The first use of Resonance® metallic ureteric stent in a case of obstructed transplant kidney

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ABSTRACT

INTRODUCTION: To date, double JJ stent is the mainstay ureteric stent used in a transplant kidney. We herein report the first use of Resonance® metallic ureteric stent to manage ureteric obstruction in a transplant kidney.

PRESENTATION OF CASE: A 45-year-old lady underwent an uneventful living related donor renal transplantation. Due to post-operative pelvi-ureteric obstruction and recurrent obstruction following multiple distal stent migration and expulsion necessitated frequent nephrostomy insertion and antegrade stenting, she underwent challenging but successful retrograde insertion of a 12 centimetres long and size 6.0 French Cook Resonance® metallic ureteric stent which was performed under general anaesthesia.

DISCUSSION: Metallic ureteric stents are a fairly recent introduction to modern urology and they have been successfully used in the management of benign and malignant obstruction of ureter.

CONCLUSION: This is the first case of therapeutic metallic ureteric stent insertion in a transplant kidney.

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1. Introduction

Following kidney transplant, significant urologic complications can be encountered in up to 33 per cent of the cases.1 Amongst these, ureteric stenosis is a well-established post-operative problem requiring temporary or permanent therapeutic ureteric stenting.2 To date, double JJ stent is the mainstay ureteric stent used in transplant kidney3 and the use of metallic ureteric stent in a patient with kidney transplant has not been described in the literature previously.

2. Presentation of case

At a different centre, a 45-year-old lady underwent an uneventful living related donor renal transplantation. However, following subsequent removal of the transplant ureteric stent, she developed an acutely obstructed urinary system with marked hydronephrosis of the transplant kidney, requiring antegrade nephrostomy insertion and, thus, corresponding to Clavien Grade III surgical complication.4

Subsequent nephrostogram concluded pelvi-ureteric obstruction. Despite surgical exploration and stenting, recurrent obstruction following multiple distal stent migration and expulsion necessitated frequent nephrostomy insertion and antegrade stenting. Subsequently, the patient was referred to our centre for second opinion.

After detailed multi-disciplinary review of her case along with review of previous radiology images, an extremely challenging but successful retrograde insertion of a 12 centimetres long and size 6.0 French Cook Resonance® metallic ureteric stent was performed under general anaesthesia (Figs. 1–3). Difficult retrograde access of the transplanted ureter required intra-operative support of a team of urologists and radiologists, with radiation exposure dose of 520 CGy cm2 and fluoroscopy duration of 4 min and 58 s.

The patient made a successful recovery with no immediate complications and no stent-related symptoms or complications within 4 months after surgery. The current management plan is to exchange her metallic stent on yearly basis as recommended by the manufacturer.5

3. Discussion

Since the introduction of double JJ stents in 1970s, their use in urological practice has become increasingly common.6 With an increase in the usage of these stents, a significant number of possible complications are observed including stent infection, blockage, migration, encrustation, calcification formation and breakage of stent.7

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The use of double J stent in a transplant kidney is usually reserved for ureteric stenosis or blockage following surgery and the benefit of routine, prophylactic and temporary stent insertion following a kidney transplant is still debatable.

An alternative to polymer stents, metallic ureteric stents are a fairly new introduction to modern urology. Resonance metallic stents have been successfully used in the management of benign and malignant obstruction of the ureter. It has been shown that resonance stents are more resistant to compression than polymer stents due to their tensile strength. This largely explains the promising results from patients with benign ureteric obstruction treated by metallic stent insertion.

4. Conclusion
To our knowledge, this is the first case of therapeutic metallic ureteric stent insertion in a transplant kidney allowing longer patency time and hence less frequent exchange procedures.

Conflict of interest
The authors declare no conflict of interest related to this case report.

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Ethical approval
Written informed consent was obtained from the patient for publication of this case report and case series and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions
Mr. Mohamed I Abdulmajed reviewed the patient, assisted in theatre, prepared the images and wrote the manuscript; Dr. Vaughan W. Jones reviewed the images pre-operatively and assisted intra-operatively; Mr. Iqbal S. Shergill is the primary surgeon performing the procedure we are reporting. He also proofread the manuscript prior to submission.

References
1. Wilson CH, Bhatti AA, Rix DA, Manas DM. Routine intraoperative ureteric stenting for kidney transplant recipients. Cochrane Database Syst Rev 2005;4:CD004925.
2. Kassarelos I, Koukoulaki M, Georgantas T, Bairamidis E, Kokkinos C, Leronymou M, et al. Ureteral complications in renal transplant recipients successfully treated with interventional radiology. Transplant Proc 2008;40(9):3170–2.
3. Gomes G, Nunes P, Castelo D, Parada B, Patrao R, Bastos C, et al. Ureteric stent in renal transplantation. Transplant Proc 2013;45(3):1099–101.
4. Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. Ann Surg 2004;240:205–13.
5. https://www.cookmedical.com/data/resources/productReferences/URO-BM-RMUSBR-EN-201010.pdf
6. Joshi HB, Okeke A, Newns N, Keeley Jr FX, Timoney AG. Characterization of urinary symptoms in patients with ureteral stents. Urology 2002;59:511–6.
7. Slaton JW, Kropp KA. Proximal ureteral stent migration: an avoidable complication? J Urol 1996;155:58–61.
8. Damji S, Atinga A, Hakim D, Hakim N. Ureteric stenting in kidney transplants. Exp Clin Transplant 2013;11(2):109–11.
9. Rao MV, Polcari AJ, Turk TM. Updates on the use of ureteral stents: focus on the Resonance® stent. Med Devices 2011;4:11–5.
10. Christman MS, L’esperance JO, Choe CH, Stroup SP, Auge BK. Analysis of ureteral stent compression force and its role in malignant obstruction. J Urol 2009;181:392–6.
11. Pedro RN, Hendlin K, Kriedberg C, Monga M. Wire-based ureteral stents: impact on tensile strength and compression. Urology 2007;70:1057–9.
12. Polcari AJ, Hugen CM, Lopez-Huertas HL, Turk MT. Cost analysis and clinical applicability of the Resonance metallic ureteral stent. Expert Rev Pharmacoecon Outcomes Res 2010;10:11–5.