

Bilateral Ectopic Kidneys Presenting as Lower Abdominal Pain

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Abstract

Background: Bilateral Ectopic Kidney is uncommon and usually diagnosed during a routine medical checkup. It could be misdiagnosed as an abdominopelvic mass. In-depth knowledge of its presentation will aid in its management. A poor anatomical relation of the kidneys with other abdominopelvic organs could lead to renal complications and surgical errors. This is of gynaecological importance and worthy of discussion for a lady of her reproductive age. **Case presentation:** A 20-year-old nulliparous lady of African descent presented with a long-standing history of dull lower abdominal pain. The pain has been intermittent and occasionally associated with a sensation of movement in the lower abdomen. She has a regular and normal menstrual cycle and has no lower urinary tract symptoms. Physical examination was unremarkable with intact secondary sexual characteristics. The abdomen was soft, non-tender and without any organomegaly. Abdominal ultrasonography, renal pyelogram and urinalysis were carried out after her consent was sought in accordance with the institution's protocol. Urine analysis was normal and culture was negative. However further imaging revealed a bilateral pelvic ectopic kidney. **Conclusion:** Most of the cases reported are usually unilateral ectopic kidneys. It is, therefore, our belief that this information will be useful to medical practitioners such as surgeons, urologists, radiologists and gynaecologists. Such a diagnosis will enable clinicians to follow up with the client and preserve the renal function whiles preventing iatrogenic injuries during surgical procedures.

Keywords

Case Report, Bilateral Ectopic Kidney, Lower Abdominal Pain, Abdominal Ultrasonography

1. Introduction

Embryologically, the kidneys develop in the pelvis and migrate to their normal anatomical position in the upper abdomen. As a result, the kidney is often associated with various anomalies such as shape, position, size and rotation. Anomalies of the kidneys are mostly asymptomatic and the specific clinical findings on the ectopic kidney are often absent. However, clinical recognition is estimated to be only 1 in 10,000 patients generally [1] and even rare in some populations [2]. The case of bilateral ectopic kidneys worldwide is uncommon and is rarely reported.

Ectopic kidney is normally seen as incidental findings during urological physical examination or diagnostic procedures such as Ultrasonography, Computed Tomography (CT) scan, Intravenous Urography (IVU) and Magnetic Resonance Imaging (MRI). Even though ectopic kidney could be located at the thoracic, iliac fossa and lumbar regions [3], it is commonly seen in the pelvic region [4]. Pelvic ectopic kidney sometimes confuses inexperienced sonographers and surgeons and could be mistaken as the pelvic tumour. Ectopic kidney has always been linked with other abnormalities such as agenesis of the contralateral kidney, vascular malformation and genital anomalies [5] [6]. Hydronephrosis, urinary tract infection and renal lithiasis are complications associated with the ectopic kidney [1]. This case report is intended to highlight the rare incidence of bilateral renal ectopia in a patient with recurrent lower abdominal pain and to raise clinician awareness of this condition.

2. Case Presentation

A 20-year-old nulliparous otherwise healthy lady presented with long-standing dull intermittent lower abdominal pain. She has no lower urinary tract symptoms neither was there any association with her menstrual cycle nor her bowel movement. She had no past medical history of significance. With the exception of the mother who was hypertensive well controlled on a single agent, the rest of the family history was unremarkable.

Her vital signs reveal a blood pressure of 100/60mmhg, pulse 68 beats/minute a body mass index of 26.6. Abdomen was soft, non-tender, and without any organomegaly and rest of physical examination was essentially normal. Urine microscopy, culture and sensitivity test; and serum beta human chorionic gonadotropin were all negative. Incidentally, the ultrasound examination revealed bilateral ectopic kidneys with both renal fossae empty. The left kidney was found in the umbilical region adjacent to the umbilicus and the right was located at the right iliac fossa, an indication of bilateral kidney ectopia. The following are the ultrasound scan images compiled (**Figures 1-4**). Both kidneys measured approximately 9×4 cm and there was no hydronephrosis or calculi detected. Ejection of urine from ureters into the urinary bladder was demonstrated during the pelvic ultrasound indicating that at least a unit of the kidneys is functioning. Reproductive organs were present and normal without any abnormality detected. Her serum urea, creatinine and electrolytes levels were within normal limits.

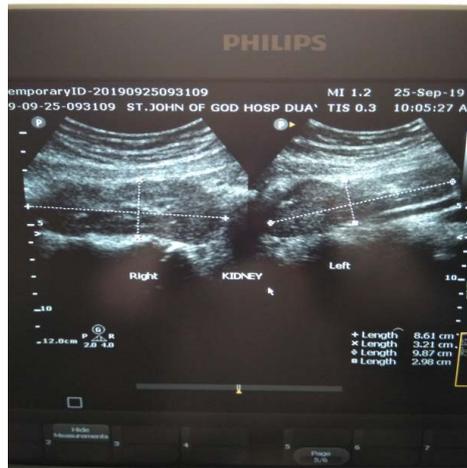


Figure 1. Shows longitudinal view of right and left kidneys located at the right iliac fossa and umbilical region respectively.

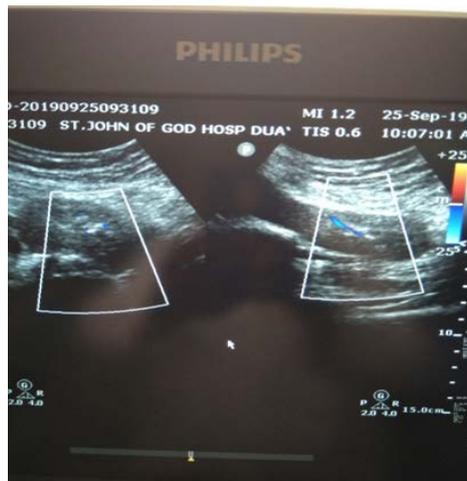


Figure 2. Shows transverse view of right and left kidneys located at the right iliac fossa and umbilical region respectively.

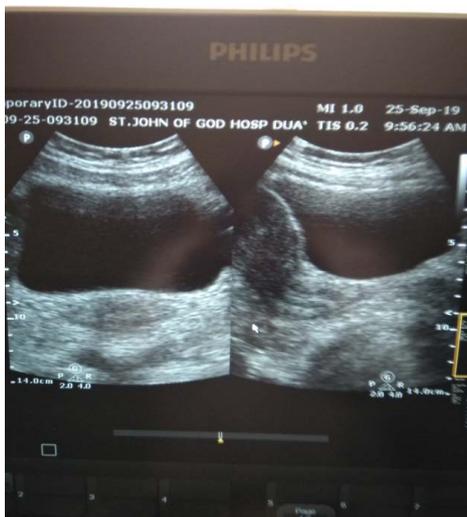


Figure 3. Shows full urinary bladder indicating normal ejection of urine.

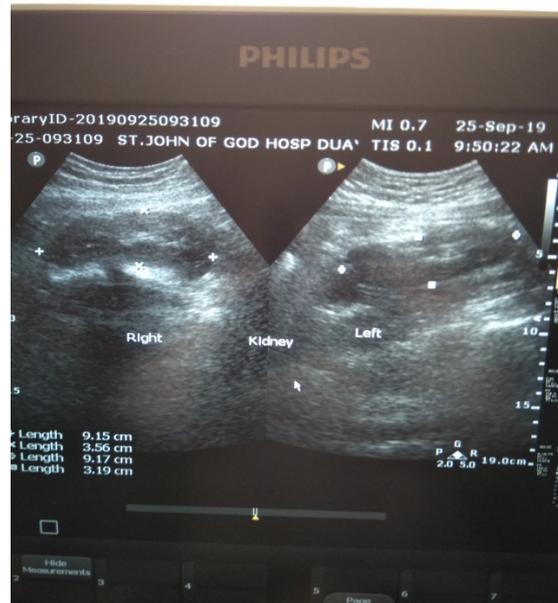


Figure 4. Indicates both ectopic kidneys.

We proceeded to assess individual kidney function by an Intravenous Urography (IVU). Images were obtained from the IVU as shown in **Figures 5-9**. An adequate preparation was made on the client abdomen prior to examination (**Figure 5**). The study showed a prompt nephrogram and excretory phases on the left kidney (**Figure 7** and **Figure 8**) and associated malrotation as evident from the anterior position of the drainage system. However, there was absent nephrogram and excretion of contrast material on the right. The prone view (**Figure 9**) could not demonstrate the right kidney and ureter. These findings were suggestive of a solitary functioning (left) kidney in a bilateral ectopic kidney. The cause of the non-functioning right kidney was not apparent from our studies and due to limitations both financial and logistics in a third world district hospital, a Dimercaptosuccinic acid (DMSA) or other form of radionuclide imaging could not be done. Client did not require any intervention and is currently on six monthly follow up with repeats abdominopelvic ultrasound. Efforts have been made to ensure that she maintains healthy lifestyle in order to preserve function of the solitary kidney and also to avoid nephrotoxic medications. The client has since been enrolled into the urology clinic for this routine follow up and efforts are being made to screen her parents and other siblings for possible renal anomalies. The recurrent abdominal pain is managed with acetaminophen, warm compress at the abdomen and regular exercise regimen.

3. Discussion

The kidneys are paired organs located at the retroperitoneum with the right kidney usually lower than the left for the sake of the bulk of the liver. Each kidney is approximately three vertebrae in length. This can be used to gauge any changes in size when interpreting radiographs. Each kidney moves in a vertical



Figure 5. Indicates control film.



Figure 6. Shows immediate film taken.



Figure 7. Shows 10 min film with compression.



Figure 8. Shows 20 min film with release.



Figure 9. Indicates prone film.

range of 2 cm during the full respiratory excursion of the diaphragm [7]. The Left kidney which is usually located at T11-T12 has the upper pole overlies the eleventh rib was situated anterior at the umbilical region almost sitting on the urinary bladder.

An ectopic kidney is classified as unilateral or bilateral when one or both kidneys are misplaced respectively. It could be classified as thoracic, abdominal, lumbar or pelvic kidney based on its anatomical location. The thoracic cavity and the bilateral ectopic kidney are very uncommon hence are rarely reported [8]. Pelvic ectopic kidney is seen in an estimated 1 of 2100 to 3000 necropsies [9]. Nephroptotic or floating kidneys could be misdiagnosed as ectopic kidneys.

It occurs more often in very thin people whose adipose capsule or renal fascia is deficient and can predispose to hydronephrosis due to kinking of the ureter.

Congenital abnormalities of the kidneys can arise as a result of abnormal development of the ureteral bud and a defect in metanephric tissue during embryogenesis. This can be due to maternally related ailments, genetic anomalies and teratogenicity [5]. Most congenital renal abnormalities are compatible with life and are asymptomatic. However, complications such as hydronephrosis, calculi disease, recurrent pyelonephritis and chronic pain may prompt clinical evaluation of underlying renal abnormality [6] [10].

Most renal anomalies are detected incidentally, usually during evaluation for an abdominopelvic-related complaint [11]. The abnormal relation with other intra-abdominal and pelvic organs may also cause symptoms related to the organ such as urgency due to compression of the urinary bladder and foetal growth restriction from compression of a gravid by an ectopic pelvic kidney. It is also important for surgeons to know of such anatomical anomaly before it is mistaken for abnormal growth or tumour and more importantly prevent iatrogenic injuries to the urinary tract.

In the case under consideration, both kidneys are in ectopic sites, the abdomen and the pelvis with the left abdominal kidney also having malrotation. As under ascent is more common than over-ascent, ectopic kidneys are more commonly found in the pelvis or lower abdomen [7].

Among earlier researchers, few have reported on bilateral ectopic kidneys, their relations with other structures and existence with other morbidities and anomalies. The cases reported vary in representation. In Sudan [12] reported on bilateral pelvic kidneys with upper pole fusion and malrotation on a 36-year-old female Sudanese patient. The patient presented with a long history of recurrent urinary tract infections unresponsive to antibiotics. They observed that a recurrent urinary tract infection without a known cause may be suggestive of renal anomaly and should be investigated expediently. In Nigeria [13] also reported on a 42-year-old male who presented with bilateral, fused pelvic, ectopic, laterally rotated kidneys with acute unilateral flank pain. This was like our case was incidentally discovered with the similar presentation but sex and age difference.

Also, [14] reported on a case with bilateral ectopic kidney and vascular anomaly that is associated with hypertension and renal dysfunction in a 67-year-old woman. A report on ureteropelvic junction obstruction coexisting with renal calculi in children was demonstrated [15]. In another vein, [16] reported on rare comorbidities of crossed fused renal ectopia, Thrombocytopenia and Absent Radius (TAR) syndrome.

In the present case report, the bilateral ectopic kidney is incidentally seen in a young lady in her fertility age. Further diagnostic measures have to be carried out and the needed treatment rendered to avert potential complications.

This case report confirms how subtle renal anatomical abnormality could be present. It is imperative that thorough clinical assessment and basic imaging are carried out even in resource-stricken third-world countries in order to diagnose

such anatomical abnormalities. This will assist in risk stratification of the client and measures can be instituted to better preserve renal function.

Declaration

Ethics Approval and Consent to Participate

Ethical approval is not applicable but the client willingly consented to participate in this case report.

Consent for Publication

The client provided written informed consent for the publication of this report and it is available on request.

Availability of Data and Material

All figures and data used during the current case report are provided in a separate document.

Authors' Contributions

BA and TB: Managed the patient, reported the case, collected background information, and compiled the manuscript for publicity. **EOS:** Provided clinical advice and reviewed the report. All authors have read and approved the manuscript as its true state.

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Conflicts of Interest

We declare that we have no conflicts of interest.

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List of Abbreviations

BEK—Bilateral Ectopic kidney

CT—Computed Tomography

IVU—Intravenous Urography

MRI—Magnetic Resonance Imaging