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CLINICAL VALUE OF DIURETIC RENAL SCINTIGRAPHY IN A TRANSPLANT PATIENT WITH ACUTE URINARY OBSTRUCTION

AKUT ÜRÎNER OBSTRÜKSİYONU OLAN RENAL TRANSPLANTASYONU! BİR HASTADA DİÜRETİK BÖBREK SİNTİGRAFİSİNİN KLİNİK DEĞERİ

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ÖZET

Renal transplantasyon sonrası üriner obstruksiyon %3-10 oranında görülmektedir. Akut üriner obstruksiyonun erken tanısı uzun süreli greff hasarının önlenmesi açısından önemlidir. Bu olguda erken tanıda renal diüretik sintigrafmin klinik tanıya olan katkısı klinik ve ultrasonografık bulgularla karşılaştırmalı tartışılmıştır.

Anahtar sözcükler: Böbrek transplantasyonu, diüretik renografi, üreterik obstruksiyon, doppler ultrasonografi

SUMMARY

Urinary tract obstruction occurs with a 3-10 % incidence following renal transplantation. Early prompt diagnosis of acute urinary obstruction is essential in order to prevent long-term graft damage. In the current case, the diagnostic value of diuretic renal scintigraphy is presented in comparison with clinical and ultrasonographic findings.

Key words: Renal transplantation, diuretic renography, ureteric obstruction, doppler ultrasonography

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 that threaten graft survival. As urinary obstruction is an important post-surgical complication, early investigation of urinary obstruction should be performed in order to prevent permanent damage to the kidney. Unfortunately, reduced urinary out put and elevated blood creatinin levels are known to be nonspecific findings of urinary obstruction which may also be noted in other non-obstructive graft dysfunction (1).

Hydronephrosis occurring after renal transplantation can easily be diagnosed by using US, CT or MR. However, in acute renal obstruction before the development of dilation in collecting system, ultrasound findings may be false-negative. In the recent years, renal doppler indices have reported to be reliable parameters in the diagnosis of acute renal obstruction (2,3). The current case presents the value of diuretic Tc99m MAG-3 renal scintigraphy in the detection of acute urinary obstruction in renal transplantation in comparison with clinical and ultrasonographic findings.

CASE REPORT

A 22 year-old women with a history of chronic renal failure and a living related transplant presented with anuria on the postoperative second day whose transplantation was performed without any complication. Her blood creatinine level at the time of initial transplantation was 8.7mg/dl. On the postoperative first day, urinary output was 4900 ml and creatinin level was 1.8 mg/dl . The next day the volume of the urine was decreased while creatinin was increased to 2.8 mg/dl. No change in urinary output was noted after the withdrawn of the Double-J stent. Renal doppler study was performed in order to assess the graft function which showed no gross abnormality. There was slight calixiel dilation and pelvic distention with resistance indexes 0.57-0.60 **(Figure 1).**

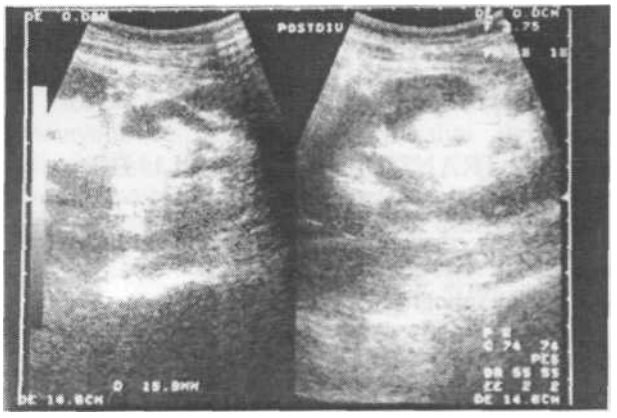

Figure 1: Renal doppler study shows minimal calixiel dilation and pelvic distention

Tc99m MAG3 dynamic renal scintigraphy demonstrated well-defined flow peak to the graft with normal perfusion index. Early images of the study showed good tracer uptake with a prolongation of the activity in the collecting system with slow clearance **(Figure 2)** . Diuretic was induced according to F+20 protocol and renogram parameters were assessed. Renogram analysis showed rising renal curve with $t_{ln} >$ 20 min with no response to diuretic. The ureter was also faintly visualized. Therefore, these findings were accepted as suggestive findings of upper urinary tract obstruction **(Figure 3)** . Since the urinary output and other laboratory findings showed progressive decline in renal function, the patient was promptly operated. A large coagulum was noted obliterating the along the ureter. After removing of the coagulum ureterovesicocutanoues stent was inserted. Postoperative urinary output increased and blood creatinine level were returned normal (0.92).

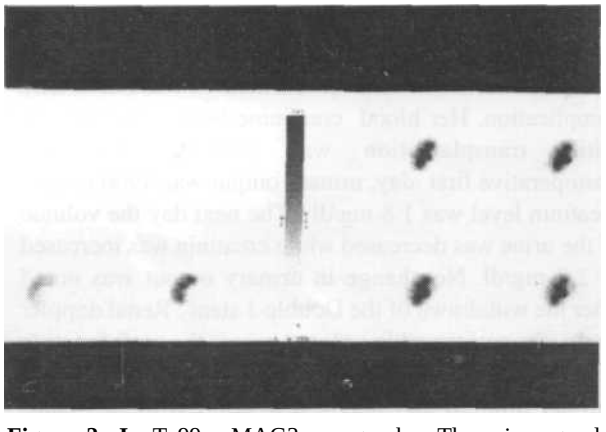

Figure 2: In Tc99m MAG3 renography. There is a good parencymal uptake. After diuretic infection, delayed 30th min. image demonstrates marked retention of radiopharmaceutical in the collecting system.

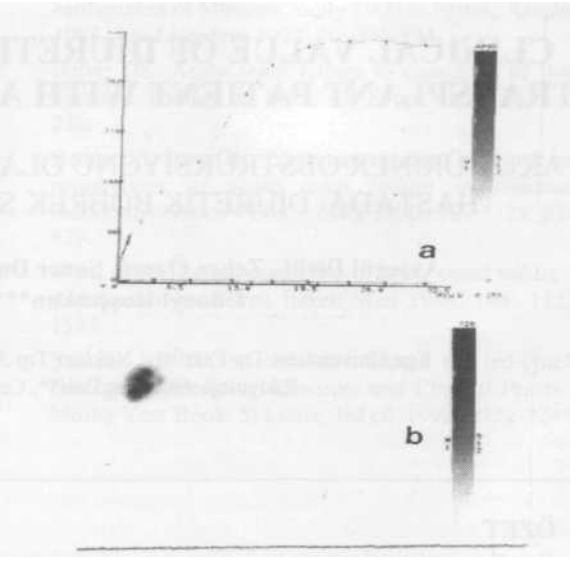

Figure 3a: Renogram analysis demonstrates rising renal curve and no response to diuretic.

Figure 3b: In 40th min. delayed image, there is still marked retention of radiopharmaceutical in the collecting system, consistent with upper urinary tract system.

DISCUSSION

There are several encountered causes of posttransplantation obstruction. Immediately after transplantation, edema at the ureteric implantation site can result in temporary mild obstruction. The edema usually subsides promptly without the need for any intervention. Peripheral fluid collections such as lymphoceles, abscesses, hematomas, may impair ureteral drainage because of the mass effect. Ureteric blood clots, calculi and strictures are the intrinsic causes of ureteral obstruction (4,5).

US is a well-established as a screening tool for renal obstruction as well as in the native kidneys. Dilated collecting system can easily be diagnosed with ultrasonographic examination. However, its usefulness in acute renal obstruction is limited since the evaluation of this structural change requires time. Conventional US studies may detect mild pelvicaliectasis or no abnormality in acute renal obstruction. Recently renal doppler US is documented to be promising tool since this modality reflects associated renovascular resistance alterations and RI change in the obstruction of native and transplanted kidneys. A significant elevation in RI in the early obstructive period, even before dilatation developed and the RI remained high until the obstruction was relieved (6,7).

Since Tc99 MAG3 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 and quantitative clearance parameters are commonly used in the evaluation of urinary obstruction. However standard diuretic renography has known to have false-negative rate particularly when graft function is poor (8,9).

Ultrasound can yield an anatomical record of renal allograft. The addition Doppler technology has permitted screening for hemodynamic alterations. As in the presented case; while ultrasonography was inconclusive in the detection of acute renal obstruction, a functional modality, Tc99 MAG3 dynamic renal scintigraphy seems to be helpful in early diagnosis and guiding the therapy.

REFERENCES

1. Shoskos DA, Hanbury D, Cranston D, Morris PJ: Urological complications in 1000 consecutive renal transplant recipients. The Journal of Urology. 1995;153:18-21.
2. Letourneau JG, Day DL, Ascher NL, Castaneda-Zuniga WR: Imaging of renal transplants. AJR 1988; 150:833-838.
3. Miletic D, Fuckar Z, Sustic A , et alResistance and pulsatility indices in acute renal obstruction. Journal of Clinical Ultrasound 1998;26:79-84.
4. Keller H, Noldge G, Wilms H, Kriste G: Incidence, diagnosis and treatment of ureteric stenosis in 1298 renal transplant patients. Transpl Int 1994;74:922-925.
5. Dubousky EV, Russell CD, Erbaş B: Radionuclide evaluation of renal transplants. Semin Nucl Med 1995;25:49-59.
6. Platt JF, Ellis JH, Rubin JM: Renal transplant pyelocaliectasis: role of duplex doppler US in evaluation: Radiology 1991; 179:425-428.
7. Veltri A, Seratlonga M, Santoro B, et al: Doppler ultrasonography of intrarenal arteries before and after radiologic treatment in obstructive uropathy.Radiol Med 1995;90:70-74.
8. Carmody E, Greene A, Brennan P, et al: Sequential Tc99m mercaptoacetyl-triglycine (MAG3) renography as an evaluator of early renal transplant function. Clin Transplant 1993;7:245-249.
9. Spicer ST, Chi K, Nankivell BJ et al: Mercaptoacetyltriglycine diuretic renography and output efficiency measurement in renal transplant patients. Eur JNuc Med 1999;26:152-154