



Received: 2015.05.09
Accepted: 2015.05.30
Published: 2015.09.09

Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Data Interpretation
- E** Manuscript Preparation
- F** Literature Search
- G** Funds Collection

An Ectopic Pelvic Kidney

Rohit Bhoil^{A,B,C,D,E,F}, Dinesh Sood^G, Yash Paul Singh^G, Kshama Nimkar^{E,F},
Anurag Shukla^G

Department of Radiology, Dr. Rajendra Prasad Government Medical College, Tanda, Kangra, Himachal Pradesh, India

Author's address: Rohit Bhoil, Department of Radiology, Dr. Rajendra Prasad Government Medical College, Tanda, Kangra, Himachal Pradesh, India, e-mail: rohitbhoil@gmail.com

Background:

If a kidney does not ascend as it should in normal fetal development, it remains in the pelvic area and is called a pelvic kidney. Often a person with a pelvic kidney will go through his/her whole life unaware of this condition, unless it is discovered during neonatal kidney ultrasound screening or if complications arise later in life due to this or a completely different reason and the condition is noted during investigations. Generally, this is not a harmful condition but it can lead to complications like in our case. With appropriate testing and treatment, if needed, an ectopic kidney should cause no serious long-term health complications and all that may be required for the patient is reassurance with advice to follow up at regular intervals.

Case Report:

A 28-year-old male presented with recurrent pain in his lower left abdomen for one month and an episode of hematuria 3 days earlier accompanied by an attack of acute pain lasting for 3-4 hours. He gave a history of passing 2 small (about 5 mm each) calculi in his urine after the occurrence of hematuria, following which pain decreased in intensity. No history of fever was present.

Conclusions:

Although a simple ectopic kidney seldom causes symptoms, the association of malrotation of the renal pelvis with calculus increases the risk of hematuria and/or hydronephrosis, presenting with colicky pain as in the present case. The clinician should be aware of these in such a case.

If asymptomatic, no treatment is required. However, the patient should be advised to have follow-up ultrasounds at regular intervals to detect complications like calculus, hydronephrosis, etc. With appropriate testing and treatment, if required, an ectopic kidney should not cause serious long-term health complications.

MeSH Keywords:

Hydronephrosis • Kidney Calculi • Urinary Calculi

PDF file:

<http://www.polradiol.com/abstract/index/idArt/894603>

Background

Renal ectopia is defined as an atypically placed kidney due to faulty migration from the fetal pelvis during embryologic development [1]. Ectopic kidney may be abdominal, lumbar or pelvic, based on its position in the retroperitoneum [2]. It can be placed either ipsilaterally or contralaterally, when it is called crossed renal ectopia.

The incidence of ectopic kidneys is 1:12,000 clinical and 1:900 postmortem cases [1], indicating clinically benign significance of this usually asymptomatic aberration.

A simple ectopic kidney is usually asymptomatic. However, if malrotated there is a risk of calculus formation with

consequent hydronephrosis which may present as colicky pain and hematuria, as also seen in our case.

Case Report

A 28-year-old male presented with recurrent pain in his lower left abdomen present for one month and an episode of hematuria 3 days earlier, accompanied by an attack of acute pain lasting for 3-4 hours. He gave a history of passing 2 small (about 5 mm each) calculi in his urine after the occurrence of hematuria, following which pain decreased in intensity. No history of fever was present.

Routine blood tests were normal except for erythrocyte sedimentation rate which was slightly raised (38 mm/hr,

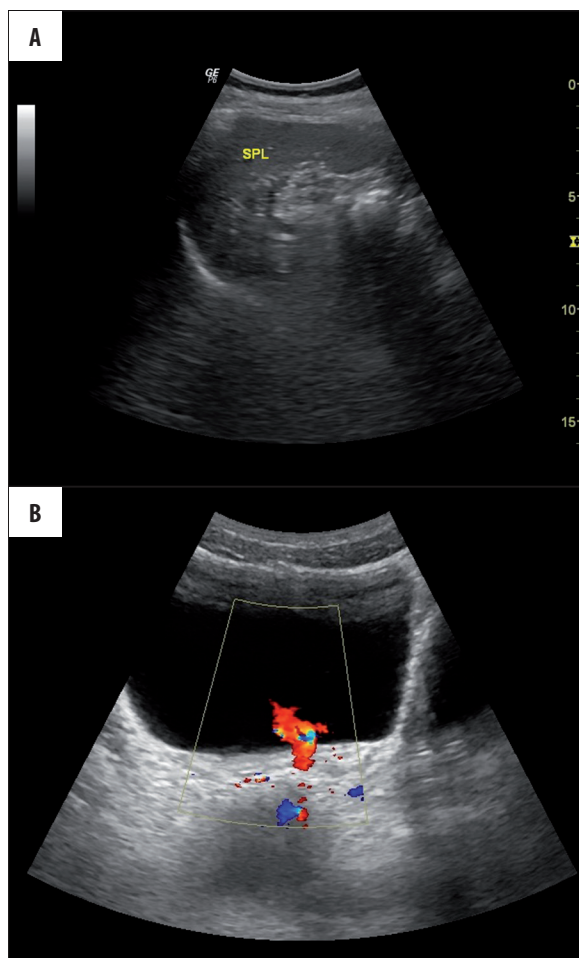


Figure 1. (A) Transverse ultrasound of the left hypochondrium showing absent kidney in the left renal fossa. (SPL – spleen). (B) Color Doppler transverse ultrasound of the urinary bladder showing a jet of urine emerging from the left uretero-vesical junction.

Westergren method). Urine was sterile and serum creatinine and urea were within normal limits. The kidneys/ureter/bladder x-ray was unremarkable. An emergency ultrasound scan of the abdomen was reported as non-visualization of the left kidney in the left renal region (Figure 1A), or elsewhere in the abdomen (examination was limited due to presence of excessive bowel gases). During scan of the urinary bladder which was normal in outline a jet of urine was seen emerging from the left uretero-vesical junction which was confirmed on color Doppler examination (Figure 1B). These sonographic findings led to the impression of an ectopically located left kidney.

Subsequently, an IVP (intravenous pyelogram) was requested. It revealed that the left kidney was not located in its normal anatomical position and was instead found at the level of L4, L5 and S1 vertebrae, slightly to the left of the midline (Figure 2).

It was smaller compared to the right kidney, measuring 10 cm vertically, 7 cm transversally, and 3.5 cm in thickness (right kidney measured 14×10×4.5 cm). This ectopic kidney was slightly malrotated with its pelvis oriented



Figure 2. Intravenous pyelogram showing the ectopic location of the left kidney at the level of L4, L5 and S1 vertebrae. Right kidney was normal in location. Bilateral ureters are also visualised. Contrast is also seen in the urinary bladder.

anteromedially. The long axis passed inferiomedially. It showed normal excretion on IVP.

The right kidney was normal in size, site and function. No calculus or hydronephrosis was seen. Both ureters were normal with contrast opacification and were opening into the bladder. The left ureter was, however, shorter in its course. The urinary bladder showed normal contrast opacification and on emptying, no significant residual urine was seen.

As the patient did not present with any other complaint, he was discharged with the advice of follow-up ultrasound scans and to report back in case of similar complaints in future.

Discussion

The definitive kidney originates from metanephros, which is located in the sacral region [3]. During subsequent embryological development, both kidneys typically ascend to the lumbar region due to the differential growth of the abdominal wall. An ectopic location is a result of arrested migration [4].

During superior migration, the kidneys pass through a fork formed by the umbilical arteries [5]. Initially, the renal hilum faces anteriorly but with rotation of the kidney the hilum comes to face medially. This process of renal ascent is accomplished around the 10th week of pregnancy [6].

An ectopic kidney may be asymptomatic and may function normally even though it is not in a usual position. In such cases, it is noticed incidentally during investigations done for other reasons. However, an ectopic kidney, though benign from the clinical point of view, may have future consequences. It may be associated with other congenital anomalies involving the skeletal, genito-urinary and cardiovascular systems [4,6]. Numerous anomalies of the female reproductive system may also be seen [7].

The most common signs and symptoms related to an ectopic kidney that lead to diagnosis include urinary-tract infections, abdominal pain or a lump that can be felt in the abdomen [8]. The risk of hydronephrosis may be increased in renal ectopia due to malrotation of the kidney and anteriorly placed renal pelvis leading to impaired urinary drainage [9]. Sometimes, urine flows backward from the bladder to the kidney leading to vesicoureteral reflux (VUR) and consequent scarring. Conditions like infection and renal calculus can affect the ectopic kidney leading to a non-classic abdominal pain. These are also prone to traumatic injuries due to their abnormal location in the retroperitoneum.

References:

1. Meizner I, Yitzhak M, Levi A et al: Fetal pelvic kidney: a challenge in prenatal diagnosis? *Ultrasound Obstet Gynecol*, 1995; 5: 391–93
2. Bauer SB: Anomalies of the kidney and ureteropelvic junction. In: Walsh PW, Retik AB, Vaughan Ed Jr (eds.), *Campbell's Urology*, 7th ed. Philadelphia: Wb Saunders Company, 1998; 1709–55
3. Arrieta MU, Trapote RA, Lizarraga DA: Renal position and fusion anomalies. *Ann Pediatr (Barc)*, 2011; 75: 329–33
4. Diaz G: Renal ectopy; report of a case of crossed ectopy without fusion, with fixation of the kidney in normal position by the extraperitoneal route. *J Int Coll Surg*, 1953; 19: 158–69
5. Hunziker M, Kutasy B, D'Asta F, Puri P: Urinary tract anomalies associated with high grade primary vesicoureteral reflux. *Pediatr Surg Int*, 2012; 28: 201–4
6. Lin VC, Weng HC, Kian-Lim E et al: An atrophic crossed fused kidney with an ectopic vaginal ureter causing urine incontinence. *Urology*, 2010; 76: 55–56
7. Kumar S, Bolla SR, Vollala VR: Unilateral ectopic kidney in the pelvis--a case report. *Chang Gung Med J*, 2011; 34: 10–12
8. Gulsun M, Balkanci F, Cekirge S, Deger A: Pelvic kidney with an unusual blood supply: angiographic findings. *Surg Radiol Anat*, 2000; 22: 59–61
9. Cinman NM, Okeke Z, Smith AD: Pelvic kidney: associated diseases and treatment. *J Endourol*, 2007; 21: 836–42
10. van den Bosch CM, van Wijk JA, Beckers GM et al: Urological and nephrological findings of renal ectopia. *J Urol*, 2010; 183: 1574–78

Treatment options depend upon the presence of symptoms or complications. No treatment for an ectopic kidney is required if urinary function is normal and no obstruction to the urine flow is present [10]. If an obstruction is present, surgery may be required for correction of the location of the kidney to allow better drainage of urine. Reflux can be corrected by surgery to alter the course of the ureter. In case of extensive renal damage, nephrectomy is indicated.

Conclusions

Although a simple ectopic kidney seldom causes symptoms, the association of malrotation of the renal pelvis with calculus increases the risk of hematuria and/or hydronephrosis, presenting with colicky pain as in the present case. The clinician should be aware of these in such a case.

If asymptomatic, no treatment is required. However, the patient should be advised to have follow-up ultrasounds at regular intervals to detect complications like calculus, hydronephrosis, etc. With appropriate testing and treatment, if required, an ectopic kidney should not cause serious long-term health complications.

Conflict of interest

None.