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BRIEF REPORT

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Endo-urological techniques in the management of stent complications in the renal transplant patient

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Abstract Complications following renal allograft transplantation have been well documented and, despite improvements in technique, continue to cause significant morbidity and mortality. The placement of indwelling ureteric stents is becoming more common both during primary neo-ureterocystostomy and in the management of subsequent ureteric complications. We present two cases of stent encrustation and urolithiasis treated by a combined percutaneous and flexible ureterorenoscopic approach. These cases illustrate the problems of stents in renal transplant patients and offer endo-urological solutions. It is imperative that stents are correctly placed in these patients and that appropriate plans are made for their removal or exchange.

Keywords Transplant · Calculus · Stent · Complications

Introduction

The early ureteric complications of renal transplantation including obstruction, and urinary leak, continue to occur despite modifications in the technique for vesico-ureteric anastomosis [4, 9, 10]. Recent studies (post-1986) have yielded rates of 2%–16% for these complications [4, 10]. Interventional radiology has revolutionised the management of these patients. In some centres, up to 95% [10] of transplant recipients with ureteric obstruction are being treated by percutaneous nephrostomy (PCN) and balloon dilatation with or without stent insertion. Ureteric re-implantation is being reserved for more difficult cases. Urinary leaks without obstruction have been treated in the main by open surgery, most often by ureteric re-implantation with or without stenting. In some studies however, PCN and stent insertion have successfully treated urinary leak [1, 8]. Vesico-ureteric anastomosis using a stented extra-vesical technique is gaining popularity, with low primary complication rates of below 2% [2].

However, stents have their own morbidity, including increased risk of urolithiasis, infection (bacterial and mycotic) and encrustation [6, 7]. Signs of encrustation are seen in 76% of modern polyurethane stents 12 weeks after insertion [3]. Though upper tract urolithiasis is probably no more common in the transplanted kidney, with incidences ranging from 0.05%–1.5% [7], it can be difficult to treat, especially when it co-exists with ureteric stent encrustation. We present two cases of renal transplant stent encrustation and urolithiasis treated by a combined percutaneous and flexible ureterorenoscopic approach.

Method

The procedure is performed under general anaesthetic. Access to the allograft is obtained as with previously described techniques for transplant percutaneous nephrolithotomy (PCNL) [5]. A hydrophilic guidewire is placed antegradely and retrieved from the bladder. This is then converted to a standard guidewire to provide a through-and-through safety wire. At this stage, the stent is approached retrogradely with an over-guidewire

insertion of the flexible ureterorenoscope. Holmium:yttrium aluminium garnet (Ho:YAG) laser lithotripsy may then be employed to de-calcify the stent. The stent is then removed either via the retrograde route or divided with endoscopic scissors and partly removed in an antegrade manner.

Case reports

Case 1

A 59-year-old man presented with end-stage renal failure secondary to glomerulosclerosis. He underwent right cadaveric first renal transplantation with onlay neo-ureterocystostomy. Postoperative recovery was complicated by re-exploration, on day 42, for ureteric obstruction secondary to ischaemic necrosis. Uretero-ureterostomy (anastomosis of transplant ureter to native ureter) was performed over a ureteric stent following division of the native ureter. Unfortunately, the presence of the stent was overlooked, and 6 months later, at attempted removal, it was noted to be heavily encrusted along its entire length with calculus, in the renal pelvis (Fig. 1).

PCNL was performed and calculus and stent tip removed. A guidewire was then inserted antegradely and retrograde flexible ureterorenoscopy (FURS) and stent decalcification undertaken with Ho:YAG laser prior to retrograde removal. The nephrostomy was removed uneventfully 2 weeks postoperatively.

Case 2

A 52-year-old man presented with end-stage renal failure and tertiary hyperparathyroidism secondary to adult polycystic kidney disease. His hypercalcaemia was resolved with oral calcium and alfacalcidol treatment. He received a cadaveric renal transplant 1 year after commencing dialysis. This was associated with a postoperative ureteric leak, and he underwent re-exploration with a stented ureteric re-implantation. Stent removal was overlooked, and 5 months later an encrusted stent was removed via PCNL. A 1-cm ureteric stricture at the pelvi-ureteric junction was balloon dilated prior to the re-stenting (Fig. 2).

Three months on, the stent was changed, and after a further 3 months the stent was again noted to be encrusted. On this occasion, heavy encrustation accompanying transplant calculi necessitated PCNL and litholapaxy with stone punch followed by retrograde FURS and decalcification with Ho:YAG laser. The stent was then removed in an antegrade manner. The nephrostomy was removed several days later, and follow-up imaging at 3 months was normal.

Fig. 1 Heavily encrusted ureteric stent in situ

Discussion

Our experience illustrates the value of PCNL and antegrade guidewire placement to facilitate retrograde flexible ureterorenoscopic access to the transplant ureter. Both patients had previously undergone uretero-ureterostomy, which created several 180 ° bends and made ureteroscopic access particularly difficult. Ho:YAG lithotripsy was then used to clear stent urolithiasis and allow removal of even more-heavily encrusted stents percutaneously without recourse to open surgery.

These cases highlight the importance of having a stent registry in renal transplant units, with planned removal schedules, in order to avoid the type of complications described above. Though extra-corporeal shockwave lithotripsy may be attempted in patients with encrusted stents in native kidneys, it has not been recommended in cases of severe encrustation (> 3 mm of stent) or where the renal function is poor, and may be less useful in the transplanted kidney [11]. In the case of severe encrustation, stents may be impossible to retrieve by cystoscopy or PCNL alone, and a combined retrograde and antegrade approach, including flexible ureteroscopy, may be the only solution short of open surgical retrieval.

Fig. 2 Ischaemic stricture of transplant ureter

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