

# Contribution of $^{99m}\text{Tc}$ -DTPA scintigraphy with diuretic test in the exploration of acute urinary obstruction in a transplant patient

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## Abstract

Urinary tract obstruction is a threat for graft function. Routine ultrasound can be important for early detection of problems in the postoperative period, but its findings can be at the origin of false-negative in the mild dilatation of calyces and renal pelvis. In the current case,  $^{99m}\text{Tc}$ -DTPA dynamic renal scintigraphy with diuretic test, as a functional modality, was very helpful in early diagnosis of organic obstruction. It allowed moreover directing the therapy while evaluating its effectiveness a few weeks afterwards.

## INTRODUCTION

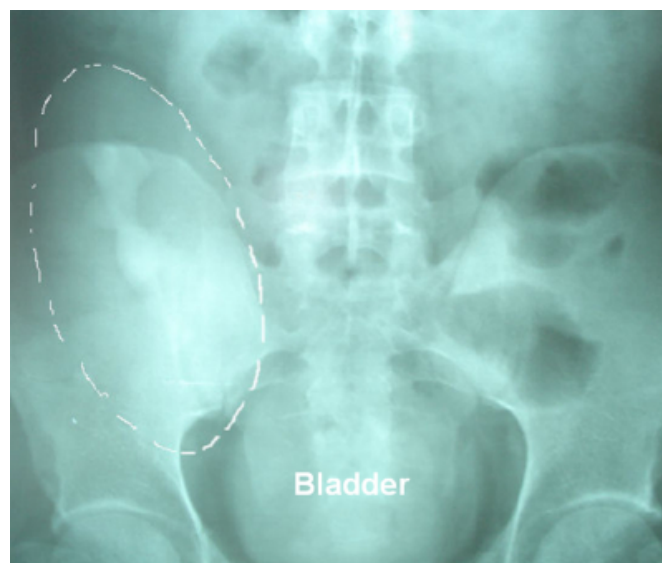
Renal transplantation is the best available treatment for most patients with end stage renal disease. However, serious surgical complications can occur after renal transplantation like urinary obstruction. Its early diagnosis should be performed to prevent permanent damage to the kidney. The current case presents the value of diuretic DTPA- $^{99m}\text{Tc}$  renal scintigraphy in the detection of acute urinary obstruction in renal transplantation.

## CASE REPORT

26 years old man patient followed for a chronic renal failure at a final stage having profited from a renal transplantation starting from an alive donor. The immediate operational continuations were satisfactory. In fact, on the postoperative first day, urinary output was 3100 ml and blood creatinine level 13 mg/l. The evolution was marked 4 weeks after the transplantation by a moderate diuresis reduction while creatinine was slightly increased to 19 mg/l. Renal ultrasonography was carried out and showed no important abnormality. There was a light dilatation of calixiel groups and pelvic distension with a preserved cortical index. Intravenous urography revealed a dysrotation of the right renal graft and confirmed the light pelvic and calix distension (figure 1).

## Figure 1

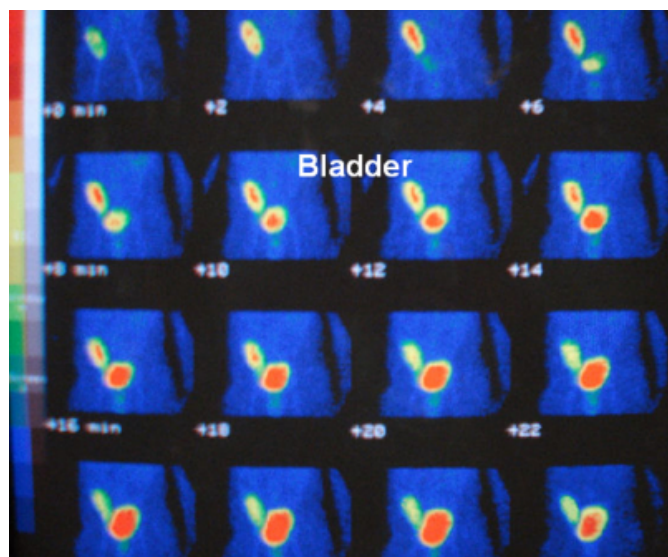
Figure 1: Intravenous urography revealed a dysrotation of the right renal graft with a light pelvic dilatation.



$^{99m}\text{Tc}$ -DTPA dynamic renal scintigraphy demonstrated a normal perfusion index to the graft. Early images of the study showed good tracer uptake with a delay of excretion in the graft isotopic nephrogram (figure 2).

**Figure 2**

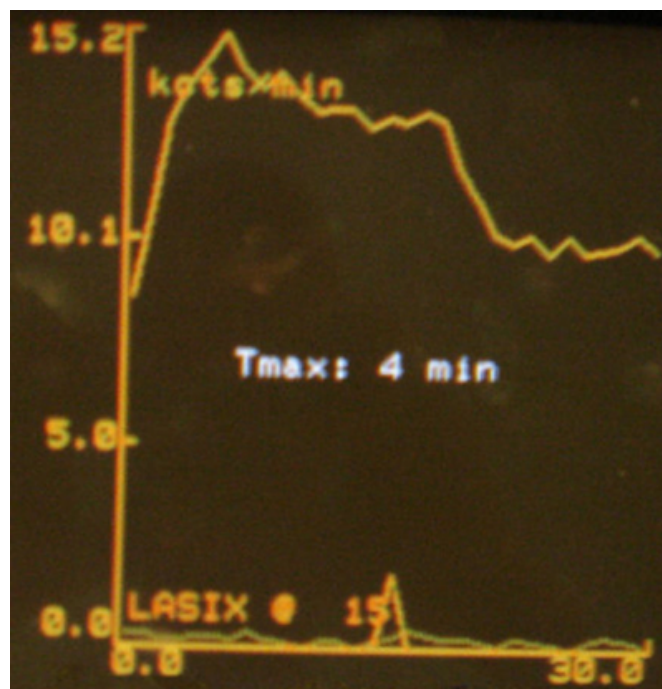
Figure 2:  $\text{Tc}$ -DTPA renal scintigraphy with dynamic acquisition of sequential images showed an increase in the time of collecting of the tracer and a delay of excretion.



A diuretic test using furosemid according F+15 was negative attesting the organic character of obstruction (figure 3). The drawing of the region of interest in front of the uretero-vesical junction showed that obstruction was located at this level. A surgical repair of the obstruction was carried out and an ureterovesicocutanoues stent was inserted. Postoperative diuresis was remarkably improved and blood creatinine level returned normal.

**Figure 3**

Figure 3:  $\text{Tc}$ -DTPA renal scintigraphy revealed a delay of excretion in the right graft isotopic nephrogram with a negative furosemid test attesting the organic character of obstruction.



## DISCUSSION

Kidney transplants have become common surgical procedures. The surgical techniques for transplant are well established and the procedure is associated with high success rates. Nonetheless, the detection, accurate diagnosis, and timely management of surgical complications occurring after kidney transplant are important tasks of the team managing these patients. A delay in the diagnosis or management of these complications can result in significant morbidity to the recipient, with risk of graft loss and mortality.

In acute renal obstruction, reduced urinary output and elevated blood creatinine levels are known to be non-specific findings which may also be noted in other non-obstructive graft dysfunction<sup>1</sup>. Conventional ultrasonography (US) studies may detect mild pelvicalix dilatation such the case at our patient, or no abnormality. Recently renal doppler US is documented to be promising tool since this modality reflects associated renovascular resistance alterations and restrictive index (RI) change in the obstruction of native and transplanted kidneys<sup>2,3</sup>. However these variations are less clear when the obstruction is at a beginning stage. Intravenous urography can be requested to direct the diagnosis when the blood creatinine level is moderately high

as at our patient.

Since  $^{99m}\text{Tc}$ -DTPA exposes the patient to considerably less radiation and the images are of superior quality, it has gained wide acceptance in clinical practice. The shape of the renogram curve, response to diuretic injection is commonly used to evaluate permeability of urinary tracts <sup>4, 5</sup>.

At the moment when ultrasonography can yield an anatomical record of renal allograft,  $^{99m}\text{Tc}$ -DTPA dynamic renal scintigraphy with diuretic test, as a functional modality, seems to be very helpful in early diagnosis of organic obstruction. It allows moreover directing the therapy while evaluating its effectiveness a few weeks afterwards.

## **CONCLUSION**

Urinary obstruction is a threat for graft function. Routine ultrasound can be used for detection of problems in the postoperative period, but its findings can be at the origin of

false-negative in the mild dilatation of calyces and renal pelvis.  $^{99m}\text{Tc}$ -DTPA dynamic renal scintigraphy with diuretic test is helpful in early diagnosis and treatment of organic obstruction.

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