

# Unilateral renal agenesis revealed by hydronephrosis of contralateral kidney and explored by $^{99m}\text{Tc}$ -DMSA and $^{99m}\text{Tc}$ -DTPA scintigraphy

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## Abstract

Renal scintigraphy is a physio-functional exploration permitting the exploration and assertion of unilateral renal agenesis. We report the case of a patient followed for a right hydronephrosis having revealed an agenesis of the contralateral kidney confirmed by  $^{99m}\text{Tc}$ -DMSA scintigraphy. Also  $^{99m}\text{Tc}$ -DTPA scintigraphy allowed the evaluation of the permeability of the urinary tract of the single right kidney by confirming the presence of an organic obstruction. This contributed to a surgical treatment of the obstruction and the re-establishment of the permeability of the right urinary tract. This case suggests that renal scintigraphy is useful to confirm the authenticity of renal agenesis by eliminating the possibility of renal hypoplasia and also to evaluate the functional potential and the permeability of contralateral and single unique tract considered like very precious.

## INTRODUCTION

Unilateral renal agenesis is the absence of one of the kidneys. It corresponds to absence of development of the ureteral bud towards 4th or 5th week. This anomaly is relatively rare, because much of "empty lumbar pits" comparable to agenesis, correspond in fact to the presence of small hypoplastic and/or dysplastic kidney escaping from the conventional means of diagnosis. The goal of this work is to determine the benefit of scintigraphy in the affirmation of diagnosis, by eliminating any dysplasia and any ectopic localization sometimes inaccessible to the other means of morphological imagery.

## CASE REPORT

A 16 years old girl without particular antecedent consulted for right lumbar pain evolving in afebrile context. The clinical examination objectified a supple abdomen without palpable mass, free lumbar pits and normal external genital organs.

Abdominal radiography was without particularity.

Echography showed pelvic and calix dilatation of the right kidney and doesn't visualise the left kidney. Renal function was proven normal with sterile urine.

Intravenous urography revealed the absence of secretion and excretion in the left side until the 16<sup>th</sup> hour after injection of

contrast product with a right ureteropelvic junction syndrome (figure 1).

**Figure 1**

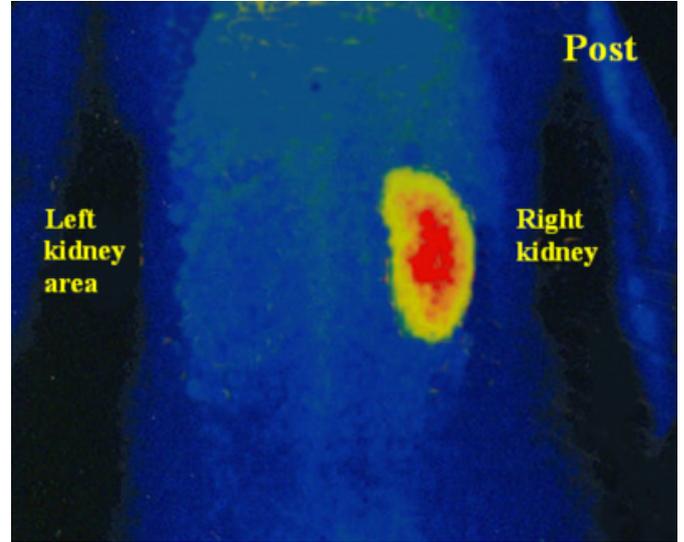
Figure 1: Intravenous urography revealed the absence of secretion and excretion in the left side until the 16 hour after injection of contrast product with a right ureteropelvic junction syndrome.



Tc <sup>99m</sup> -DMSA renal scintigraphy showed the absence of uptake of tracer compared to the left renal area confirming the diagnosis of right renal agenesis (figure 2).

**Figure 2**

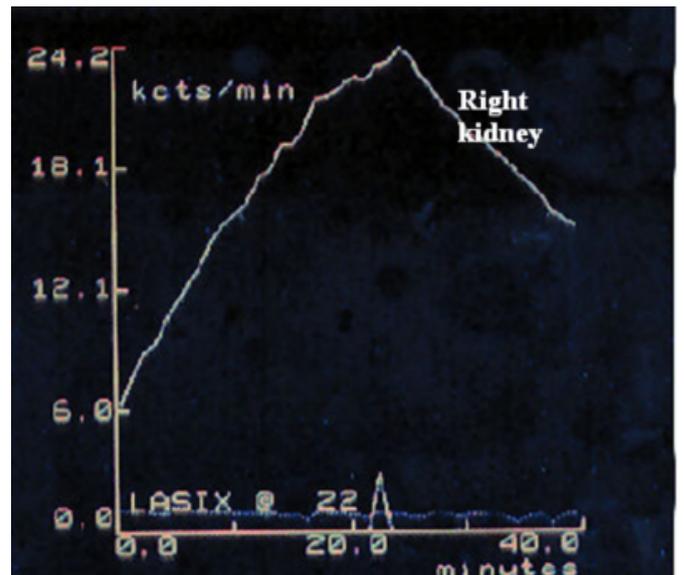
Figure 2: Tc -DMSA renal scintigraphy in posterior incidence showed the absence of uptake of tracer compared to the left renal area confirming the diagnosis of left renal agenesis.



Tc <sup>99m</sup> -DTPA renal scintigraphy revealed a delay of excretion in the right isotopic nephrogram with a negative furosemid test attesting the organic character of obstruction without caption of tracer in the left side (figure 3).

**Figure 3**

Figure 3: Tc -DTPA renal scintigraphy revealed a delay of excretion in the right isotopic nephrogram with a negative furosemid test attesting the organic character of obstruction without capitation of tracer in the left side



A fast surgical pyeloplasty was carried out for safeguard the functional potential of the right single kidney. The evolution

was marked by a good clinical improvement with disappearance of pain and regression of dilation in echography and control scintigraphy.

## DISCUSSION

Unilateral renal agenesis is regarded as little frequent (1 case per 1000 births), but this figure does not represent the exact incidence of this malformation whose diagnosis depends on the techniques implemented <sub>1</sub>. Indeed, the majority of renal agenesis are actually severe hypoplasias, whose very low size does not allow detection by the most usual techniques of imagery (echography, intravenous urography, computed tomography) <sub>2</sub>.

Unilateral renal agenesis may be asymptomatic and is often incidentally diagnosed by abdominal ultrasound or computed tomography (CT) scan secondary to another condition. In infants with unilateral renal agenesis, the remaining kidney may be the revealing factor of associated anomaly as is the case for our patient insofar as left renal agenesis was revealed by a right ureteropelvic junction syndrome. In fact, the association with many other malformations, in particular of the urogenital sphere is traditional; they are observed in nearly 20 % of the cases on the side of agenesis and in 0.5% on the contralateral side as is the case in our patient [3].

Renal scintigraphy as physio-functional exploration intervenes to affirm or cancel with certainty the diagnosis of a renal agenesis, thanks to the use of tracers with tropism of fixing and/or renal collecting (Tc <sup>99m</sup> -DMSA, Tc <sup>99m</sup> -DTPA), with a sensitivity estimated at 99% and one specificity exceeding the 98,8% [4]. In our patient, the Tc <sup>99m</sup> -DMSA scintigraphy could confirm the diagnosis evoked with the Intravenous urography by eliminating any hypoplasia and any ectopic renal localization.

Tc99m-DTPA made it possible to determine the organic character of the obstruction of the unique right kidney, its

importance (element determining for the therapeutic choice), and also its functional value.

Such an association would impose a fast therapeutic sanction of malformation occurring on a single kidney, while insisting on a monitoring of almost its functional value. From where interest of the renal scintigraphy which should be carried out once every 6 months in complement with the data of the other means of medical imagery. Moreover, the noninvasive character of this technique of imagery and the using of nonwounding products for the kidney, contrary to the products of radiological contrast, are invaluable advantages among particularly fragile patients.

## CONCLUSION

Unilateral renal agenesis indicates a viable malformative anomaly which suggests a narrow elementary monitoring of the single contralateral kidney, particularly when this last fact is the object of an added anomaly. The limits of the traditional techniques for the diagnosis of renal agenesis confers to the scintigraphy the privilege to affirm the authenticity of this malformation, while allowing a assessment of functional value of the single contralateral kidney.

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