

Author's Affiliation:

¹Department of Urology, JN Medical College, KLE Academy of Higher Education and Research, KLES Kidney Foundation, KLES Dr. Prabhakar Kore Hospital & M.R.C., Belgaum, Karnataka 590010, India.

^{2,5,6}Department of Urology, KLES Kidney Foundation, KLES Dr. Prabhakar Kore Hospital, Belgaum, Karnataka 590010, India.

^{3,4}Department of Urology, JN Medical College, KLE Academy of Higher Education and Research, Belgaum, Karnataka 590010, India.

Corresponding Author:

R. B. Nerli,

Department of Urology,
JN Medical College, KLE Academy of Higher Education and Research, KLES Kidney Foundation, KLES Dr. Prabhakar Kore Hospital & M.R.C, Belgaum, Karnataka 590010, India.

E-mail: rbnerli@gmail.com

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Ureteropelvic Junction Obstruction in an Ectopic Pelvic Kidney

R.B. Nerli¹, Shridhar C. Ghagane², Shankar K.³, Vishal Kadeli⁴, Neeraj S. Dixit⁵, Murigendra B. Hiremath⁶

Abstract

Introduction: The most common type of ectopic kidney is the pelvic kidney, whereby the organ remains in the pelvic cavity. In many patients the condition of renal ectopic remains undiagnosed throughout their life. UPJO is the commonest associated problem. We reviewed the case records of patients presenting with an UPJO in an ectopic pelvic kidney. We also assessed the feasibility and safety of laparoscopic repair of UPJO. **Materials & Methods:** We retrospectively reviewed the case records of patients presenting to us with UPJO in a pelvic or ectopic kidney. The age, gender, presenting symptoms, clinical signs, images treatment records were noted and analyzed. **Results:** During the period Jan 2011 to Dec 2015, a total of 15 patients (11 female and 4 male) with a mean age of 21.7 ± 5.11 yrs. (Range 9 to 33) underwent pyeloplasty for a pelvic ectopic kidney. The laparoscopic approach was successful in 9/12 (75%) patients. Conversion to open surgery (dismembered pyeloplasty) was necessary in the remaining three. In the three other patients, an open pyeloplasty was performed. **Conclusions:** Surgery remains the major form of treatment in these patients with UPJO. Laparoscopic approach seems a useful option for the treatment UPJO. Laparoscopic approach to ectopic pelvic kidneys with UPJO is feasible, safe and effective.

Keywords: Ectopic; Kidney; UPJ Obstruction; Laparoscopy.

Introduction

Ectopic kidneys are defined as those that fail to migrate to their normal position during the embryo's life. The most common type of this conditions is the pelvic kidney, whereby the organ remains in the pelvic cavity. The renal pelvis is anteriorly located and presents with a myriad of abnormal vessels originating from both the aorta and the iliac arteries [1]. The incidence of ectopic pelvic kidney occurring on one side is estimated to be 1 out of 2200-3000 newborns, whereas in a solitary

pelvic kidney it is 1 in 22000 [2]. In most patients the condition remains undiagnosed throughout their life [3]. The diagnosis is only made following the onset of Ureteropelvic Junction Obstruction (UPJO), with or without stone formation. UPJO is one of the most common conditions, occurring in 22% to 37% of cases of pelvic Kidney. Exact cause is not known, but could occur because of a true UPJ cause, or it may be either because of malrotation and/or high ureteral insertion [2].

UPJO in an ectopic kidney presents with a wide spectrum of disorders, varying from renal

dysplasia to severe obstruction. This could later get complicated by urinary stones [4]. The ectopic kidney is quite often associated with other congenital malformations such as skeletal, cardiovascular, pulmonary and genital system malformations (cryptorchidism, hypospadias). Rokitansky-Mayer-Kuster-Hauser syndrome is frequently seen in girls with ectopic kidneys [5]. In this study we report our series of patients with UPJO in a pelvic kidney. In this study we report our experience in the management of UPJO in an ectopic pelvic kidney.

Materials & Methods

We retrospectively reviewed the case records of patients presenting to us with UPJO in a pelvic ectopic kidney. Permission was obtained from the Institutional/University ethical committee to collect, analyze and publish the hospital data. The age, gender, presenting symptoms, clinical signs, images (Figure 1) and treatment records were noted and analyzed.

Results

During the period Jan 2011 to Dec 2015, a total of 15 patients (11 female and 4 male) with a mean age of 21.7 ± 5.11 yrs. Underwent pyeloplasty for a pelvic ectopic kidney. Pain in lower abdomen was the most common presenting symptom. Pain was colicky in nature and occasionally was dull aching. Mass/swelling in lower abdomen was the second most common presenting symptom. Fever with chills, pyuria and dysuria were the other symptoms. In two females a diagnosis of ovarian cyst with torsion was made and patients were taken up for exploration [6]. On exploration the cystic lesions were made out to be dilated renal pelvis, abdomen was closed and the patients referred to the Dept. of Urology for further management. One of these patients was pregnant and was managed with



Fig. 1: CT showing dilated pelvicalyceal with kidney situated in ectopic position.

double J (DJ) stenting till the end of her pregnancy. The other patient underwent DJ stenting as she developed fever and had pyuria.

Abdominal sonography delineated cystic masses, with contents being clear and the ipsilateral kidney being absent in its normal position. Computed tomography (CT) revealed the dilated pelvicalyceal system with the kidney situated in the ectopic position. Three of these patients had associated renal calculi in the dilated collecting system. None of the patients in our series had a solitary pelvic kidney.

In twelve of these patients, it was decided to go ahead with laparoscopic pyeloplasty (Figure 2). Decision of choosing laparoscopic option was based on economic reasons. Laparoscopic pyeloplasty was successful in nine of these twelve patients and conversion to open surgery was necessary in the remaining three. The mean operating time for laparoscopic pyeloplasty was 97.09 ± 13.76 mins (range 80 – 210).

In the three other patients, an open pyeloplasty was performed (Figure 3). The renal calculi were extracted during the procedure be it open or laparoscopic [7]. No major intra or post-operative complications were noted. Post-operative DTPA radioisotope scan was done three months after the surgery. Adequate drainage was noted in all the patients.

Discussion

The actual incidence of simple renal ectopia among autopsy series varies from 1 in 500 to 1

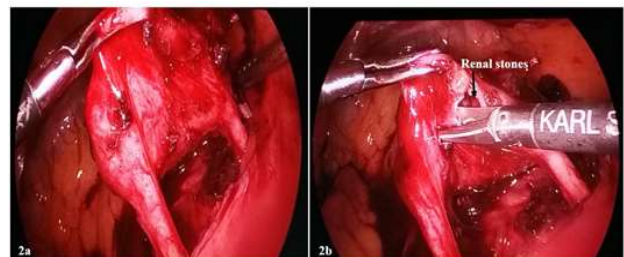


Fig. 2: Laparoscopic pyeloplasty.



Fig. 3: Open pyeloplasty.

in 1200 [1], with an average occurrence of about 1 in 900 with no significant difference between the sexes [1]. Clinically, renal ectopia is more commonly diagnosed in females because they are more apt to undergo urologic evaluation for urinary tract infection (UTI) and/or associated genital anomalies [1]. The ectopic kidney is more commonly seen on the left side. Pelvic ectopia has been estimated to occur in 1 of 2100 to 3000 autopsies [1]. A solitary ectopic kidney occurs in 1 of 22,000 autopsies [1]. Bilateral ectopic kidneys are more rarely observed and account for only 10% of all patients with renal ectopia [1].

The classification of ectopia is based on the position of the kidney within the retroperitoneum. The pelvic kidney opposite the sacrum and the kidneys below the aortic bifurcation are the most common sites of ectopia; the lumbar kidney resides near the sacral promontory in the iliac fossa and anterior to the iliac vessels, and the abdominal kidney is above the iliac crest and is adjacent to the second lumbar vertebra [1]. The length of the ureter usually conforms to the position of the kidney; the ureter is occasionally slightly tortuous but it is rarely redundant. The ureter usually enters the bladder on the ipsilateral side with its orifice positioned normally, except for those unusual cases with ectopic ureters [8].

The ectopic kidney is no more susceptible to disease than the orthotopic kidney, except for the development of hydro-nephrosis or stones [9]. This may be a result of the anteriorly placed pelvis and malrotation of the kidney, which may impair drainage of urine from a high insertion of the ureter to the pelvis or anomalous vasculature that partially obstructs one of the major calyces or the upper ureter. In addition, there may be an increased risk of injury from blunt abdominal trauma, because the low-lying kidney is not protected by the rib cage [9].

Traditionally pelvic kidneys and their anomalies were approached through the open surgical approach. Open surgery for pelvic kidney reduces the level of comfort to the operating surgeon. With the introduction of laparoscopy, the benefits of minimally invasive surgical approaches has been extended to pelvic kidneys too Gupta et al. [10] assessed the feasibility and safety of laparoscopic approach to pelvic kidneys for both ablative as well as reconstructive surgery. Six patients with pelvic kidney were selected, of which two underwent dismembered pyeloplasty, two underwent pyelolithotomy and two underwent nephrectomy through the laparoscopic approach. One of these needed conversion to open and there were no major post-operative complications. Similarly

Marte et al. [11] assessed the feasibility of the laparoscopic approach in 14 children. Nine of these had UPJ obstruction (3 cases had coexisting renal pelvic stones), three had nonfunctioning kidneys and two had congenital hypo-dysplastic kidneys. Five patients with UPJO underwent laparoscopic dismembered pyeloplasty and 4 pelvic derotation with straightening of the uretero-pelvic junction. The remaining five patients with non or poorly functioning kidneys underwent laparoscopic nephrectomy.

Aron et al. [12] reported on a case of UPJO in an ectopic pelvic kidney wherein they performed an endopyelotomy. The authors opined that antegrade endopyelotomy was a safe and effective treatment for UPJ obstruction associated with pelvic kidney. Nayyar et al. [13] reported on successful use of robotic assisted technology to treat a case of UPJO with calculi in an ectopic pelvic kidney in a 55 year old male. In our series laparoscopic approach was successful in treating UPJO in an ectopic pelvic kidney in 75% of the cases [14]. A pelvic kidney has the renal pelvis facing anteriorly with a number of renal vessels originating from aorta and iliac vessels. It becomes difficult to approach the UPJ as the space is less.

Conclusions

Ectopic kidney is an abnormal localization of a kidney due to a developmental anomaly. Ectopic pelvic kidneys present a large spectrum of symptoms. UPJ obstruction with/without stones, remains the major cause of concern in these patients. Surgery remains the major form of treatment in these patients with UPJO. Laparoscopic approach seems a useful option for the treatment UPJO. Laparoscopic approach to ectopic pelvic kidneys with UPJO is feasible, safe and effective.

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