



Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: <http://www.elsevier.com/locate/eucr>

Pediatrics

Pediatric laparoscopic pyeloplasty of pelvic ectopic kidney with UPJO - A case report

Kobiljon Ergashev^a, Jae Min Chung^{a,b,c,*}, Sang Don Lee^{a,b,c}^a Department of Urology, Pusan National University Yangsan Hospital, Yangsan, South Korea^b Department of Urology, Pusan National University School of Medicine, Yangsan, South Korea^c Research Institute for Convergence of Biomedical Science and Technology, Pusan National University Yangsan Hospital, Yangsan, South Korea

ARTICLE INFO

Keywords:

Pelvic kidney
Ureteropelvic junction obstruction
Laparoscopy

ABSTRACT

Prevalence of pelvic ectopic kidney with obstruction is not common. Associated anomalies may produce technical difficulties and surgical challenges in treatment. Diagnostic tools such as USG KUB, renal scintigraphic studies (DMSA, DTPA), MRI, and preoperative RGP are very informative examinations to properly decide the timing of the operation and method of it. The patient was under close surveillance from the detection of antenatal hydronephrosis until the development of UPJ obstruction. Herein, we report the case of a patient with this anomaly who successfully underwent laparoscopic reconstruction.

Introduction

The fetal kidney ascends to its usual location from its origin in the pelvis in a predictable timeframe between 6 and 9 weeks' gestation.¹ An ectopic kidney can be found in one of the following positions: pelvic, iliac, abdominal, thoracic, and contralateral or crossed.

The reported incidence of renal ectopia varies from 1 in 300 to 1 in 4000 among the pediatric population.² We report a case of a pelvic ectopic kidney with hydronephrosis due to ureteropelvic junction obstruction (UPJO) which is uncommon in clinical practice and its laparoscopic reconstructive management.

Case presentation

The patient was born with antenatally detected hydronephrosis. Postnatal USG-KUB at 1 day old demonstrated the ectopically located pelvic kidney on the left side with the dilated extrarenal pelvis (anteroposterior diameter [APD] = 24 mm) and orthotopic normal right kidney (Fig. 1A). The DMSA renal scan at 7 weeks old checkup showed the relative function of the left ectopic kidney as 27%. The DTPA renal scan was conducted at 5.5 months old and it revealed decreased left renal function (19.5%) without any signs of obstruction.

After that parents were recommended close follow-up with routine

USG-KUB by a pediatric nephrologist. Further, routine follow-up USG-KUB studies were without any significant changes during 3 years. The patient was referred to a pediatric urologist at 3 years old and follow-up DTPA showed significantly decreased relative function on the left (16.6%) with obstruction (Fig. 1B). According to the findings of DTPA, we decided to perform surgery. Before surgery, MRI was performed preoperatively to identify the obstruction site (Fig. 1C).

We performed laparoscopic pyeloplasty with retrograde pyelogram to correct hydronephrotic left ectopic pelvic kidney secondary to UPJO (Fig. 2A). The operation was carried out through a transperitoneal approach. The patient was positioned supine with a 30° upward tilt to the right.

An open umbilical approach was used to create a pneumoperitoneum with a 5-mm, 30° camera port. Working 5-mm ports were placed at the lateral border of the right rectus muscle. The distended renal pelvis was seen bulging through the sigmoid mesocolon. A window was created after the opening of the peritoneum to reveal the pelvis and the UPJO.

After excision and reduction of the pelvis, we tried to find the dependent position of the pelvis. Proper identification of the dependent position in an ectopic environment is one of the difficult steps of the operation, because of renal malrotation and ectopic location. In our case, it was identified according to the renal pelvic peristalsis from right to left and the left-most part of the dismembering line was accepted as

Abbreviations: Ureteropelvic junction, (UPJ); Anteroposterior diameter, (APD); Ultrasonography of the kidneys, ureters, and bladder, (USG-KUB).

* Corresponding author. Department of Urology, Pusan National University School of Medicine, Pusan National University Yangsan Hospital, 20 Geumo-ro, Mujeom-eup, Yangsan, 626-700, South Korea.

E-mail address: busanuro@hanmail.net (J.M. Chung).

<https://doi.org/10.1016/j.eucr.2020.101507>

Received 20 October 2020; Received in revised form 17 November 2020; Accepted 21 November 2020

Available online 23 November 2020

2214-4420/© 2020 Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

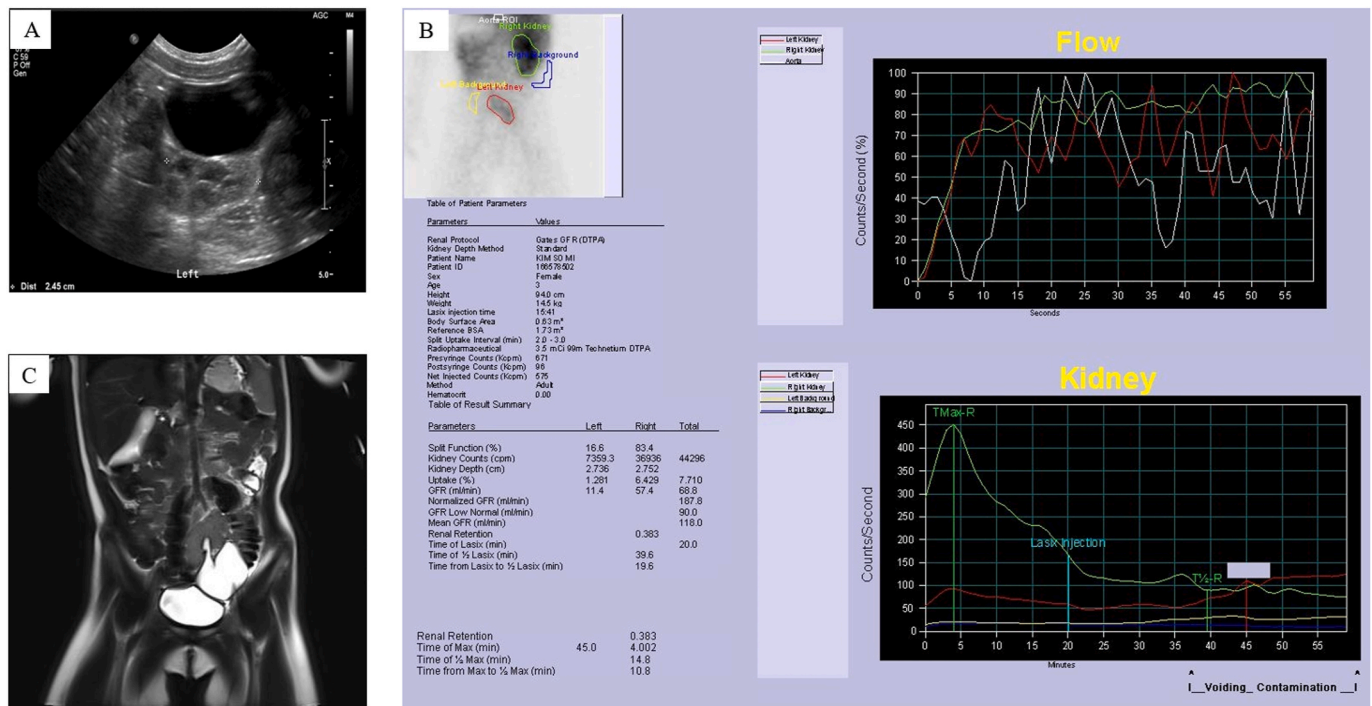


Fig. 1. A, USG-KUB at 1 day old. The left kidney shows an ectopic location in the pelvic area with a dilated pelvis. B, DTPA at 3 years old showing decreased renal differential function with obstruction. C, Preoperative MRI confirming the ectopic location with the dilated pelvis.

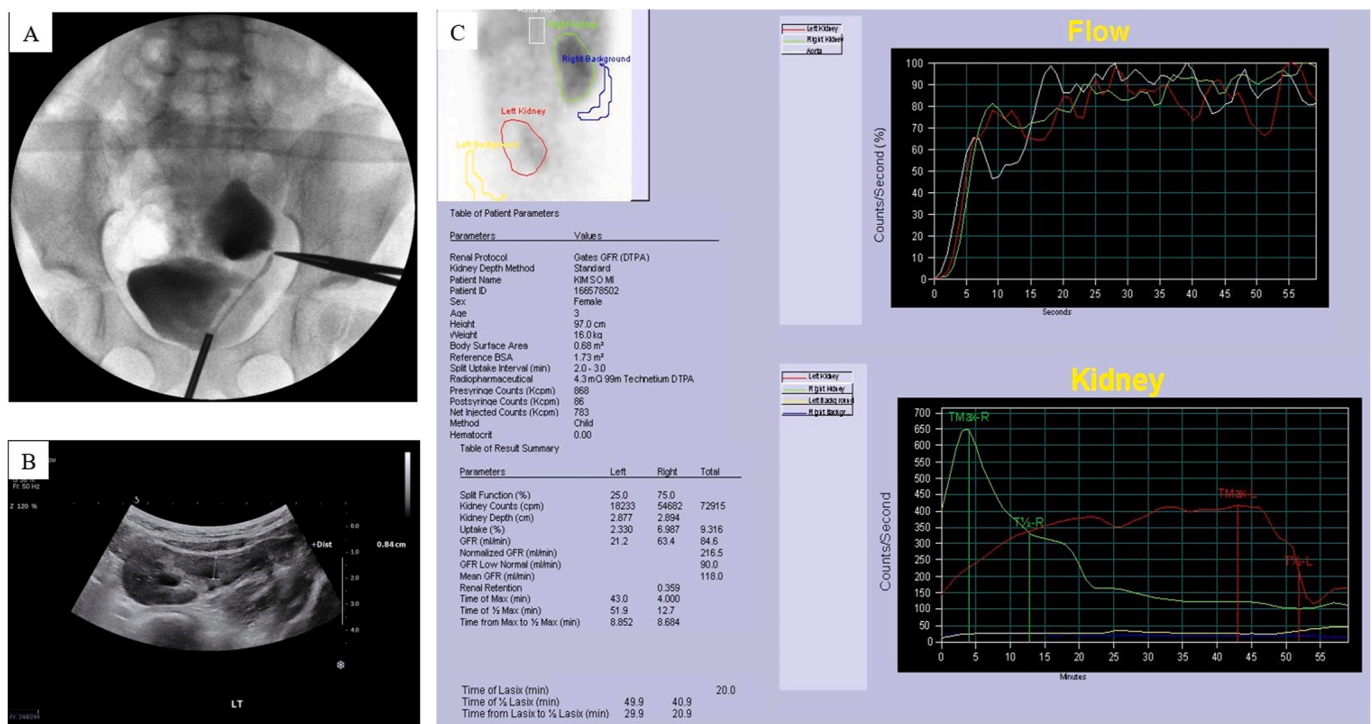


Fig. 2. A, Preoperative RGP identifying the UPJO. B, Postoperative USG-KUB after 3 months showing the significant improvement of pelvic dilation (8 mm). C, Postoperative DTPA confirming improved renal differential function (25% on the right).

the dependent position.

The conventional pyeloplasty was performed which was unsuccessful due to the short length of the ureter. To achieve the tension-free condition and normal urinary drainage, it was decided to perform the anastomosis in an unconventional manner: the non-spatulated side of the ureter brought to the inferior border (dependent position) of the

pelvis, and vertex of the spatulated aspect of the ureter brought to the superior border of the pelvis. The operation was ended with D-J catheter insertion. The operation time was 370 minutes (Video 1).

Supplementary video related to this article can be found at <https://doi.org/10.1016/j.eucr.2020.101507>

A postoperative USG-KUB at 3 months showed a decreased APD

value of 8 mm (preoperatively 24 mm) and a DTPA scan also confirmed the improved renal differential function as 25% without any signs of obstruction (Fig. 2B and C, respectively). Postoperative recovery was uneventful.

Discussion

Hydronephrosis is a common finding in renal anomalies of ascension and rotation. The reported incidence of hydronephrosis in renal anomalies varies from 33% to 50%.^{3,4} Therefore, it may develop from various causes. Gleason et al.⁴ reported that hydronephrosis in renal ectopia resulted from an obstruction in 50% of cases, either at the ureteropelvic or the ureterovesical junction (70% and 30%, respectively), 25% from reflux grade III or greater, and 25% from the malrotation alone. Although the obstructive uropathy is often asymptomatic, some patients may visit the clinic with complaints such as urinary tract infection, abdominal pain, fever, palpable abdominal mass, and hematuria. The asymptomatic course of obstructive uropathy may lead to the loss of renal parenchyma and decreased renal function. Our current case is also a good example of the development of hydronephrosis in the ectopic pelvic kidney due to UPJO with decreased function.

This patient did not need surgical treatment initially, because there was not any evidence of obstruction. Our explanation for the decreased renal differential function is that it might be the result of the ectopic position of the left kidney. For that reason, the operation was delayed and the patient was under close observation and follow-up during the first three years of life. However, consequential follow-up renal scan revealed aggravation of obstruction at the ureteropelvic junction and decreased renal differential function. Therefore, this patient got delayed surgery.

Nowadays laparoscopic reconstruction of the UPJO has already become a routine procedure and conventional way of treatment.⁵ But accompanying renal abnormalities of ascension, fusion, rotation, and/or vasculature and associated anomalies such as UPJO, ureterovesical junction obstruction, or VUR create additional and/or unexpected technical difficulties and surgical challenges. The current case is also no exception from this point of view. The patient had an ectopically located pelvic kidney with UPJO. Because of the ectopic location and malrotation of the kidney, the first difficulty we had encountered was how to identify the upper and lower poles. This problem was solved according to the renal pelvis peristalsis from right to left. In addition to this, anastomosis was completed successfully only in the second attempt due to the tension on the ureter. This unexpected issue was overcome by applying modification to the conventional pyeloplasty: instead of a spatulated ureteral vertex, the non-spatulated side of the ureter was brought to the dependent position.

Conclusion

Relying on just USG-KUB may not be enough for clinical decision making and timing of the management. In spite of abnormal location and surgical challenges, laparoscopic dismembered pyeloplasty is safe and feasible in the reconstructive management of the ectopic pelvic kidney in children.

Authors contribution

KE: Conceptualization, Investigation, Resources, Writing - Original Draft. CJM: Conceptualization, Methodology, Data Curation, Supervision. LSD: Supervision. All authors have read and approved the final manuscript.

Consent

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

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.eucr.2020.101507>.

References

- VanderBrink BA, Reddy PP. Anomalies of the upper urinary tract. In: Partin AW, Dmochowski RR, Kavoussi LR, eds. *Peters CA. Campbell-Walsh-Wein Urology*. twelfth ed. Philadelphia: Elsevier; 2020:1769–1780.
- Magak P, King CH, Ireri E, Kadzo H, Ouma JH, Muchiri EM. High prevalence of ectopic kidney in Coast Province, Kenya. *Trop Med Int Health*. 2004;9(5):595–600. <https://doi.org/10.1111/j.1365-3156.2004.01228.x>.
- Kramer SA, Kelalis PP. Ureteropelvic junction obstruction in children with renal ectopy. *J Urol*. 1984;90(5):331–336.
- Gleason PE, Kelalis PP, Husmann DA, Kramer SA. Hydronephrosis in renal ectopia: incidence, etiology and significance. *J Urol*. 1994;151(6):1660–1661. [https://doi.org/10.1016/s0022-5347\(17\)35338-7](https://doi.org/10.1016/s0022-5347(17)35338-7).
- Muller CO, Blanc T, Peycelon M, El Ghoneimi A. Laparoscopic treatment of ureteropelvic junction obstruction in five pediatric cases of pelvic kidneys. *J Pediatr Urol*. 2015;11(6):353. <https://doi.org/10.1016/j.jpuro.2015.04.042>. e1-353.e3535.