

RETROPERITONEAL LAPAROSCOPIC DISMEMBERED PYELOPLASTY FOR URETEROPELVIC JUNCTION OBSTRUCTION

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ABSTRACT

Objective: To share our experience of retroperitoneal laparoscopic dismembered pyeloplasty as the treatment of Ureteropelvic Junction Obstruction (UPJO) in Department of Urology, Hasan Sadikin Hospital Bandung. **Material & Methods:** Boy 8 years old came for a chance to relieve mass at both flank region especially at left flank region. From the ultrasonography there were bilateral hydronephrosis. We decided to urethrocystoscopy, bilateral ureteral catheter insertion, bilateral retrograd pyelography guided with c-arm and left retroperitoneal laparoscopic dismembered pyeloplasty. **Results:** Operative time was 240 minutes and blood loss was about 200cc. Double J Stent was used for ureteral stenting. Parenteral ketorolac was given as needed to control the pain. The Visual Analogue Scale (VAS) post operative day 1 until 4 were 6, 4, 2, 2, respectively. Urethral catheter was removed at post operative day 2 and drain was removed at post operative day 3. Operating wound was good. Patient was hospitalization until post operative day 4. Left nephrostomy was removed at postoperative day 7 after there was no leakage, confirmed with left antegrad pyelography. From post operative ultrasonography we found that hydronephrosis at left kidney became almost normal. **Conclusion:** In our opinion that the retroperitoneal laparoscopic dismembered pyeloplasty is an alternative treatment for UPJO. This procedure depends on experience and pristine surgical technique from the surgeon

Keywords: Laparoscopic, ureteropelvic junction obstruction, pyeloplasty.

ABSTRAK

Tujuan: Untuk memaparkan pengalaman kami tentang laparoskopi pyeloplasty dismembered retroperitoneal sebagai manajemen pada pasien Ureteropelvic Junction Obstruction (UPJO) di Bagian Urologi, RSUP Hasan Sadikin Bandung. **Bahan & cara:** Anak laki-laki berusia 8 tahun datang dengan keluhan benjolan di kedua pinggang terutama di sebelah kiri. Hidronefrosis bilateral ditemukan dari hasil ultrasonografi. Pasien ini kemudian diputuskan untuk dilakukan ureterosistostomi, insersi ureter kateter bilateral, retrograde pyelography (RPG) dengan C-arm dan laparoskopi pyeloplasty dismembered retroperitoneal kiri. **Hasil:** Lama operasi 240 menit, perdarahan 200cc. Double J stent digunakan untuk stent ureter kiri. Pasca operasi, untuk mengontrol nyeri pasien digunakan ketorolac intravena. Visual analogue scale (VAS) pasca operasi hari ke-1 hingga hari ke-4 adalah 6, 4, 2, 2. Kateter urethra dilepas pada hari ke-2 pasca operasi dan drain pada hari ke-3 pasca operasi. Kondisi luka baik, kemudian hari ke-4 pasca operasi pasien dipulangkan. Nefrostomi kiri dilepas pada saat kontrol hari ke-7 pasca operasi di poliklinik urologi setelah dikonfirmasi tidak ada kebocoran pada saat dilakukan antegrad pyelography (APG) kiri. Dari ultrasonografi pasca operasi ditemukan penurunan derajat hidronefrosis ginjal kiri hampir seperti normal dibandingkan dengan ultrasonografi sebelum operasi. **Simpulan:** Laparoskopi pyeloplasty dismembered retroperitoneal adalah teknik operasi alternatif untuk manajemen pasien UPJO. Namun, prosedur operasi ini membutuhkan keahlian operator yang baik dan pengalaman masing-masing operator.

Kata kunci: Laparoskopi, ureteropelvic junction obstruction, pyeloplasty.

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INTRODUCTION

Ureteropelvic Junction Obstruction (UPJO) is defined as a partial or total obstruction of the flow

of urine from renal pelvis to proximal ureter that can result in the dilatation of pelvocalices system and the occurrence of progressive renal deterioration, if left untreated.^{1,2}

The etiology of UPJO can be caused by either an intrinsic or extrinsic primary obstruction. In addition, it may be due to a secondary obstruction resulting from other diseases or from a previous surgical treatment.¹

There are some options of operative techniques available for UPJO management: endourology, open operation, and laparoscopy.^{3,4} Currently, however, a pyeloplasty dismembered retroperitoneal laparoscopy is a preferred operative technique because it has a lower morbidity rate, takes a shorter caring time, and needs faster recovery time than an open pyeloplasty operative technique does.^{5,6}

Therefore, we presented our experience in UPJO management by a pyeloplasty dismembered retroperitoneal laparoscopy technique as an alternative for pyeloplasty operation technique at Urology Unit, Bandung Hasan Sadikin Hospital (RSHS).

OBJECTIVE

To share our experience of retroperitoneal laparoscopic dismembered pyeloplasty as the treatment of Ureteropelvic Junction Obstruction (UPJO) in Department of Urology, Hasan Sadikin Hospital Bandung.

MATERIAL & METHOD

UPJO is defined as a partial or total obstruction of the flow of urine from renal pelvis to proximal ureter that can result in the dilatation of pelvocalices system and the occurrence of progressive renal deterioration, if left untreated.^{1,2} It occurred in more than 90% of cases, more often in male than in female, and affected more left kidneys than right ones.⁷ A majority of UPJO causes is a primary obstruction, though the condition may be invisible clinically. It is widely accepted that there is a poorly functioning a dynamic ureter segment immediately below ureteropelvic junction.¹

The etiology of UPJO can be caused by either an intrinsic or extrinsic primary obstruction. In addition, it may be due to a secondary obstruction resulting from other diseases or from a previous surgical treatment.¹ A transformation from a growth factor may involve the abnormality of smooth muscles in obstructed renal pelvis. The lack of muscle fibers is offset by excessive collagen fibers that form fibrosis stenosis. Moreover, an examination on an electron microscopy showed an

intrusion of an intracellular junction needed in coordinating peristaltic wave transmissions. Next, infrequent causes of intrinsic obstruction are ureter polyp and ureter papyloma settled in ureter proximal segment.^{1,7}

Obstruction may be caused by the junction of blood vessels commonly found during an operation in hydronephrosis cases. In 40% of aberrant cases, the inferior accessory vessels of kidney (artery and or vena) crossing 1 or 2 cm above ureter result in an increasing mechanic obstruction as a dilatation of renal ureter between upper and lower hilus vessels. These vessels usually exist in the lower limit of hilus. Compression by inferior cava vena, horseshoe kidney, duplication anomaly, and other rotational anomalies can also lead to UPJO.^{1,7} Secondary UPJO may be caused by a previous surgical intervention for other diseases, e.g., a stone postoperative treatment or a failure in a primary UPJO operation. Moreover, large VUR, rapidly undergoing a dilatation of upper ureter, may be very meandering and consequentially produce a secondary UPJO.^{1,7}

One of the symptoms of children with UPJO is a complaint of protrusion on flank region, occasionally accompanied by pain, nausea, vomiting, and fever. Meanwhile, infants generally do not show such symptoms.³

From a laboratory supporting examination it was found a decrease in renal function, while from a result of ultrasonography it was found a dilatation of pelvocalices system but not that of ureter segment. In addition, it can also be diagnosed by using Intravenous Pyelography (IVP), Computed Tomography (CT), and Magnetic Resonance Imaging (MRI). A renogram nuclear examination is needed to see renal function.³

Historically, open pyeloplasty has become a gold standard of UPJO management for both adults and children, by a total success level of 90-100%.^{4,5,9}

There are some types of Anderson-Heyness dismembered pyeloplasty and nondismembered pyeloplasty, such as y-v plasty, spiral flap, and vertical flap. For the last two decades, UPJO management approach has been developing from open pyeloplasty to various invasive minimal procedures such as endopyelotomy, balloon dilatation, laparoscopic pyeloplasty, and robotic pyeloplasty.^{4,8}

With increasing experience, robotic pyeloplasty has made an easier procedure for the operator, unlike a conventional laparoscopy, which requires

skilled laparoscopy operator.^{4,10}

Pyeloplasty laparoscopy is a secure, effective invasive minimal operative treatment option that follows open definitive surgical repairmen principles and techniques. It is of a high success level by 84-98%.^{11,12} However, in relation to significant decreases in total morbidity, including decreased inconvenience, shorter hospitalization, lower complication level, shorter recovery time, and to cosmetics, it is superior than open pyeloplasty.^{5,6} Its disadvantages include a longer operation than that for open pyeloplasty, and requirement of operator's good technical skill. With a stable increase in both laparoscopic experience and education around the world, laparoscopy may come out to be a new gold standard of UPJO treatment.^{4,12}

The advantages of dismembered technique is the complete excision of stenosis segment and thus reduced recurrences.³

Intraoperative complication includes bleeding, injury on adjacent organs (intestines, liver, spleen, and pancreas), and conversion to open procedures; Postoperative complication includes a formation of adhesion, incisional hernia, infection, and secondary urinoma resulting from persistent leak and insufficient drainage.¹³

Renograms were conducted after 3 month and one year. IVP was conducted 1 year after the operation to seek a patent UPJO, decrease in hydronephrosis degree, and repairmen of drainage. The patient was clinically examined after 3, 6, and 12 months.¹

The case report was on an 8-year old boy who was admitted to RSHS's urologic polyclinic on 6 May 2014 with a complaint of protrusion on both

flanks but particularly on the left one. One year before being admitted, the patient complained that the protrusion was progressively growing. Two weeks before being admitted, he complained that the protrusion got more painful accompanied by intermittent fever. A history of kidney stone, sandy, turbid, and red urine was denied.

Ultrasonography examination showed a dilatation of pelvocalices system in both kidneys. There appeared nohyperechoic lesion with acoustic shadow in both kidneys. Bladder was in normal limits.

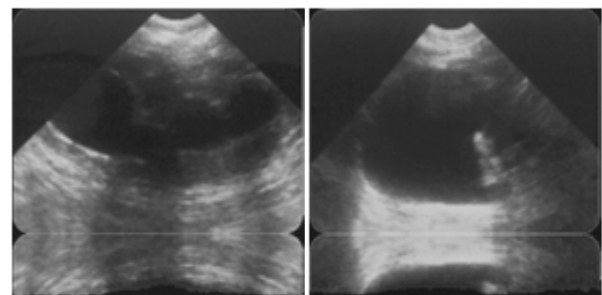


Figure 2. Preoperative right and left renal ultrasonography.

We performed an Operation Uretrosistostomy with Insertion of bilateral catheter ureter and retrograd pyelography (RPG) C-arm bilateral retroperitoneal per Laparoscopic left dismembered pyeloplasty.

During Intraoperative Uretrosistostomy with RPG C-arm bilateral we found the estuaries of external and normal urethras. We found the bladder neck normal. The mucosa bladder was non-

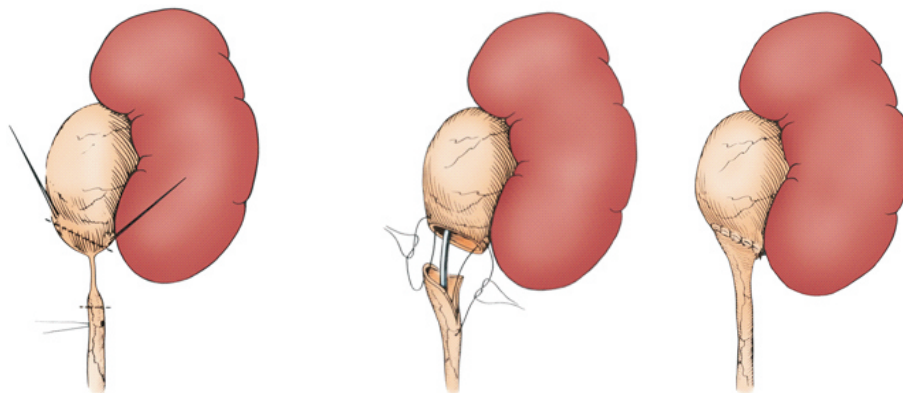


Figure 1. Anderson-Heyness dismembered pyeloplasty technique.³

hyperemi, trabeculation (-), sakula (-), diverticle (-), mass (-), and stone (-). Then we found both estuaries of ureter were identified as normal, efflux +/+, were found. Then we doing Insertion of right catheter ureter and right UPJO impression c-arm RPG were conducted. Followed by Insertion of left catheter ureter and left UPJO impression c-arm RPG were conducted. The laparoscopy of left pyeloplasty dismembered retroperitoneal was determined.

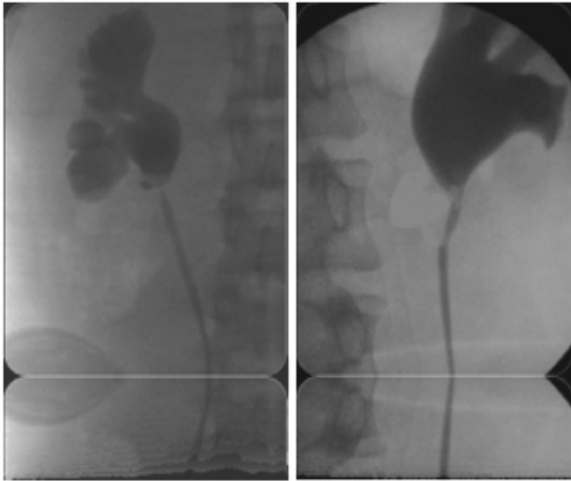


Figure 3. Intraoperative right and left renal c-arm RPG.

During Laparoscopy, Left proximal ureter of normal shape & size was found. Constriction in left ureteropelvic junction was found. Left pyeloplasty dismembered was conducted. Insertion of left stent DJ was conducted. Insertion of left nephrostomy was conducted.

The operation took 240 minutes, with a bleeding of 200cc. Double J stent was used for ureter stent. Postoperatively, an intravenous ketorolac was used to control patient's pain. The urethra catheter and drain were removed on day 2 and day 3 postoperatively, respectively. The wound was in a good condition, and then on day 4 postoperatively the patient was discharged. The left nephrostomy was removed during a control on day 7 postoperatively at the urologic polyclinic after being confirmed that there had been no leakage during conducting a left Antegrad Pyelography (APG). From a postoperative ultrasonography it was found a decrease in left kidney hydronephrosis degree relative to that found in the preoperative ultrasonography.

DISCUSSION

An 8-year old, male patient was admitted with a complaint of protrusion on both flanks, particularly on the left one. The initial diagnosis was found based on anamnesis. Ultrasonographic results

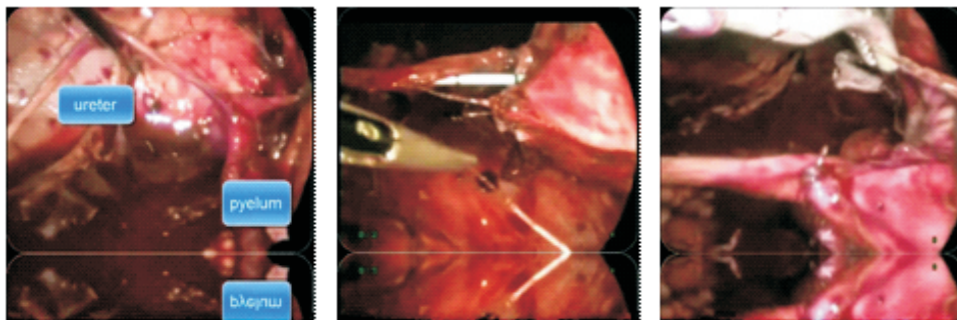


Figure 4. Findings of intraoperative laparoscopy.

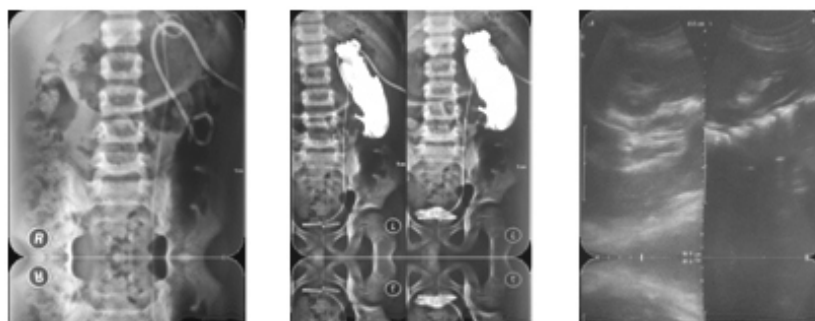


Figure 5. Left APG and left kidney ultrasonography postoperative.

showed that there was a dilatation of pelvocalices system in both kidneys. The patient was then diagnosed as suffering a bilateral hydronephrosis. Based on the examination, it was decided to conduct ureteroscopy + insertion of bilateral catheter ureter and bilateral RPG under c-arm. Based on the diagnostic examination, UPJO was found in both kidneys, and then decided to conduct a laparoscopic action of left pyeloplasty dismembered retroperitoneal. The operation demonstrated that there was a constriction in left ureteropelvic junction.

The postoperative Visual Analogue Scales (VASs) on day 1 to day 4 were 6, 4, 2, 2. Post-operatively, no extravasation was found in left kidney during the examination of left antegrad pyelography. A decrease in hydronephrosis degree was found during conducting an ultrasonography postoperatively in week 2.

Singhania et al. reported 15 cases in India at a success rate of the laparoscopic operations of pyeloplasty dismembered by 93.33%.⁵ Meanwhile, according to Savas et al., the success rate of pyeloplasty dismembered laparoscopic operation of 25 cases in Turkey was 92%.¹⁴

The laparoscopic technique of pyeloplasty dismembered retroperitoneal was one of the operative technique alternatives for managing those patients with UPJO. It is significantly superior in decreasing morbidity rate and postoperative pain, takes shorter hospitalization and recovery times, and with cosmetically better operative wound than an open pyeloplasty operative technique. The technique also has some disadvantages in a longer time of operation and the limitation in the manipulation of retroperitoneal cavity. However, the difference in operational techniques shall be adjusted to each operator's experiences.

CONCLUSION

It was found a case of an 8-year, male patient with a diagnosis of post-ureteroscopy + insertion of a bilateral catheter ureter + RPG c-arm bilateral + a laparoscopy of left pyeloplasty dismembered retroperitoneal on an indication of a hydronephrosis bilateral et causa of bilateral UPJO. The laparoscopic treatment of pyeloplasty dismembered retroperitoneal is a preferred operative technique alternative for UPJO management. The selection was based on the experiences and skills of each operator. At present, the patient is in a good condition and still routinely controlled at the urologic

policlinic scheduled for a cystoscopy + left antegrade double J stent.

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