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Pelvic Kidney – Unexpected Encounters

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Summary

In this article we report 5 cases of pelvic kidney, which were encountered at the Institute of Maternal & Child Health, Calicut over a period of 3 months, from September to December 1999. They were found during the course of laparotomy for various gynaecologic or obstetric conditions. Only one case had been diagnosed prior to surgery. The need to have a high index of suspicion during pelvic surgery is highlighted.

This article reports the detection of 5 cases of pelvic kidney over 3 months in IMCH, Calicut. It highlights the need for greater awareness regarding this condition, especially since it is associated with Mullerian anomalies in a high percentage of cases. While usually asymptomatic, it may lead to serious complications, including its inadvertent removal as a pelvic neoplasm. These can usually be avoided by use of modern imaging techniques.

Case 1

A 23 yr old woman presented with lower abdominal pain and distension. On examination a large mass was felt filling the entire pelvis. She was taken up for exploratory surgery, suspecting an ovarian tumour. At laparotomy, uterus and adnexae were found to be normal, but the pelvis was filled by a large cystic mass distorting the normal anatomy. As dissection proceeded, the structure was identified, by means of its pedicle, to be a pelvic kidney, which was grossly hydronephrotic. The urologist was called in and performed Henderson's pyeloplasty. The patient recovered well. She reported back in September 1999 with a 10 weeks intrauterine gestation, which, however, miscarried.

Case 2

A 25 yr old primigravida was admitted to the labour room with labour pains. LSCS was done for dysfunctional labour. After delivery of the fetus, the uterus was found to be unicornuate with a rudimentary right horn and tube attached to some soft tissue structure in the pelvis. The left tube was normal. There was a right-sided retroperitoneal firm pelvic mass, found to be a right pelvic kidney. The other kidney was normal.

Case 3

A 30 – yr old woman, on routine investigation for infertility, was found on USG to have a bicornuate uterus and a right-sided unascended kidney. She carried the pregnancy till 38 weeks when she developed PROM. An LSCS was performed since the fetus was in an oblique

lie. The above findings were confirmed. The left kidney was normal.

Case 4

A 21 yr old, $G_3P_2L_2$, with a history of 1 LSCS was admitted with labour pains and with the fetus in flexed breech presentation. An LSCS was done. After delivery of the fetus, a left sided pelvic kidney was found. The other kidney was normal, as were the uterus and tubes.

Case 5

A 50 yr old, P_4L_4 was admitted with lower abdominal pain, and mass. On evaluation, she was found to have an ovarian cyst. At laparotomy, a large twisted left ovarian cyst was found, after the removal of which a left sided pelvic kidney was identified. The other kidney was normal.

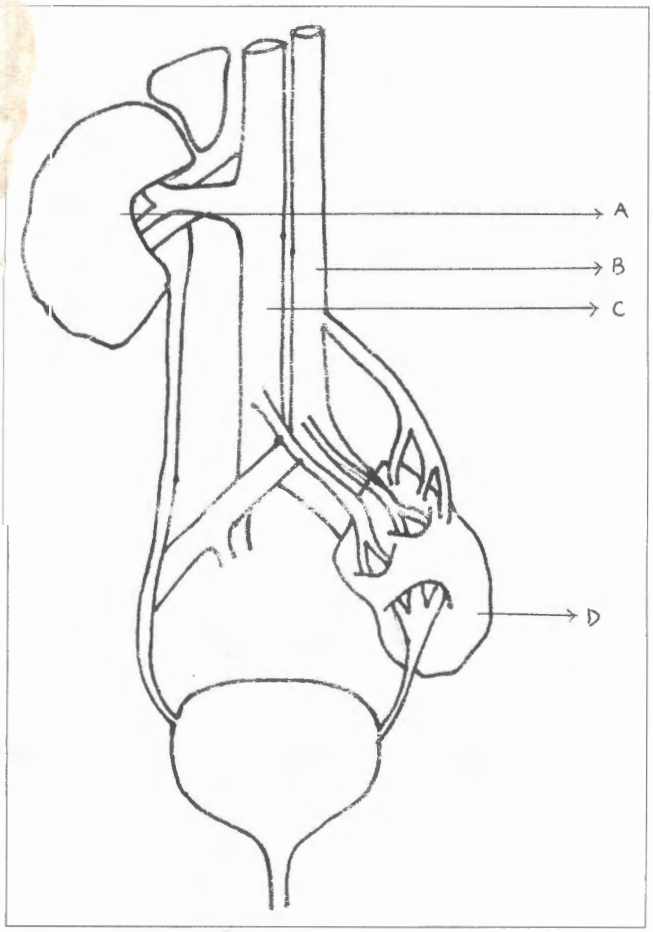

Fig. 1: Diagram showing pelvic kidney's anomalous position, vascular supply and anterior-facing pelvis
A. Normal kidney
B. Aorta
C. Inferior Vena Cava
D. Unascended Kidney

Discussion

In our series of 5 cases, all the pelvic kidneys were unilateral. While 3 of them were detected during Caesarean section, 2 were found during the course of exploratory laparotomy. 2 of the patients had genital tract anomalies in association with a pelvic kidney. While the pelvic kidney required no specific treatment in 4 patients, in one patient it was the hydronephrotic pelvic kidney, which was the source of the symptoms. In one patient, the pelvic kidney was recognized during her evaluation for infertility.

The finding of an abnormal pelvic mass, apart from the uterus and adnexae, can mislead even an experienced pelvic surgeon into a diagnosis of retroperitoneal neoplasm. One important differential diagnosis of such a mass is pelvic kidney. Prior ultrasound examination can settle the issue in most of these cases. If necessary, investigations like IVP, barium enema etc may be considered before exploratory surgery.

An ectopic kidney is one whose ascent has been arrested at some point, so that the mature kidney is not found in the renal fossa. It is most often at the pelvic brim, or within the true pelvis. Its incidence range from 1 in 500 to 1 in 1200 in autopsy series. In most cases, the opposite kidney is present, and in its normal location.

The association between renal ectopia and other anomalies, notably of the genital tract, has long been recognized. The more important anomalies are listed below:

1. Solitary ectopic kidney (contralateral renal agenesis)
2. Hydronephrotic ectopic kidney (50%)
3. Male genital tract anomalies (10-20%) of affected males)
4. Skeletal / cardiac anomalies (21%)
5. Mullerian anomalies (20-66% of affected females)
   i. Bicornuate / unicornuate uterus.
   ii. Rudimentary / absent uterus & Vagina
   iii. Duplication of vagina.

The close relation between renal ectopia and Mullerian anomalies can be explained by their embryology:

At 4 weeks the ureteric bud arises from the Wolffian duct, in close relationship to the developing Mullerian ducts. At the same time the Mullerian ducts arise by invagination of coelomic mesothelium. At 8 weeks the developing ureteric bud contacts the metanephros, induces its differentiation, migrates out of the true pelvis and rotates medially. Thus it matures into

a normal collecting system. Meanwhile partial fusion of the two Mullerian ducts gives rise to the primitive uterus and Fallopian tubes. The uterus is initially bicornuate, later becomes septate and attains normal morphology by the 5th month.

Thus any teratogenic influence or developmental aberration at this point of space and time could logically lead to the association of an ectopic kidney and a malformed genital tract.

Morphologically, the ectopic kidney is usually smaller than normal, with persistent fetal lobulations, and facing anteriorly. The ureter's length is usually less, corresponding to its proximity to the bladder. The vascular supply is anomalous, from the distal aorta or its bifurcating branches. Hydronephrosis is present in half the cases.

The ectopic kidney is distinguished from nephroptosis by its relative fixity, due to its short ureter and abnormal vascular pedicle.

While an ectopic kidney is usually asymptomatic, it may come to light:

1. During an infertility workup
2. As an abnormal pelvic mass found on examination of a symptomatic patient.
3. Due to ureteric colic of atypical distribution (often misdiagnosed as "appendicitis" or "PID")
4. On evaluaton of recurrent UTI
5. As an abnormal mass due to hydronephrosis

Thus the pelvic kidney, while usually a benign entity, can sometimes cause serious difficulties including, symptomatic hydronephrosis, urinary calculi or rarely dystocia. Possible injury during the course of labour could be prevented by early recognition and Caesarean section, if indicated. The worst complication would probably be its removal by mistake as a pelvic neoplasm. This should not happen with modern imaging techniques. Routine palpation of the renal fossae when faced with an abnormal pelvic mass would probably prevent much of this confusion.