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Case Report

Bilateral Supernumerary Kidneys: Incidental Finding in a Three-Month-Old Infant

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ABSTRACT

Supernumerary kidney (SNK) is a rare congenital anomaly with fewer than 100 cases reported in the English literature. The majority of these were unilateral and only five bilateral cases have been reported. We report an infant with six kidneys, incidentally diagnosed at ultrasonographic imaging after presenting with an anterior lower chest wall abscess. Confirmation of the diagnosis was confirmed by excretory urography. To our knowledge, this is the highest number of SNK reported.

Key Words: Supernumerary kidneys, bilateral, anomaly, infant

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INTRODUCTION

Supernumerary kidney (SNK) is among the rarest congenital urological anomalies[1-3]. with fewer than 100 cases reported in the English literature[5-6]. According to Antony[7], Martius in 1656 was the first to describe a human subject with two kidneys on one side and one on the other side. The true incidence of SNK remains unknown, but most of the reported cases were in males, unilateral and on the left side[1].

There are no clinical features specific or diagnostic of SNK. The diagnosis is usually an incidental finding on imaging with excretory urography (EUG), angiography, computerized tomography or magnetic resonance (MR), or during surgery or autopsy[1-2]. To our knowledge, only five cases of bilateral SNK have been reported in the English literature.

CASE REPORT

A 3-month-old male infant was brought to the emergency paediatric unit because of one week duration of fever and anterior lower chest wall swelling that was found to be an abscess. It was surgically drained and antibiotics were prescribed. The baby had a distended abdomen since birth, and the presence of some ill-defined, ballotable abdominal masses led to the request for ultrasonic imaging.

Ultrasonography revealed hepatosplenomegaly, mild ascites and multiple kidneys. There were two normally situated kidneys in the lumbar region, which were normal in size, shape and outline. Both showed good corticomedullary differentiation and bipolar diameter of 4.6 cm. Caudal to the left kidney there were two additional kidneys. One appeared fused or poorly separated from the normal left kidney, while the other was a pelvic kidney (posterior to the urinary bladder). Another tiny kidney-like mass was also seen on its superomedial aspect (Fig. 1A, B).

EUG showed a total of six separate excretory units related to the six kidneys. Two of these kidneys were within the pelvis and

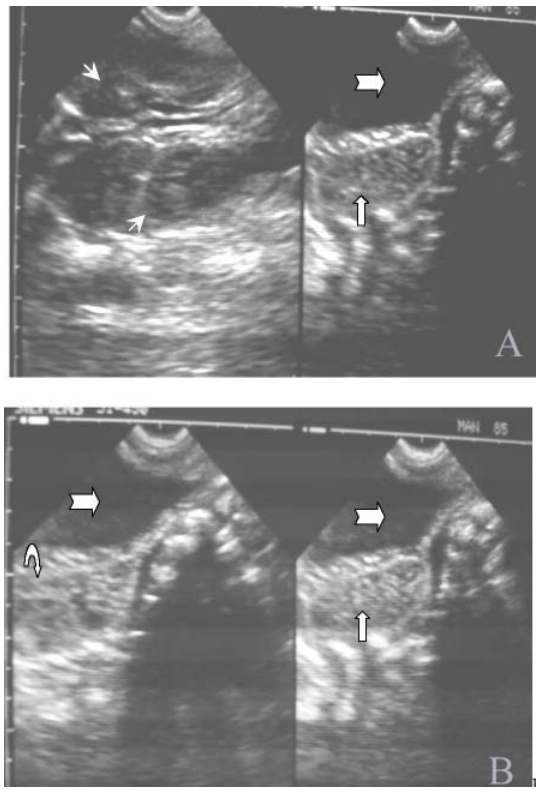

Fig. 1: Ultrasound images of a baby with supernumerary kidneys. (A) to the left is a midline longitudinal scan at the epigastrium showing both normal right and left kidneys and to the right side is a midline suprapubic longitudinal scan showing the urinary bladder (notched arrow) and a pelvic supernumerary kidney (block arrow). (B) To the right is a midline suprapubic scan showing double kidneys (curved arrow) with a crossed-fused renal ectopia appearance.

caused extrinsic indentation of the urinary bladder (Fig. 2A, B).

The parents were warned that the child may be at increased risk of renal injury in case of abdominal trauma. The infant was discharged on the 19th day of admission after complete recovery of the abscess and healing of the drain site.

DISCUSSION

The diagnosis of SNKs is made when more than two entirely separate kidneys are present[1]. The diagnosis is often incidental, or made because of complications[1-3]. The embryological anomaly results from premature division of the metanephric bud[7]. The number of kidneys probably reflects the number of abnormal divisions of the progenitor cells. Up to five separate SNKs in one individual have been identified[4]. Thus, the finding of six kidneys at EUG in this patient is unique. A SNK is usually situated caudal to the normal kidney, and rarely cranial to it[1,3-6]. The extra kidney may be of normal size, or smaller, hypoplastic and histologically unorganized[4, 7]. Most of the SNKs reported in the literature were situated in the iliac or pelvic region.

The documented pathological associations of SNK include complete urethral duplication, ureteral ectopia, hydronephrosis, calculus disease, vaginal atresia, duplication of the penis, horseshoe kidney and renal cell carcinoma[7-9]. Others are coarctation of the aorta, hypertensive encephalopathy, abdominal mass and colonic tumour[2, 6, 7].

The lack of typical symptoms or signs makes (the subject of the sentence is “lack”, i.e. singular, therefore “makes”) SNK a diagnostic and management dilemma. SNK have been diagnosed incidentally during investigation of back pain, traumatic haematuria, pyuria and hypertensive encephalopathy. However, most reported cases were incidental findings at surgery or during postmortem examination[1-3].

Incidental ultrasonic diagnosis as in this case was difficult because of the limitations imposed by overlying bowel gas and faecal matter. Only four kidneys were identified at ultrasonography in this patient, in contrast to six on EUG, which remains vital for confirming the presence and functional state of the SNK. Poor or absent function or the presence of underlying renal pathology in SNKs may sometimes require nephrectomy[4]. The ureter of a SNK may insert into the ureter of the ipsilateral kidney, directly into the bladder, or ectopically. Although all the identified SNKs in this case showed prompt and good excretion, their ureters were masked by overlying bowel loops.

Angiography can be used to define the vascular anatomy of SNKs, which tend to

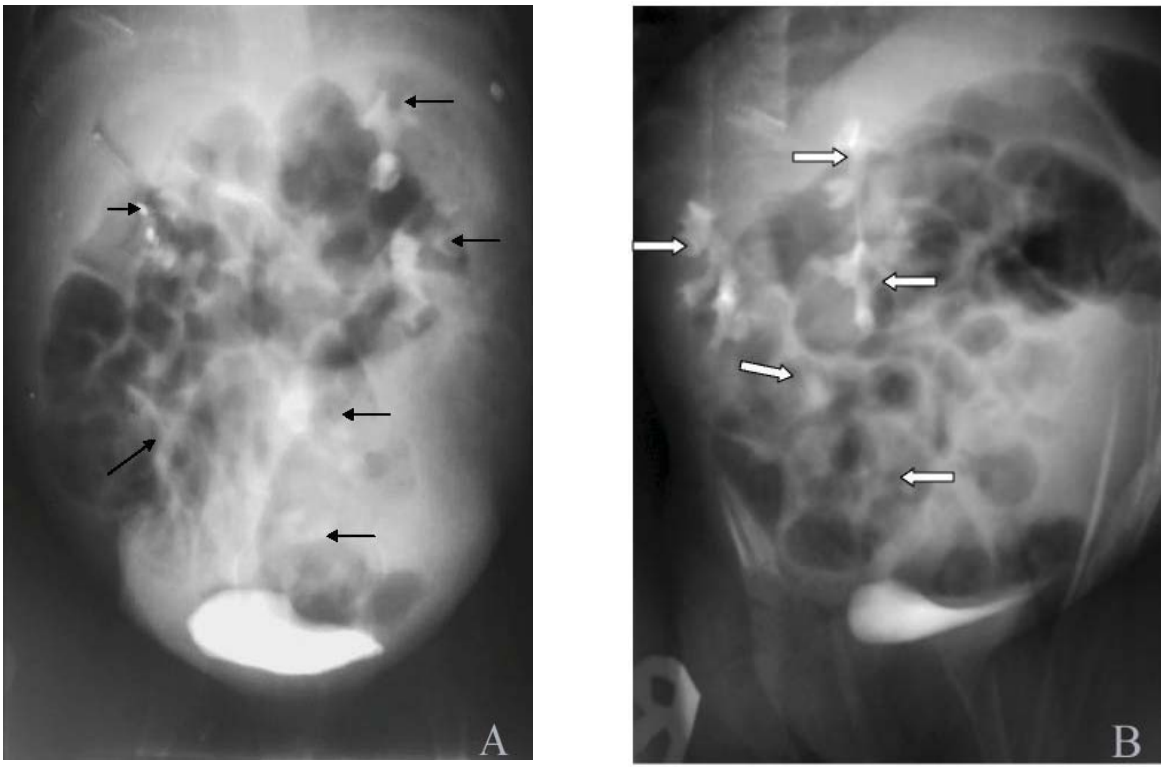

Fig. 2: Excretory urograms (A) anteroposterior and (B) oblique views showing multiple functioning supernumerary kidneys. The pelvicalyceal systems are arrowed. The concave indentation of the dome of the urinary bladder is due to the pelvic kidney.

derive their vascular supply from adjacent blood vessels[2,4]. Although there is a lack of information regarding MRI evaluation of SNK, its multiplanar capabilities and excellent soft tissue characterization should make it the optimal imaging modality for SNK.

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