

Imaging to Diagnose Duplicated Renal Collecting Systems

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What is a Duplicated Renal Collecting System:

Ureteral duplication is a common renal system abnormality that is diagnosed by radiologists. A duplicated renal collecting system is a congenital condition in which ureteric bud splits to form two separate ureters that drain from one kidney. This can be unilateral or bilateral.¹



AP VCUg IMAGE



RPO VCUg IMAGE

Voiding Cystourethrogram (VCUG):

A voiding cystourethrogram is a fluoroscopy procedure that is commonly ordered after a renal abnormality is discovered through another modality. The VCUG is used to diagnose vesicoureteral reflux or a ureterocele.² Seen on hospital acquired images to the left.⁴

Intravenous Pyelography (IVP):

Shows duplex kidneys along with other abnormalities by injecting contrast. This contrast shows the appearance and function of the renal system as it passes through the system.²



AP VCUg IMAGE



POST VOID
VCUG IMAGE

Magnetic Resonance Urography (MRU):

This modality has become more common in diagnosing renal abnormalities in children because of its ability to show the complex anatomy. The anatomical findings are the same as seen on Computed Tomography imaging.²

Computed Tomography (CT):

CT is not primarily used due to the age of the patients and the desire to reduce radiation exposure. Radiographic findings on CT often include ipsilateral ureters originating from one or both kidneys, differences in renal sizes, asymmetric dilation of the upper and/or lower poles of the collecting systems, and finally the possibility of a parenchymal cleft dividing the kidney.²

Ultrasound:

The noninvasive modality shows collecting system duplication by looking at the kidneys. Some of the findings include abnormal parenchymal contours, unequal renal lengths, and asymmetrical pelvicalyceal dilation. Typically, kidneys with duplication are larger than kidneys without duplication.^{2,3}

References:

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2. Didier, R., Chow, J., Kwatra, N., Retik, A. and Lebowitz, R. (2017). The duplicated collecting system of the urinary tract: embryology, imaging appearances and clinical considerations. *Pediatric Radiology*, 47(11), pp.1526-1538.
3. Dias, T., Sairam, S. and Kumarasiri, S. (2014). Ultrasound diagnosis of fetal renal abnormalities. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 28(3), pp.403-415.
4. Hospital Acquired Images