

IMAGING GAMUT

Reflux into the upper moiety of a duplex renal system

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Key words: Duplex renal system, reflux, paediatric, ^{99m}Tc-MAG3

Background Ultrasonographic evaluation of the renal tract in a 2-year-old boy revealed bilateral duplex renal systems, a left ureterocele and left hydronephrosis. The patient was previously diagnosed with a left hydroureter on a routine antenatal anomaly ultrasound scan.

Procedure The patient was referred to the nuclear medicine department for scintigraphic evaluation of renal function and excretion at the age of 1 and 6 months. Dynamic renal scintigraphy was performed after intravenous injection of ^{99m}Tc-mercapto acetyltriglycine (^{99m}Tc-MAG3).

Findings The study at the age of 1-month showed the right kidney functioning as a single unit and draining normally and a left kidney with a poorly functioning upper moiety and a well functioning lower moiety. The left ureterocele was excised and a subsequent ^{99m}Tc-MAG3 scan at 6 months performed (Figure 1). This confirmed the non-functioning

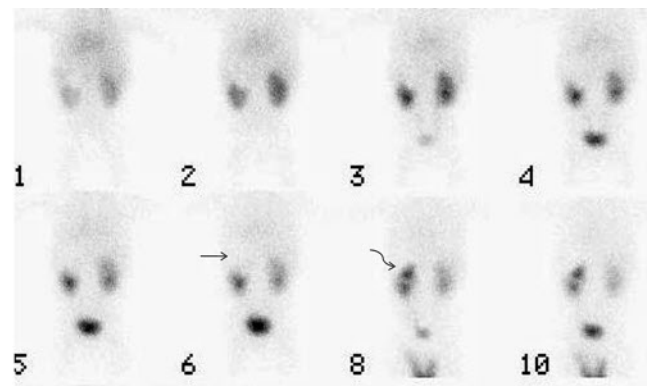


Figure 1 Summed images (1-10 minutes) generated from the dynamic scan showing a photopenic region at the upper pole of the right kidney (straight arrow) on the 6-minute image, with increased activity seen in this region at 8 minutes (curved arrow) when the patient voided (decrease in bladder activity and activity in the nappy)

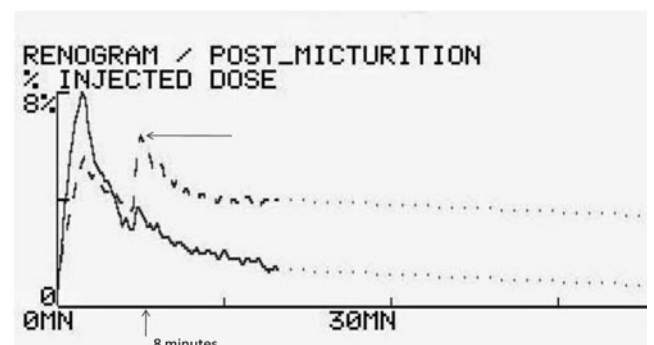


Figure 2 At 8 minutes there is a sudden increase in counts in the right renogram curve (horizontal arrow)

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left upper moiety, with a well functioning lower moiety. Eight minutes from the start of the study, the baby voided almost completely into the nappy with a sudden appearance of activity in the region of the upper moiety. The renogram correspondingly showed a secondary peak at 8 minutes.

Conclusion The sudden appearance of tracer in the upper moiety and the concurrent increase in counts in the renogram curve at 8 minutes corresponded with the bladder emptying (Figure 2). These findings were compatible with vesico-ureteric reflux.

Comments Within a duplex renal collecting system, the upper moiety tends to get obstructed whereas reflux typically occurs into the lower moiety drained by a ureter with a laterally ectopic ureteral orifice and a shortened submucosal tunnel. Reflux into the upper moiety of a duplex system is rare; however, if the ureterocoele has been punctured, the finding of upper moiety reflux is much more common. It is important not to ascribe the sudden appearance of activity in the upper moiety to a functioning moiety as this will change the patient's management [1]. The patient subsequently underwent left upper pole heminephroureterectomy, which is the treatment of choice and results in satisfactory outcome in paediatric patients [2].

References

1. Singh RR, Wagner S, Chandran H. Laparoscopic management and outcomes in non-functioning moieties of duplex kidneys in children. *J Pediatr Urol* 2010; 6(1):66-69.
2. Jayrama G, Roberts J, Hernandez A, Heloury Y, Manoharan, Godbole S, LeClair M, Mushtaq I, Gundeti MS. Outcomes and fate of the remnant moiety following laparoscopic heminephrectomy for duplex kidney: A multicenter review. *J Pediatr Urol* 2011;7(3):272-275.