

# Peritoneal Implantation of Ureter in a Cadaveric Kidney Transplant Recipient

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## Summary

We report here a case of a kidney transplant recipient in whom the ureter was initially implanted into the peritoneum. Excessive ultrafiltration volume and reversal of serum vs dialysate creatinine ratio when the patient was recommenced on continuous ambulatory peritoneal dialysis first suggested the diagnosis which was subsequently confirmed by a plain abdominal x-ray demonstrating placement of ureteric stent in the peritoneum. This rare complication was successfully corrected with surgical re-implantation of ureter into the bladder and 5 years later, the patient remains well with good graft function.

**Key Words:** Kidney transplant, Ureter, Implantation, Peritoneum, Continuous ambulatory peritoneal dialysis

## Case Report

FAR was 22 years old when she presented with end stage renal failure due to bilateral small kidneys in 1995. She was commenced on renal replacement therapy with continuous ambulatory peritoneal dialysis (CAPD) and 2 years later, she received a cadaveric kidney transplant. The donor was a 50-year-old man with brain death due to massive intracerebral haemorrhage. His serum creatinine reached a peak of 230  $\mu\text{mol/l}$  (from a baseline of 150  $\mu\text{mol/l}$ ) with urine output maintained in excess of 100  $\text{mls/min}$  at the time of harvest. The transplant operation was uneventful although there was delayed graft function (DGF). Induction immunosuppression consisted of anti-thymocyte globulin, steroids and azathioprine. She was in the meantime recommenced on CAPD and subsequent serial renal biopsies and ultrasound doppler of the renal graft over the next 4 weeks suggested predominantly acute tubular necrosis

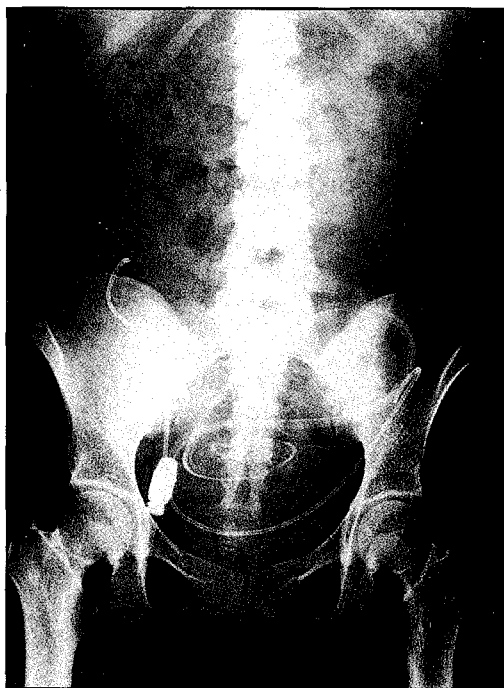
and mild acute rejection. At 4 weeks post transplant, her urine output remained minimal but ultrafiltration per day was noted to be more than twice her usual daily ultrafiltration volume. At the same time, her serum creatinine had fallen to about 700  $\mu\text{mol/l}$  from her usual pre-transplant serum creatinine of 900  $\mu\text{mol/l}$ . Simultaneous sampling of her serum and dialysate fluid showed that her dialysate creatinine concentration was higher than her serum creatinine concentration (1085  $\mu\text{mol/l}$  and 694  $\mu\text{mol/l}$  respectively). Diversion of urine into peritoneal cavity probably secondary to peritoneal implantation of ureter was suspected and this was confirmed with a plain abdominal X-ray (Figure 1) which showed that the ureteric stent was in the peritoneum instead of in the bladder. Reimplantation of the transplant ureter was immediately performed, which was accompanied by post-operative diuresis of 3000-4000mls of urine per day. Her serum creatinine

This article was accepted: 5 May 2003

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gradually came down to 180  $\mu\text{mol/l}$  and graft function has remained stable over the subsequent 5 years.



**Fig 1: Plain abdominal x-ray demonstrating peritoneal dialysis catheter and J-stent (arrow) within peritoneal cavity.**

### Discussion

Post-transplant urological complications have become less common especially since the introduction of newer techniques in kidney transplantation<sup>1,3</sup>. Reflux or extravasation of urine, ureteric necrosis, obstruction and haemorrhage remain the most common of reported urological complications that may occur although they

rarely result in graft loss<sup>4</sup>. Peritoneal implantation of the transplant ureter is a well recognised but uncommon complication. In a series of 1000 kidney transplants, only 2 cases of peritoneal implantation of ureter, both into thickened peritoneal tissue in CAPD patients were reported<sup>4</sup>.

Peritoneal implantation of transplant ureter can be easily confirmed when suspicion for the diagnosis is aroused. An unexplained rise in ultrafiltration volume in transplanted CAPD patients accompanied by a fall in baseline serum creatinine is highly suggestive of the diagnosis. In transplanted patients who have ureteric stents inserted, the diagnosis can be readily confirmed by a plain abdominal x-ray demonstrating peritoneal placement of ureteric stent. If a ureteric stent has not been inserted as part of the transplant operation, the diagnosis may be supported by a reduction or reversal in serum vs dialysis fluid creatinine ratio. Radio-nuclide imaging to corroborate peritoneal extravasation of urine may be helpful<sup>5</sup>. Definitive diagnosis will however require an exploratory operation.

This rare surgical complication of a kidney transplant operation has been reported only in patients previously on CAPD. It is more likely to occur in long term CAPD patients whose peritoneum has been thickened by chronic exposure to hypertonic dialysis fluids exacerbated by recurrent peritonitis. Awareness of this potential complication may help reduce the risk of inaccurately identifying the thickened peritoneum for bladder wall. In transplanted patients, especially those on CAPD, the threshold for suspicion of peritoneal implantation of ureter should be low particularly if there is unexplained delayed graft function. The diagnosis can be quickly confirmed radiologically in most cases and preservation of graft function can be readily established with surgical re-implantation of the ureter into the bladder.

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