



## Supernumerary Kidney with Third Renal Pole and Horse Shoe Component

Supernumerary kidneys are a rare anomaly, with horseshoe kidney is the most common.<sup>1</sup> Simultaneous existence of both anomalies is extremely rare.<sup>2</sup> Supernumerary kidneys may be totally isolated from the normal kidney or connected through a loose areolar tissue and are usually smaller in size.<sup>1</sup>

Embryologically, a supernumerary kidney is believed to result from aberrant division of the nephrogenic cord into two metanephric blastemas during the 5<sup>th</sup> to 7<sup>th</sup> week of gestation that eventually form two kidneys with partial or duplicated ureteral buds.<sup>1</sup>

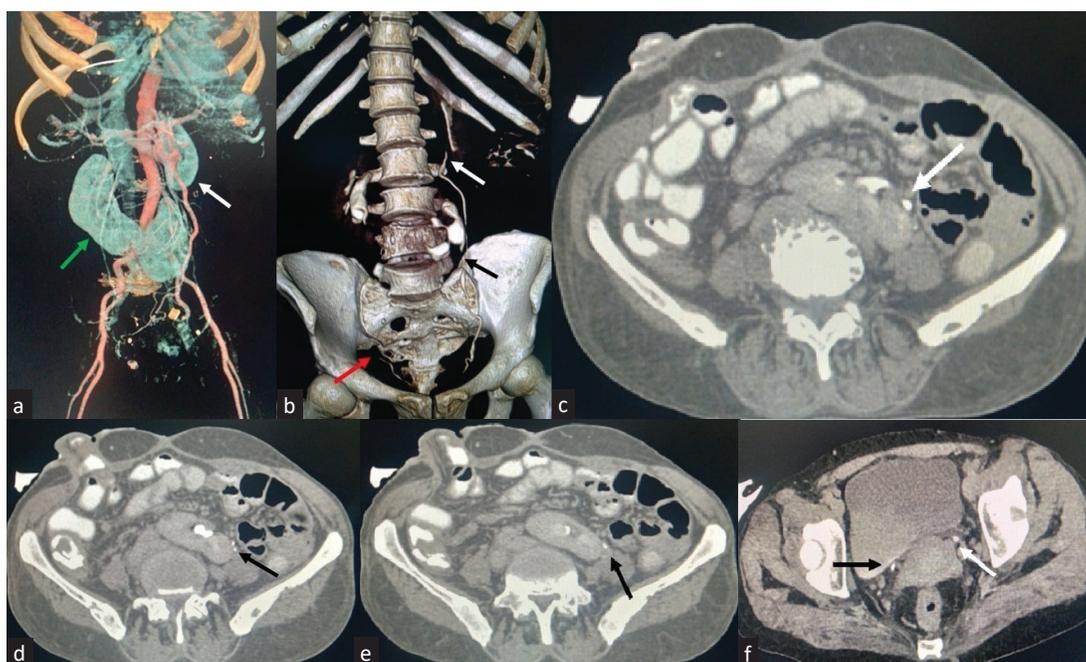
The supernumerary kidney is most often seen on the left side [Figure 1a]. It is usually located caudal to the ipsilateral kidney when drained by a bifid ureter and cranially when the ureters are separate. A cranially located supernumerary kidney drains through a separate ureter. Sometimes, the ureter may open into the vagina, resulting in urinary incontinence.<sup>3</sup> In our case, the supernumerary kidney was located cranially [Figure 1a and b] and drained through a bifid ureter [Figure 1c-e]

normally into the bladder without any ectopic opening [Figure 1f].

A supernumerary kidney usually has a separate arterial supply. Therefore, a thorough evaluation of vascular anatomy is important in patients who require surgery to prevent inadvertent damage to the supernumerary renal moiety.

The supernumerary kidney needs to be differentiated from the more commonly occurring duplex kidney, which is defined as having two pelvicalyceal systems that are associated with a single ureter or with double ureters.<sup>4</sup> A duplex kidney may not have a separate blood supply and capsule. The supernumerary kidney, in contrast, is thought to be an accessory organ with a separate arterial supply, venous drainage, collecting system, and distinct encapsulated tissue.<sup>5</sup>

Associated congenital anomalies seen in supernumerary kidneys include urethral atresia, vaginal atresia, complete duplication of urethra and penis, ectopic ureteral opening, horseshoe kidney, imperforate anus, ventricular septal defects, meningomyeloceles, and coarctation of the aorta.<sup>2,3</sup>



**Figure 1:** (a) Three renal poles are visible, left cranial (white arrow) and two of horse shoe kidney (green arrow). The left cranial supernumerary kidney has separate renal vessels. (b) The excretory urogram shows the ureter from the supernumerary kidney (white arrow) and the left moiety of the horseshoe kidney (black arrow) joining inferiorly to drain normally into the urinary bladder. The right moiety of the horseshoe kidney has its own ureter (red arrow) draining normally into the urinary bladder. (c) Two ureters are seen on left side, the anterior one is from the left renal moiety of the horseshoe kidney (white arrow). (d) Two ureters are seen on left side, the ureter from the third renal pole (black arrow) is posterior. (e) The ureters on the left have joined to form a single ureter (black arrow). (f) Both sides of the ureters (black and white arrows) are draining normally into the urinary bladder.

**Conflicts of interest:** There are no conflicts of interest.

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