

IMAGING GAMUT

Scintigraphic presentation of the "cobra head sign" in ureterocoele

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Key words: Ureterocoele, Cobra head sign, Tc-99m MAG3 scintigraphy

Background A 5-year-old boy with a history of difficulty in micturition since the past three years. His laboratory investigations were within normal limits. Ultrasound examination showed a small and shrunken right kidney and bilateral hydronephrotic but there was no evidence of a congenital structural abnormality seen. The patient was referred to the nuclear medicine department for dynamic renal scintigraphy for further investigation.

Procedure The scan was performed 15 minutes after intravenous administration of 10 mg Frusemide. A bolus injection of ^{99m}Tc -MAG3 was administered into the ante-cubital vein and dynamic imaging was performed in the standard posterior projection for 30 minutes with a Gamma Camera fitted with a low-energy general-purpose collimator.

Findings ^{99m}Tc -MAG3 dynamic renal scan (Figure 1) showed a non-functioning right kidney and a well functioning but hydronephrotic left kidney with a hydronephrotic and associated sacular outpouching at its distal end consistent with ureterocoele. There was early filling of the bulbous terminal ureter with surrounding halo of the empty urinary

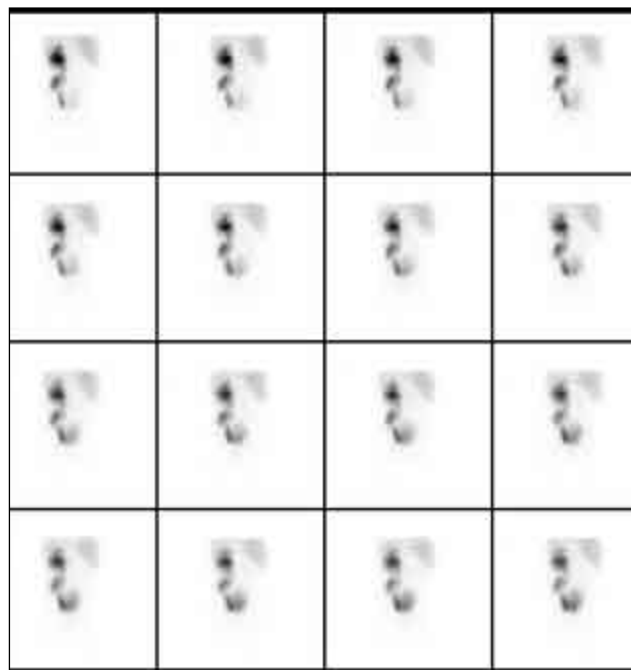


Figure 1 Posterior view sequential dynamic images of the ^{99m}Tc -MAG3 renal scan showing a hydronephrotic but fairly well functioning left kidney with a hydronephrotic and sacular outpouching at its distal end consistent with ureterocoele. There is early filling of the bulbous terminal ureter with a surrounding halo by the empty urinary bladder. The right kidney appears non-functional

Bladder analogous to cobra head sign of ureterocoele seen on intravenous urography (Figure 2).

Conclusion The scan appearances were consistent with a non-functioning right kidney

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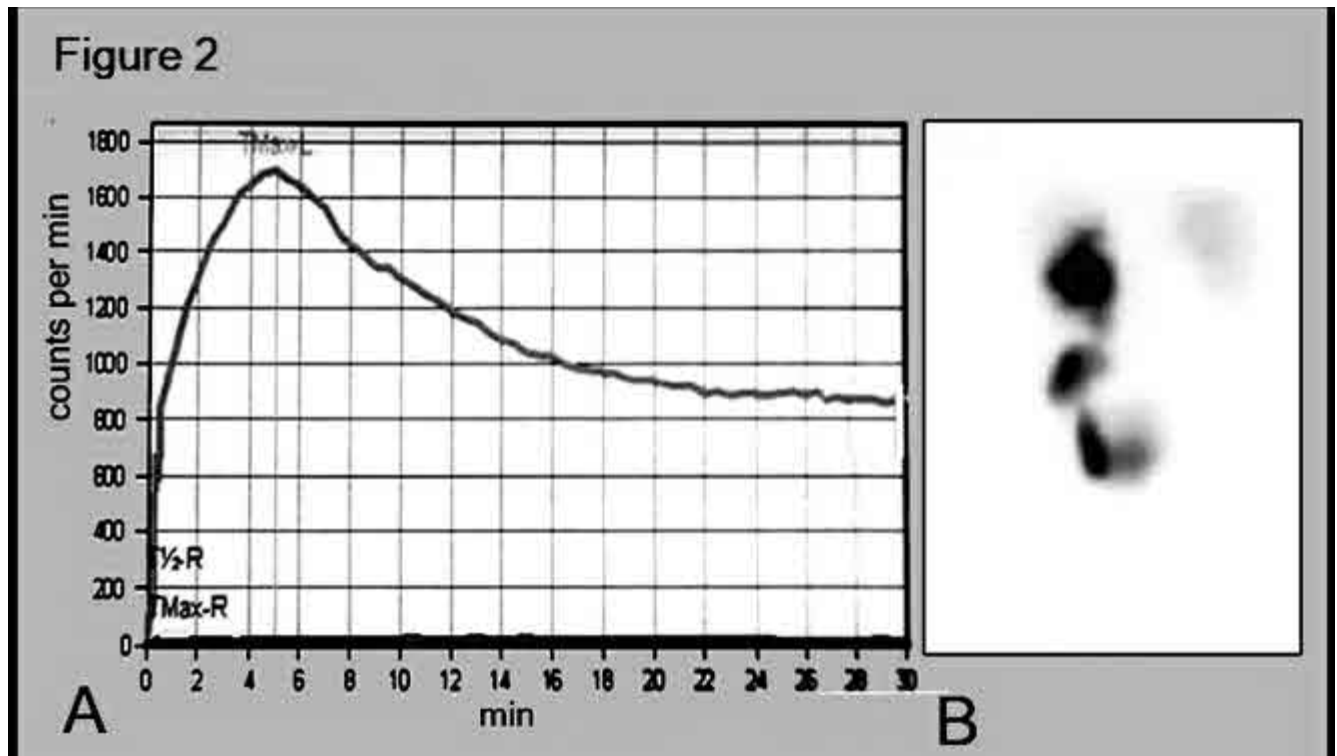


Figure 2 (A) The left renogram showing a good upslope, functional peak followed by gradual downslope with a flat or non-functional curve seen on the right; (B) composite image demonstrating "cobra head sign"

and fairly well functioning left kidney. Early filling and specific appearance of distal ureter on the left seen on the MAG3 scan were highly suggestive of ureteroceles as the appearances closely mimicked the known radiologic and the reported scintigraphic appearance of the "cobra head sign" in ureteroceles.

Comments Ureteroceles are a congenital urinary abnormality characterized by the presence of an intrabulbar hernia or cystic ballooning of the lower end of a ureter lying between the mucosa and muscle of the bladder. Pathologic ureteroceles most often affect the paediatric population [1].

This condition may remain unrecognized until adult life. Ureteroceles are usually discovered on radiological examination or during endoscopy [2]. Renal and bladder sonography is the first-line imaging study. A ureterocoele is seen as a fluid-filled cystic intravesical mass. It is also known as a "cyst within a cyst" [3]. On IVP, the appearance of a

ureterocoele as it protrudes into a contrast filled bladder has been referred to as the "cobra head" sign, which is characterized by bulbous dilatation of the distal end of the ureter with a surrounding radiolucent halo [4]. Similar appearances have been reported on scintigraphy [5].

^{99m}Tc-MAG3 renal scintigraphy is primarily a functional imaging tool for the assessment of quantitative differential renal function, investigation of obstructive uropathy and nephropathy and other renal outflow disorders such as reflux nephropathy and bladder dysfunction. The study can however occasionally provide additional information on anatomical structural deformities of the kidneys, ureters and the bladder as exemplified in the present case where there was a significant deviation from the normal scan appearances because of the anatomical and physiological changes associated with ureterocoeles.

References

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