or previous abdominal surgery history.

Retroperitoneoscopy has disadvantage compared to transperitoneal laparoscopy in hemodynamic aspect during surgery. Higher carbon dioxide gas concentration enter circulation because abundant alveolar tissues with richer vessels in retroperitoneal cavity. Thus, there is persistent gas absorption although workspace insufflations have been stopped. This may cause respiratory acidosis tends to be higher in retroperitoneoscopy.

CONCLUSION

Retroperitoneoscopic heminephrectomy for non-functional renal case in double collecting system is a feasible procedure with minimal morbidity. With the increasing number of cases and surgeon's experience, this procedure will provide bright future for abnormalities in urology.

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