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Value of antegrade ureteral dilation for late ureter obstruction in renal transplants

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Abstract. We report on eight kidney-allografted patients treated for delayed ureteral obstruction between January 1986 and January 1987. In all cases, standard endourological dilation was performed using a balloon catheter, and this was followed by insertion of a pigtail stent. All eight cases showed improvement 1 month after dilation (decrease in creatinine and caliceal dilation). At 6 months, renal function had deteriorated in six patients but remained good in two. One of the six patients was redilated with apparently good results. The remaining five were operated on using their own ureter. We conclude that while internal drainage helps in distinguishing between obstruction and other causes of creatinine increase, antegrade dilation is the treatment of choice for delayed ureteral obstruction.

Key words: Ureteral obstruction in renal transplantation - Antegrade ureteral dilation.

The viability of the ureter in renal transplants depends particularly upon its blood supply from the side of the kidney, so extreme care must be taken to preserve the blood supply during organ procurement.

The occurrence of urological complications after renal transplantation can be reduced by using a short, well-vascularized ureter [2]. Yet, even after this precaution has been taken, the risk of ureteral stenosis remains high and even increases with time: 4.6% after 1 year, 7.7% after 2 years, and 9.1% after 5 years [10, 15]. The overall incidence of ureteral stenosis at our institution is 2.9% (1100 transplants).

Endourological techniques have assumed an important role in the management of early urological complications in renal transplantation [1, 3, 6, 7, 9, 16]. However, treatment procedures for delayed ureteral stenosis are not unequivocal. In some cases, when there is no loss of graft function, a simple follow-up might be recommended. In other cases, surgical repair is indicated.

We report here on the use of antegrade ureteral dilation for the treatment of delayed ureteral stenosis.

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Patients and methods

Between 1986 and 1987, eight kidney-allografted patients were treated for ureteral obstruction. In all cases there was a ureterovesical implantation performed according to the Leadbetter Politano technique using a 2 cm submucosal tunnel. The epigastric vessels were always cut and ligated.

The mean time from renal transplantation to diagnosis of ureteral obstruction was 21.9 ± 13 months. Two of the eight patients had weak bladder compliance, but no true functional bladder lesion was present. The mean creatinine level was 220 ± 133 μmol/l (range: 100-400 μmol/l).

The diagnosis of ureteral obstruction was made using echography, intravenous pyelogram (IVP; Fig. 1), and ^{99m}Tc-diethylene triaminepenta-acetic acid renography with furosemide injection. A Whitaker test was never used.

An 18-gauge Chiba needle was inserted into the pelvis under echographic and fluoroscopic control, followed by localization of the stenotic level and insertion of a guide wire through the ureteral stenosis into the bladder. A balloon catheter (10 cm long and 7 mm in diameter) was then inserted over the guide wire. The balloon was inflated two times within 5 minutes and withdrawn after checking that the stenosis had disappeared after dilation. An 8 Fr double pigtail stent was inserted and left in place for 1 month. Prophylactic antibiotherapy during dilation consisted of ampicillin, oxacillin, and gentamicin; this was replaced by trimethoprim sulfamethoxazole after 2 days. If the first attempt to pass through the stenosis was unsuccessful (one case), a small modified Amplatz sheath (10 Fr) was introduced percutaneously into the pelvis. A flexible ureteroscope was then inserted, allowing for localization, catheterization, and dilation of the stenosis.

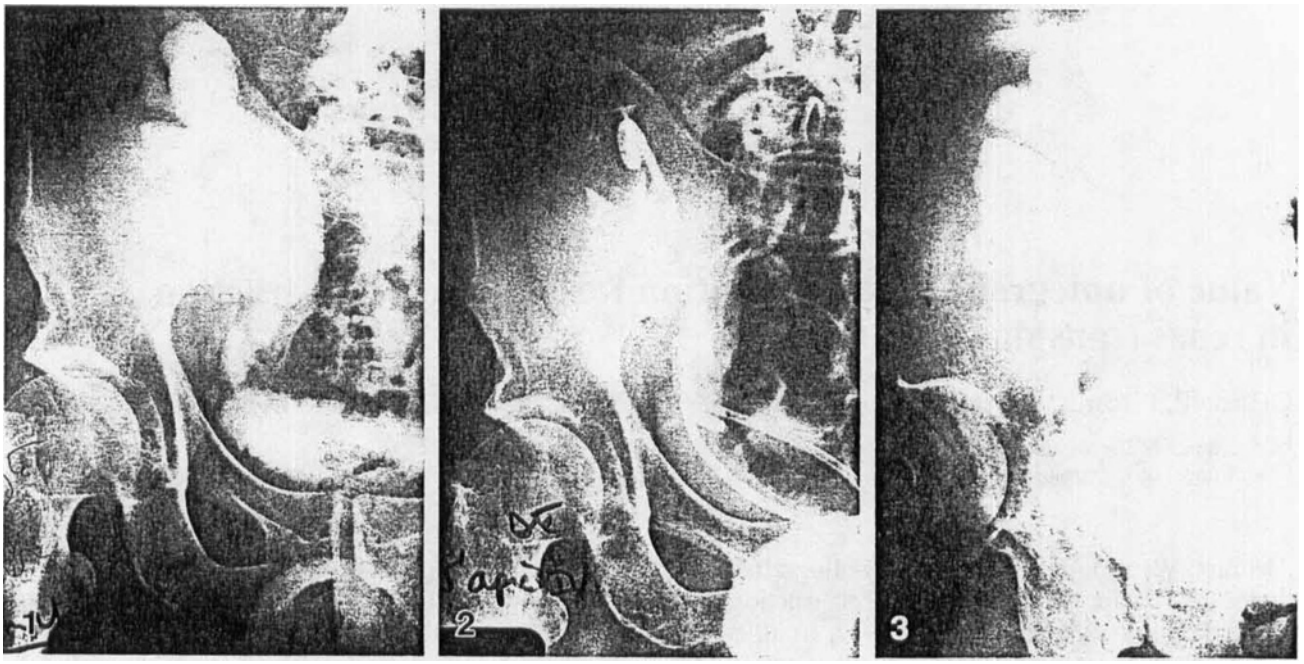

Fig. 1. Intravenous pyelogram (IVP) of one of the eight patients showing important ureteropelvicaliceal dilation

Fig. 2. IVP of the same patient 1 month after antegrade ureteral dilation showing spectacular improvement with a double J splint

Fig. 3. IVP of the same patient 6 months after antegrade ureteral dilation showing clear recurrence of hydroureteronephrosis

Results

An obstruction at the ureterovesical implantation was observed in all eight cases. In seven of these cases, a catheter was inserted and dilation was easily achieved; this was followed by ureteral stenting. As we were unable to stent the ureter in the last case, an endoscope was placed percutaneously, and this allowed for dilation of the stenosis. No negative side effects of dilation were observed.

After 1 month, renal function improved (mean creatinine: 140 ± 100 µmol/l). The IVP revealed regression of the stasis. The stent was then removed (Fig. 2).

After 6 months, these eight patients were reassessed. Renal function continued to improve in two patients but deteriorated in six patients in whom stasis had reappeared (Fig. 3). Of these six, one was redilated with satisfactory results. The remaining five were operated on transperitoneally with a ureteroureteral anastomosis using their own ureter. In all cases, renal function improved and the ureteral obstruction regressed. The pathological study revealed ureteral and periureteral fibrosis. We did not have any operative complications.

Discussion

The diagnosis of urinary tract obstruction in the case of deterioration of renal function is difficult, even when using repeated IVP.

An increase in serum creatinine is not helpful in every case since other factors, such as chronic rejection, cyclosporin nephrotoxicity, and renal artery stenosis, can influence renal function. In the case of stenosis, retrograde catheterization is quite difficult because the neo-meatus is not easily accessible using endoscopic techniques.

The site of the graft in the iliac fossa makes puncture of the pelvis easy through the convexity of the kidney, which reduces the incidence of urine leakage. We therefore obtain a precise location of the stenosis by an echo-guided percutaneous puncture, which allows a percutaneous nephrostomy or stenting of the ureter [11, 15, 17, 18].

The monitoring of the renal function under drainage is, in fact, the best way to confirm the diagnosis of obstruction. Our experience shows that internal drainage helps in distinguishing between obstruction and other causes of creatinine increase. However, we found that dilation of delayed ureteral obstruction with insertion of an 8 Fr stent frequently failed in the long term. Five out of eight patients had to undergo surgery after 6 months. However, it is always worth trying dilation, even if it means only 25% of one's patients can be cured and surgery can be avoided. In the present study, pathological examination of the ureteral stenosis revealed ureteral and periureteral fibrosis.

Liebermann et al. reported a case of a stenosis dilated percutaneously with good results after 7 months [12]. Streem et al. treated two stenoses with good results [18]. Van Gansbeke treated six stenoses percutaneously with good results in three [4], and Warner treated four, all of which relapsed [19]. These results confirm that the percutaneous approach to transplanted kidneys is easy and allows for dilation of ureteral stenosis. Failures of this method are generally due to periureteral fibrosis, which is a characteristic feature of delayed ureteral stenosis.

Ureteral stenosis occurs frequently after renal transplantation. When loss of renal function occurs in association with urinary tract dilation, the percutaneous approach to the transplanted kidney, in combination with stenting, is a good method for monitoring the function of the graft and for confirming obstruction as the possible cause of deterioration of the renal function. Although antegrade dilation shows less than 30% favorable results, it is the preferred procedure for the initial treatment of ureteral stenosis.

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