Case report: a 33-year-old man with recurrent ureteropelvic junction obstruction

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ABSTRACT

Introduction: Ureteropelvic Junction Obstruction (UPJO) is the obstruction of upper urinary tract, present in fetal life until adulthood. Congenital UPJO mostly results from an intrinsic process with dilatation of renal collecting system. Acquired UPJO in adulthood may present without dilatation of renal collecting system, correlated with urolithiasis, infection, postoperative peripyleo-inflammatory fibrotic complication, and urothelial malignancy. In the past, Pyeloplasty, classic dismembered (Anderson-Hynes) or laparoscopic, is the gold standard treatment. In this study we would like to report and discuss comprehensive etiologies, diagnostic, and its treatment based from real case.

Case Presentation: We report case: a 33-year-old Indonesian man with left flank colic pain (VAS: 8/10), nausea, and hematuria that did not disappear with medication. He had stone history in right proximal ureter with hydronephrosis and hydroureter. Ureterorenoscopy had been performed two years ago. Other vital signs and hemodynamics were stable. Abdominal USG demonstrated bilateral hydronephrosis and hydroureter. Abdominal X-Ray showed right ureter stone. Right-Left Ureterorenoscopy + Double-J-Stent were performed. The diagnosis was Bilateral Nephrolithiasis, Stenosis, and Proximal Ureter Obstruction leading to Recurrent UPJO. Three months later there was still pain, the patient was undergone Cystoscopy + URS + Laser Endopyelotomy + DJ-Stent Replacement (from 6 to 7 Fr). One month later, DJ-stents were removed but the stenotic ureter remained so Laparoscopic End-to-End Proximal Ureter Anastomosis Resection and DJ-stent Insertion were finally performed. Patient’s complaints were slightly reduced.

Conclusion: The Recurrent UPJO cause inadequate urinary flow leading to renal impairment. Clinical signs, symptoms, etiologies, and diagnostic imaging have significant role in determining the diagnosis. Early surgical intervention is the definitive treatment to reduce renal damage and its complications. Further researches to establish the causes, clinical manifestations, diagnostic imagings, and alternative treatments of UPJO are highly expected.

Keywords: ureteropelvic junction, recurrent obstruction, end-to-end ureteral anastomosis


INTRODUCTION

Ureteropelvic Junction Obstruction (UPJO) is the most common congenital cause of upper urinary tract obstruction.¹ It might present at any phase of life, fetal, infant, childhood, or adulthood.² This condition could be the most common ureter congenital abnormality, such as obstructive nephropathy, statistically about 1:1.500 of newborns.³ In children, the boys are more often than girls (about 5:2). In adults, it is more common in women than in men. Left UPJO is more often than right (about 5:2). Bilateral UPJO is common in infants and about 10-15% of cases. Allegedly genetic factors also affect UPJO.⁴ Suspected that multicystic renal dysplasia also correlated with Bilateral UPJO.⁵⁶⁷ UPJO is described as severe urinary transport impairment of the renal pelvis to the ureter.⁸

Acquired adulthood UPJO can be accompanied by recurrent flank pain, urinary infection, renal stone, or sometimes other conditions from radiographic imaging incidental findings. UPJO can cause progressive dilatation of pyelum renalithin reduce the kidney function.¹ Pyeloplasty (Dismembered Anderson Hyne’s pyeloplasty) has been the gold standard of UPJO treatment over the past decades.⁹ Recently, Laparoscopic Pyeloplasty (LP) has been introduced as the alternative technique to treat UPJO and has been the new gold standard treatment for UPJO.¹⁰¹¹⁻¹³ Sometimes, UPJO may present without significant pyelum dilatation. In this case, as much as possible, we should be able to maintain the structure of the pyelum by performing a specific original technique named End-to-end ureteral anastomosis. However, Moore (1954) stated that anastomosis might not be useful because the stricture at the location of the anastomosis is almost unavoidable in most cases.¹⁴

This article describes and explains about the aetiology, imaging, diagnosis, and treatment of Uretero-Pelvic Junction Obstruction based from real situation in a patient.

CASE PRESENTATION

We report a case of a 33-year-old Indonesian male who came into the emergency department of our hospital with colic pain in the right abdominal flank since two weeks ago as the main symptom.
The VAS (Visual Analog Scale) was 8/10. Other symptoms were nausea and vomit. For Evaluation, the patient had been performed a computed tomography (MSCT-IVP), the result was: stone in the right ureter (diameter size: 10 mm) same level with Lumbar 4-5. From Abdominal USG examination, there was mild hydronephrosis and hydrourerter on the proximal side of right kidney. This patient also had hypertension, thrombocyte hiperagregation, hyperuricaemia (his uric acid level in blood was 10), hypertriglyceridemia, hypercholesterolemia, and even a smoker as his history. At that time, Ureterorenoscopy (URS) surgery was performed on the patient. By getting additional medical drugs,
the patient discharged from the hospital and the symptoms were temporarily reduced.

About two years after the last URS operation, this man came back to the hospital with same symptom: colic pain, but this time from his left abdominal flank since three days ago. Other symptoms were nausea and bloody urine (hematuria) for one week. He had been given some drugs medication: painkillers (Ketorolac and Fentanyl), antibiotics (Ceftriaxone and Levofloxacin), and antifibrinolytic agents like Tranexamic acid but had not helped enough to relieve his sickness. Other vital signs and laboratory parameters were stable. Some radiographic imagings were performed: The result of Abdominal USG: Bilateral Hydronephrosis and hydroureter, Abdominal X-Ray: Right ureter stone. Right and Left Ureterorenoscopy with Right and Left DJ Stent was performed for this patient, confirmed by post-operation abdominal USG and X-Ray. The post-operation diagnosis was Bilateral Stenosis and Obstruction of Proximal Ureter, leading to Recurrent UPJO.

Three months after the last operation, the patient was programmed to remove the DJ Stent. Right flank Abdominal pain (VAS 4/10) was still felt by the patient, with hematuria and incomplete voiding. Laboratory kidney function parameters were bad (Ureum: 144.8 and Creatinin: 6.88), we consulted this Renal Insufficiency condition to a nephrologist. Cystoscopy + URS + Laser Right Endopyelotomy + DJ Stent Replacement (from 6 Fr to 7 Fr) were performed.

One month later, DJ-stents were removed but the stenotic ureter remained so Laparoscopic End-to-End Proximal Ureter Anastomosis Resection + DJ-stent Insertion [Figure 1a-f,2] were finally performed to this patient. Intravenous Pyelography (IVP) was planned to visualise abnormalities of the urinary tract flow, especially in the UPJ, but it was temporarily postponed because of the laboratory parameters of the kidney function still bad (high ureum and creatinine level of the patient).

We used four ports techniques in lateral decubitus position for performing transperitoneal laparoscopy. To expose the upper ureter and renal pelvis, the colon appeared from the lateral peritoneal attachment. Using blunt and sharp dissection, we released per pelvic and proximal ureter fibrosis gently (did not use electrocautery) [Figure 1a]. Next step after identified the normal ureter, we did dissections of distal segment headed for proximal ureter and renal pelvis. And then we dissected and preserved the lower pole crossing vessel carefully [Figure 1a-b]. Distal ureter was disconnected to fibrotic part, then spatulated enough on the lateral side [Figure 1b-c,2]. No significant swelling of the kidney pelvum identified, so we performed end-to-end ureter anastomosis rather than pyelotomy for this case. End-to-end ureter anastomosis was finally done by interrupted sutures over the DJ stent [Figure 1d-e,2]. Proximal ureter closure using continuous absorbable suture [Figure 1e]. End-to-end ureter anastomosis was performed anterior to crossing vessel. Then we performed drain placement and port closure. Per urethral Foley catheter was maintained for two days. The DJ stent was removed after two months. Subsequently, patient’s complaints were slightly reduced.

DISCUSSION

Pyelo-ureteral junction obstruction in most cases may be the result of the intramural defective fetal smooth muscle or the failure of nerve development leading into the abnormal peristaltic movement in ejective urine from the renal pelvis into the ureter.15 The UPJO physiopathologic events related with the compliant expansion of the renal pelvis which in normal condition has the protecting factor for the renal parenchyma from the increasing intrapelvic pressure-related potential damage, but in more severe stretch it still leads to the rising of intratubular pressure. The stressed tubular cells start the inflammatory reaction by producing chemotactic agents, and followed by the presence of localised inflammatory circulating cells, fibroblast proliferation, myofibroblast activation, up to tubular-interstitial fibrosis, glomerulosclerosis and furthermore, tubular atrophy as a major result of the tubular cells apoptosis.3,7,16-28 We have not found enough evidence and data to prove about the correlation between this theory and the patient’s current condition.

The UPJO majority clinical manifestations: flank pain, nausea, and hematuria; we can find those in this patient. In this case, patient’s risk factors were hypertension, thrombocyte hyperaggregation, hyperuricaemia (his uric acid level in blood was 10), hypertriglyceridemia, hypercholesterolemia, and also a smoker as his history. These conditions could lead into recurrent renal stone formation, but there was not enough evidence to prove it.

When the obstruction pattern in renogram and the differential renal function (split function) is less than 40% are found, the operation might be performed to correct the obstruction.2,3,8,10-14 There was significant decrease of kidney function in this patient, evidenced by laboratory parameters. Diuretic IVP (Intravenous Pyelogram) help enough to make sure the urinary flow of this patient, especially to see the UPJO, but unfortunately we had to postpone the examination because of the laboratory parameters of the kidney function still bad (high level of Ureum and Creatinin). Double-contrast of IVP would cause worst condition of his kidneys if
IVP were forced to do. USG and Abdominal X-Ray are more reliable for this case because of renal impairment. Ensuring drainage system without obstruction is the goal management.

Essential points of endourologic management in handling UPJO based from EAU: (1) Indication of UPJO intervention: if there are symptoms that lead to the obstruction, renal function impairment, stone formation, infection, or hypertension (rare), (2) endoscopic management benefit is intraabdominal avoiding route, but laparoscopic or robotic pyeloplasty still have higher success rates, (3) operative intervention of open, laparoscopic, or robotic methods can be applied to almost any anatomic variation of UPJO, with considering the hydronephrosis degree, ipsilateral renal function, calculi, and crossing vessels, (4) in patients with bleeding after endopyelotomy operator must have a low threshold to proceed to angiography, for minimizing transfusion and operative exploration, leading to nephrectomy. Successful angiographic embolisation can avoid operative exploration.

There are changing of methods by the past few decades to remedy the UPJO. Laparoscopic Pyeloplasty seems to have satisfying result and become an effective method compared to the established open surgical method. The actual alternatives for treating recurrent UPJO without prompting damages to the renal unit are endopyelotomy, balloon dilatation, redo pyeloplasty and ureterocalicostomy. Endopyelotomy used to be widely performed for managing recurrent UPJO until then the laparoscopic approach was considered as a viable option. Nevertheless, because of the success rate is only 40%-70% and the fear of vascular complications, endopyelotomy has not been universally accepted by urologic community. We repeated Right-Left URS+DJ-stent and Laser Endopyelotomy but recurrent bilateral UPJO still remained. Finally, Laparoscopic end-to-end ureteral anastomosis + DJ-stent Insertion was performed as definitive surgical treatment. Open dismembered pyeloplasty is still rated as the gold standard with success rates of 90-95% so far. However, since endoscopic management and laparoscopy give lower morbidity rate and shorter time of hospitalization, they may be considered as leading choices in managing UPJO. In our center, the preferred initial management for this patient is Endopyelotomy + End-to-end Ureter Anastomosis. End-to-end Proximal Ureter Anastomosis Resection was chosen as proper surgery technique for this patient rather than pyeloplasty because there was no significant pyelum dilatation on this patient so we did not need to cut it like pyeloplasty.

This study has some limitations like the timeline to follow up patient’s condition, therapeutic response, and further examination to analyze risk factors and ascertain the definite causes of UPJO.

CONCLUSION

The recurrent UPJO is one of the urological problems that cause inadequate urinary flow leading to renal impairment. Clinical signs and symptoms, etiologies, risk factors, diagnostic imaging have significant role in determining the diagnosis.

Main causes and risk factors those lead to UPJO from this patient are combination between recurrent stone formations, ureteral infection, and post-operative complications/sequele that make fibrotic UPJ, lead to recurrent UPJO.

Early surgical intervention is the definitive treatment to reduce renal damage and its complications. In deciding which method should be used to achieve a successful procedure, we need to consider some factors like the anatomy, past surgical procedures, patient expectations, and the surgeon’s experience.

UPJO still needs to be studied and discovered deeper. Further researches to establish the causes, clinical manifestations, diagnostic imagings, and alternative treatments of UPJO are highly expected.

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REFERENCES


