Equivocal pelvi-ureteric junction obstruction manifesting in a renal transplant recipient

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ABSTRACT

Partial and intermittent pelvi-ureteric junction obstruction (PUJO) can potentially confound the diagnosis of upper tract obstruction. We report the case of a gentleman who received a renal graft from his sister. The donor kidney had a box-shaped extra-renal pelvis, which showed unobstructed drainage on the diuretic renogram. However, it manifested in the recipient as PUJO, and he needed pyelo-native ureterostomy for deteriorating graft function. The purpose of this report is to highlight a seemingly innocuous entity in the donor that may manifest in the recipient with significant consequences on graft function. It also discusses the appropriate timing of intervention in these cases.

Key words: Box-shaped pelvis, partial pelvi-ureteric junction obstruction, pyelo-native ureterostomy, renal transplant recipient

INTRODUCTION

The ideal test to determine upper tract obstruction still does not exist. Partial and intermittent pelvi-ureteric junction obstruction (PUJO) are known confounders in the determination of obstruction of a renal unit. The use of such a kidney for transplantation can cause decompensation of the pelvi-ureteric junction (PUJ) with serious consequences in the recipient.

CASE REPORT

A 32-year-old Asian male underwent a live-related renal transplant for end-stage renal disease in May 2001. His native kidney disease was unknown. He received a haplo-matched kidney from his sister with triple immune-suppression regimen (Cy-Myc-Pred). Imaging of the donor showed a box-shaped extra-renal pelvis on the right side [Figures 1 and 2]. The donor

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never had any symptoms and the preoperative well-tempered diuretic renogram revealed a normal drainage pattern with no evidence of obstruction. Intraoperatively, there was excellent drainage of the renal unit, even after stressing the system with administration of Frusemide, and an uneventful right donor nephrectomy ensued. No stent was placed in the recipient.

Two weeks after surgery, the recipient developed anuria and a rising serum Creatinine. Evaluation showed hydronephrosis of the allograft kidney, with the renogram revealing obstructed drainage. A percutaneous nephrostomy (PCN) was inserted and his graft function improved. A nephrostogram was done once nadir serum creatinine (1.8 mg%) was attained. It showed unobstructed drainage and the nephrostomy was removed.

Over the next 5 months of follow-up, he had stable graft function maintaining a creatinine of 1.6-1.8 mg% with good urine output and no pain over the graft. Six months post-transplant, a repeat diuretic renogram showed normal drainage [Figure 3] and he was referred to his primary nephrologist with a nadir creatinine of 1.7 mg%. At this time he was on triple immunosuppression regimen of Cyclosporine, Mycophenolate Mofetil and Prednisolone. He was subsequently followed up at his local nephrologist with a yearly visit to our institution. His renal function remained stable during this interval (serum creatinine of 1.6-1.9 mg%).

Three years later, he presented with pain over the graft site and a rise in serum creatinine to 2.6 mg% over 2 months. He underwent US-guided upper calyceal puncture and antegrade pyelography. Complete washout of contrast was demonstrated within 20 minutes of administration of Frusemide. Diuretic renogram also showed no obstruction to drainage. Renal biopsy showed chronic allograft rejection. He was managed medically (anti rejection therapy, drug levels) and his serum creatinine at discharge was 1.7 mg%.

Over the next 5 years his serum creatinine remained stable at 2-2.2 mg% with mild hydronephrosis of the graft. However, 9 years post-transplant he presented with heaviness in the lower abdomen. Examination revealed graft tenderness. He had no hematuria, calculuria, fever or UTI. Evaluation showed increasing hydronephrosis and a rise in creatinine to 3.9 mg%. A PCN was inserted into the graft kidney. A nadir creatinine of 2.3 mg% was reached a month later and an antegrade nephrostogram was performed. It showed prompt drainage of contrast [Figure 4] and he was planned for PCN removal. However, on clamping the PCN, he developed peri-tubal leak associated with lower abdominal pain. He underwent antegrade stenting following which the urine leak and pain settled. His serum creatinine reached 2.1 mg% and a decision to perform a pyelo-native ureterostomy was taken.

Intra-operatively, the PUJ was seen on the posterior aspect of the graft kidney with morphology suggestive of primary PUJO. The PUJ was dismembered and a pyelo-native ureterostomy was performed over a stent. His postoperative period was uneventful. Biopsy of the excised segment
showed mild suburothelial chronic inflammation with no evidence of viral cytopathic changes.

The stent was removed 3 weeks later. Retrograde pyelography done at that time revealed a patent anastomosis with no extravasation [Figure 5]. At 6-weeks postsurgery his serum creatinine had reached a nadir of 2.2 mg/dL and diuretic renogram showed unobstructed drainage.

**DISCUSSION**

A borderline or intermittent PUJO remains a challenge to diagnose. The diuretic renogram remains the mainstay in determining upper tract obstruction; however, equivocal results are obtained in 15-17% of cases. Modifications, like the F-15 or F +0 renogram, may reduce this to about 3%, but doubt remains in many cases of partial or intermittent obstruction. This case is unique because there was a suspicion of the pathology in the donor but no obstruction was demonstrated on the preoperative renogram. In fact a type I curve was obtained. Intraoperatively there appeared no obstruction to drainage. Postoperatively, when the allograft kidney was diuresing, it is possible that the increased volume load resulted in a PUJO necessitating a percutaneous nephrostomy. Repeated follow-up studies, however, did not reveal significant obstruction.

Whitaker’s test traditionally has been touted as the gold standard to diagnose upper tract obstruction. However, it too, has false positive and false negative results in 10-20% of cases. The Whitaker test is not performed at our institution, as we remain unconvinced of its utility. Ultimately, the diagnosis of upper tract obstruction remains a classic example of the ‘art’ of clinical medicine.

Shabtai et al. reported a similar case in which the donors’ intravenous urogram (IVU) showed dilatation of the renal pelvis. No further functional studies were performed as the appearance was thought consistent with an extra-renal pelvis. The recipient had a normal graft function for 6 months but then developed rapid deterioration and eventually underwent a non-dismembered Foley’s Y-V pyeloplasty. The possible mechanisms contributing to this are discussed in their paper. They include increased volume load on a single unit, periureteral fibrosis from the surgery itself or from any immune reaction, the natural progression of the partial obstruction to a complete one, and autonomic denervation of the kidney as a result of harvesting.

The possibility of proceeding with surgical intervention as soon as the patient developed obstructed drainage in the early postoperative period is worth considering. The nephrostogram at 1 month showed prompt drainage and the surgery was deferred. We thought it unlikely that such a situation would repeat itself but were proven wrong.

Pyelo-native ureterostomy has been traditionally considered the procedure of choice for this condition. We too believe that the pyelo-native ureterostomy offers the best chance of success in such a case. The vascularity of the native ureter is uninterrupted and offers the best possibility of healing. The native ureter is in a virgin surgical territory thereby obviating the technical difficulty of a conventional pyeloplasty in a previously operated field. Last but not least, it allows the use of the native antirefluxing vesico-ureteric junction, which could prove important in reducing graft pyelonephritis in this already immuno-compromised population.

Endopyelotomy of the PUJ has also been tried with variable success. Other options include the Foley’s non-dismembered pyeloplasty, the conventional Anderson-Hynes pyeloplasty and balloon dilatation.

Ho et al. reported the use of a kidney with diagnosed PUJO which was used for transplant. During the transplant, a pyelo-native ureterostomy was performed with good postoperative success.

**CONCLUSIONS**

Box-shaped extra-renal pelvies are usually considered a normal variant of PUJ anatomy. However, kidneys with partial and intermittent PUJO may show a similar morphology. A functional study like a renogram must always be done prior to transplant, although that may still not guarantee normal drainage in the recipient. If any doubt exists, it may be worth considering a primary dismembered procedure or a pyelo-native ureterostomy during the initial transplant operation itself.

**REFERENCES**

1. Taghavi R, Ariana K, Arab D. Diuresis renography for differentiation of upper urinary tract dilatation from obstruction F+20 and F-15 methods. Urol J 2007;4:436-40.
2. Wolf J, Siegel CI, Brink JA, Clayman RV. Imaging for ureteropelvic junction obstruction in adults. J Endourol 1996;10:93-104.
3. Shabtai M, Nativ O, Dreznik Z, Jacob ET. Decompensated ureteropelvic junction obstruction in renal allograft. J Urol 1988;139:578-9.
4. Schumacher M, Studer UE, Danuser H. Antegrade endopyelotomy for treatment of ureteropelvic junction obstruction in transplanted kidneys. J Endourol 2006;20:305-8.
5. Waltzer WC, Gonda A, Lehr H, Jao S, Anaide D, Frischer Z, et al. Management of transplant ureteropelvic junction obstruction by dismembered pyeloplasty. Transplant Proc 1985;17:2149-51.
6. Shoskes, DA, Hanbury D, Cranstion D, Moms PJ. Urologic complications in 1,000 consecutive renal transplant recipients. J Urol 1995;153:18-21.
7. Ho TP, El-Sheikh MF, Talbot D. Case report: Living related renal transplantation with a donor kidney with pelviureteric junction obstruction using an Anderson-Hynes pyeloplasty. Transplant Proc 2002;34:1193-4.

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