

A Case Report of Right Supernumerary Kidney

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1. Introduction

Supernumerary kidney is a rare congenital anomaly. It is described as an additional kidney with its own capsule and blood supply that is not fused with the ipsilateral kidney (unlike in the more common duplex kidney). The blood supply of supernumerary kidney is highly variable and the ureters tend to join with the ureter of the ipsilateral kidney. The presence of a supernumerary kidney is often associated with increased risk of pyelonephritis, urolithiasis and hydronephrosis

The aim of this case report is to document this rare congenital anomaly

2. Case Report

A 16 year old female presented to the emergency department with complaints of abdominal pain and was evaluated for the same. Lab reports were unremarkable. There was no history of repeated urinary tract infections.

Ultrasonography done showed two kidneys on the right side with right upper kidney measuring 6.4 x 2.6 cm and right lower kidney measuring 8.1 x 3.3 cm. Right lower kidney shows mild anterior rotation. Echoes and contour are normal. No hydronephrosis. Single left kidney noted.

She was further evaluated with computed tomography with a urography phase

On the CT urogram two kidneys were noted on right side. Upper kidney appeared normal in position and orientation and measured 6.6 x 2.9 cm, which is supplied by a single branch from the aorta and venous drainage into IVC. Lower kidney measured 8.1 x 3.7 cm and appeared to be reverse rotated with hilum facing laterally. It was seen to be receiving two branches from aorta and venous drainage into IVC. Both kidneys showed normal enhancement and prompt contrast excretion. The ureter of the upper kidney is seen to be medially displaced by the lower kidney.

Ureter of the lower kidney was seen to arise laterally and coursed downwards and medially. Both the ureters on right side were seen till the level of iliac vessel, beyond which it was not opacified in delayed images.

To further evaluate the course of ureters, a correlative MR urography was done which showed probable fusion of the two right ureters at this level (level of iliac vessels) with single ureter coursing downwards into the urinary bladder. The insertion of the ureter appears to be in normal position

The patient was managed symptomatically for the abdominal pain and was advised to be on regular follow-up

3. Discussion

Supernumerary kidney is a rare entity, with fewer than 100 cases reported in literature (1,2).

The embryological basis for the occurrence of a supernumerary kidney has not been fully elucidated. One of the main theories is that there is complete duplication of the ureteral bud, with independent penetration into the metanephric blastema, which develops and divides into two kidneys. Another theory is that there are two independent ureteral buds that penetrate the metanephric blastema, which then divides. It is believed that a supernumerary kidney with a ureter that has its own insertion site in the bladder reflects an initial division of the mesenchyma before insertion and branching of the ureteral bud. A supernumerary kidney with a ureter that fuses with that of the normal kidney probably reflects late division of the metanephric mesenchyma (1).

Supernumerary kidney can range from a small lymph node like mass to a normal sized kidney, however they usually have few calyces.

They are equally distributed on both sides and supernumerary kidneys usually follows Weigert Meyer law as in most fully documented cases of double ureters

The location of the supernumerary kidneys is usually caudal to the main kidney but in 25% of cases it is cephalad, but caudal to the adrenals. It is usually seen at the level of lumbar vertebrae and sometimes in iliac region or in front of the sacral promontory.

The blood supply is highly variable, usually it is an independent branch arising from the aorta and venous drainage is into IVC (3).

4. Conclusion

Supernumerary kidneys are extremely rare and the case reported above is unique in certain aspects. One, the supernumerary kidney is located on the right side. Two, the supernumerary kidney described in this case has almost equal number of calyces as the normal kidney. Three, there is reverse rotation of the supernumerary kidney with hilum facing laterally.

References

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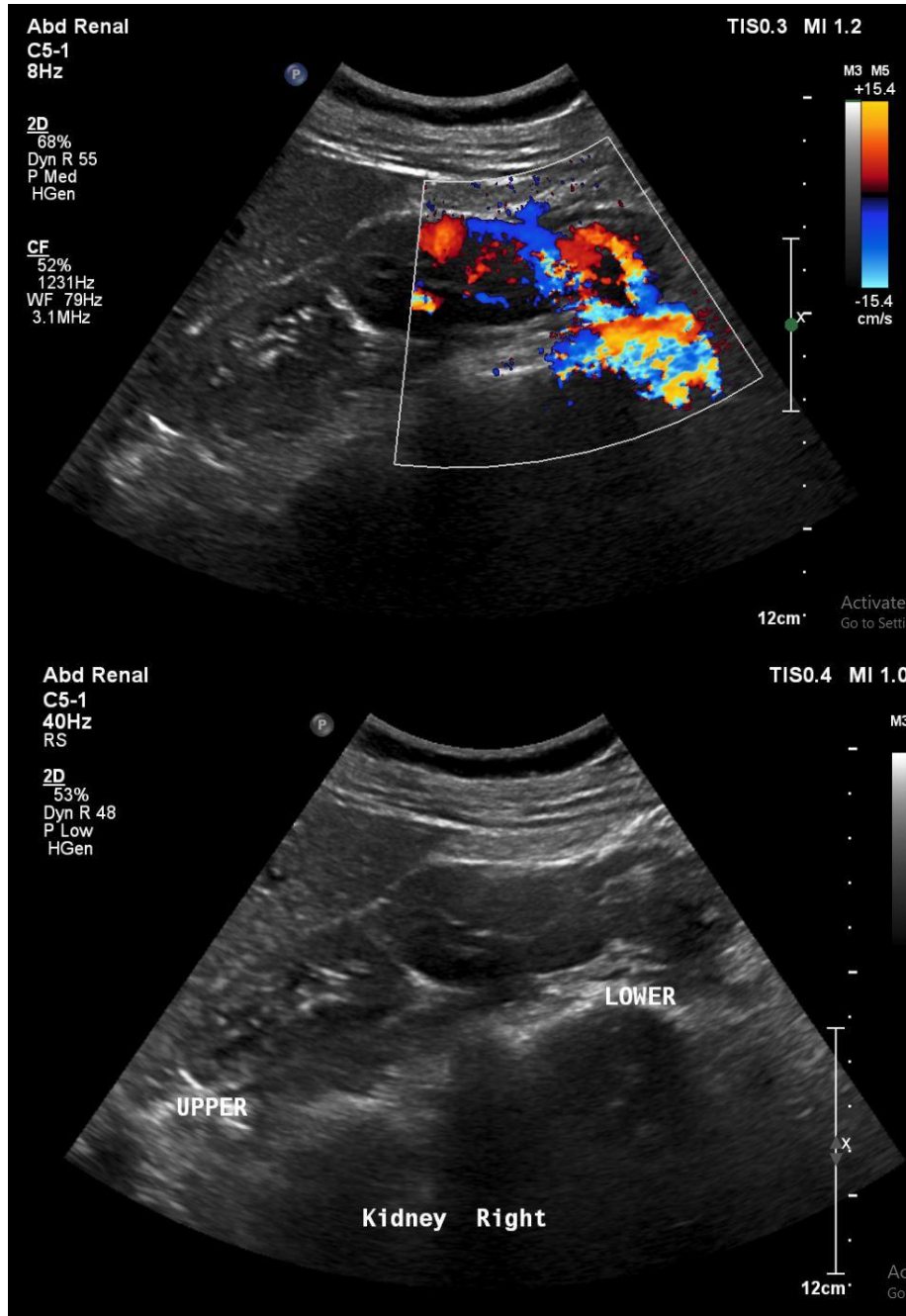


Figure 1: Ultrasonography and Colour Doppler Images of Right Supernumerary Kidney

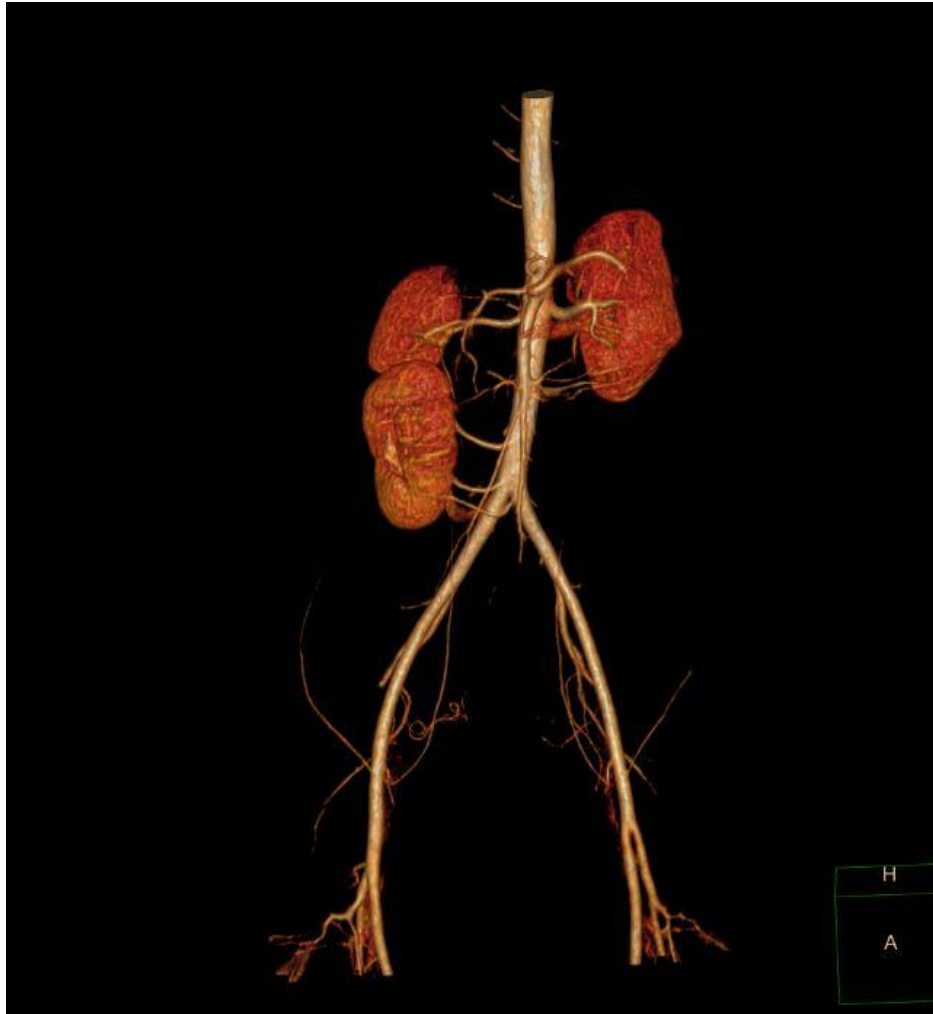


Figure 3: 3 D Reconstruction Image of Right Suprarenal Kidney with Separate Arterial Supply



Figure 2: CT Axial Images of Right Suprarenal Kidney