SUPERNUMERARY KIDNEY — A CASE REPORT AND REVIEW

M M Sudhakar Krishnan
R K Jeya
P Jayalakshmi M

Department of Surgery

M M Sudhakar Krishnan, MS, FRCS (Glasg & Ed)
Associate Professor

R K Jeya, MBBS, FRCS (Ed)
Medical Officer

Department of Pathology
University Hospital
Kuala Lumpur
Malaysia

P Jayalakshmi, M Path, MRCPath
Lecturer

INTRODUCTION

Supernumerary kidney is a rare developmental anomaly and less than seventy cases have been reported (1, 2, 3). One such case which presented with a painful left sided upper abdominal mass is reported herein. Computed tomographic findings of this condition is also discussed.

CASE REPORT

A 27 year old Malay woman was hospitalised on February 12th 1982 with left loin pain, fever and rigor of five days duration. She has had similar attacks of moderately severe loin pains for the last five months. Prior to this episode she had treatment elsewhere for recurrent urinary tract infection for the past three years. Significant history consisted of thyrotoxicosis diagnosed in 1978, which was treated with antithyroid drugs for two years and since then been in remission. She had a normal full term delivery in February 1981. Physical examination revealed a normotensive lady with a pulse rate of 100 per minute and temperature of 38.4°C. A bimanually palpable, tender smooth mass of 10 × 12 cms was left in the left hypochondrium which moved with respiration. There was no clinical evidence of thyrotoxicosis. Laboratory investigations revealed mild leukocytosis and pyuria with a heavy growth of Escherichia coli.

Intravenous urography showed a soft tissue mass in the left hypochondrium. The left kidney and ureter were more lateral in position than the right, and left calyces were lower than the right. Distally the left ureter appeared to be compressed just above the bladder with no obstruction (Figure 1). There was pooling of contrast in a pouch in the pelvis, lateral to the left ureter which was thought to be a ureterococoele. Computed tomography showed a large well defined fluid filled structure anterior and superior to the left kidney with a tubular component extending distally to the bladder. A crescentic rim of contrast enhancing tissue was seen along the postero-medial aspect of the large cystic lesion (Figure 2). The left kidney appeared separate from the cystic mass (Figure 3).

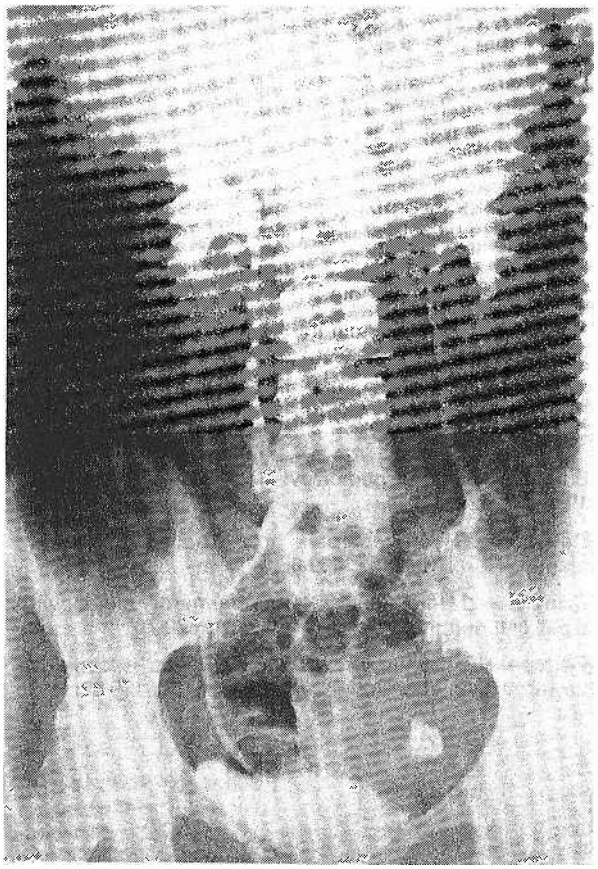

Figure 1: Intravenous urography showing a left sided soft tissue mass (supernumerary kidney) above the left kidney, and its dilated ureter in the pelvis.

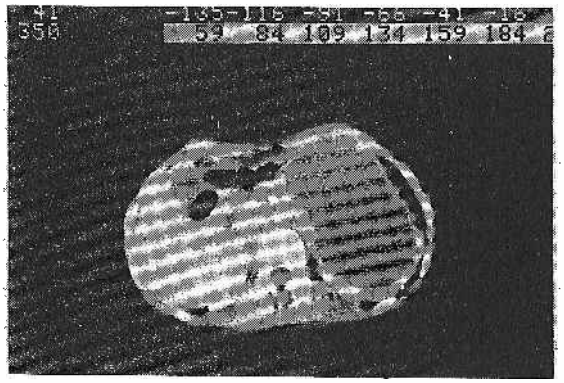

Figure 2: C.T. Scan of the abdomen showing a large well defined fluid structure with a crescentic rim of contrast enhancing tissue on its postero-medial wall.

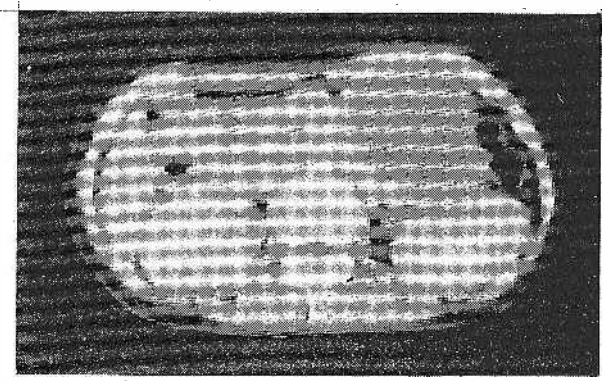

Figure 3: C.T. Scan of the abdomen showing the cystic mass separate from the left kidney.

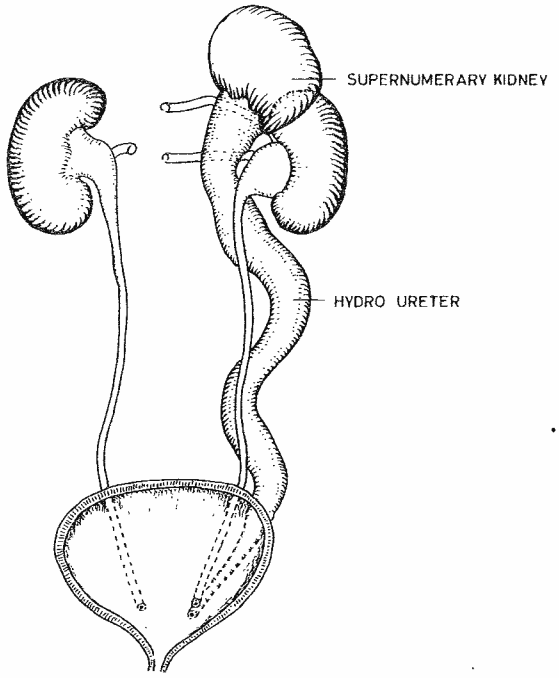

Figure 4: Diagrammatic representation of the laparotomy findings of supernumerary kidney showing its separate blood supply and dilated ureter opening separately into the bladder.

At laparotomy on 15/2/82, a supernumerary kidney in the form of a smooth thick walled cystic mass of 10 × 12 cms lying over the upper pole of left kidney was

seen. The left adrenal was in its normal position. This mass had a separate blood supply from the aorta, and connected at its lower pole was a dilated tortous ureter which opened into the bladder below and lateral to the left main ureter. The left kidney was normal in size (Figure 4). A nephrouretectomy of the left supernumerary segment was performed. This kidney had a tenous connection of loose areolar tissue with the superior pole of the left kidney. On the 2nd postoperative day she developed thyrotoxic crisis which was controlled with antithyroid drugs and propranolol. Further convalescence was uneventful and subsequent follow-up three months later revealed no abormality.

The gross specimen consisted of a partly cystic mass 10 × 12 cms attached to a hydroureter. The cut surface revealed a large cyst, one side of its wall was 1 cm thick. Histopathological examination revealed renal parenchyma with evidence of chronic pyelonephritis.

DISCUSSION

Supernumerary kidney is a third kidney, separate and in addition to the two independent kidneys. The renal parenchyma of each kidney are unconnected. The supernumerary kidney has its own ureter, independently opening into the urinary bladder and sometimes opening into the ureter of the main kidney, or rarely opening ectopically into the vagina (4, 5, 6). Whereas a duplicated kidney, which is far commoner, is an enlarged kidney with two separate and noncommunicating pelves and two ureters, the opposite kidney is also present.

Supernumerary kidney is formed due to an embryological variation, when two ureteral stalks enter into two nephrogenic entities on one side (3). Associated congenital urogenital abnormalities are not uncommon (6, 7). Supernumerary kidneys are variable in size, ranging from that of a small lymph node like structure to that of a normal sized kidney (8). Often they are small in size and functional (4). Microscopic appearance of supernumerary kidney is consistent with that of a normal kidney having a cortical and medullary layers, sometimes it may be that of a hypoplastic kidney. Supernumerary kidney has a separate blood supply from the aorta, and the veins drain separately into the vena cava. They are often located caudal to the main kidney and in one-fourth of the cases it is cephaled, but caudal to the adrenals (8). It is usually seen at the level of lumbar vertebrae and sometimes in iliac region or in front of the sacral promontory. They are equally distributed on both sides (4).

In many cases the clinical presentation is not typical of renal disease (4). Pain is often the common symptom. The illness takes a chronic course with periodical exacerbation, and during these bouts of exacerbation, the disease of the supernumerary kidney has been mistaken for appendicitis, tumours of abdominal organs and female genitalia (1, 8).

A preoperative diagnosis of supernumerary kidney is rarely made (3, 9), less than eight percent have been so diagnosed (4). The diagnosis can be made on intravenous urography or retrograde pyelogram, which shows two pelves, and kidney images separate from one another (1, 4). However, these methods may in some cases make it difficult to distinguish it from a duplicated kidney. An arteriogram would then show separate vessels supplying the three kidney shadows, not connected to each other (2, 3). Usually supernumerary kidneys present due to complications in this segment, as calculus disease, pyonephrosis as in our case, ptosis, hydronephrosis, carcinoma or following injury (10, 11). In our case the symptoms and signs were those due to obstruction and infection in the supernumerary segment, presenting as an abdominal mass with fever and rigor. An excretory urogram showed a nephrogenic shadow on the left side above the normal left kidney (Figure 1). In the pelvis the ureter of the supernumerary kidney was delineated, but could not be correctly interpreted preoperatively. Computed tomography (Figures 2 and 3) showed a large well defined mass anterior and superior, but separate from the left kidney, with a tubular component extending distally to the bladder.

Supernumerary kidney warrants treatment only when it is diseased. If there are no complaints, no treatment is required. Nephrectomy is the treatment of choice in case of disease. At operation for any other condition, if a deficiently developed supernumerary kidney is found, nephrectomy of this segment is advisable provided the patient has normal kidneys.

REFERENCES

1. Yasuhara T, Kokado Y, Hashinaka Y, et al: Free Supernumerary kidney. A case report and review of literature. J Urol 1981; 126: 231-2.
2. Sasidharan K, Babu AS, Rao MM, Bhat HS: Free Supernumerary kidney. Br J Urol 1976; 48: 388.
3. Wulfekuhler WV, Dube VE: Free Supernumerary kidney. J Urol 1971; 106: 802-4.
4. Carlson HE: Supernumerary kidney. A summary of fifty one reported cases. J Urol 1950; 64: 224-9.
5. Headings DM, Palmer RE: Supernumerary kidney with ureter opening into vagina. Am. J. Surg. 1946; 71: 370-2.
6. Fitzgerald JS: Supernumerary kidney with extravesical ureteral orifice. J Urol 1950; 63: 2; 214-7.
7. Antony J: Complete duplication of female urethra with vaginal atresia and supernumerary kidney. J Urol 1977; 118: 877-8.
8. Burgers SB: Supernumerary kidney. AMA Arch Path 1960; 69: 42-45.
9. Bacon KS: Hydronephrosis of a true supernumerary kidney. J Urol 1947; 57: 459-66.
10. Exley M and Hotchkiss WS: Supernumerary kidney with clear cell carcinoma. J Urol 1944; 51: 569-70.
11. Carlson HE: Supernumerary kidney was a cause of uretero-pelvic obstruction. J Urol 1946; 56: 179-82.