Case Report

Minimal invasive treatment of benign anastomotic uretero-ileal stricture in Hautmann neobladder with thermoexpandable ureteral metal stent

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ABSTRACT

Technical challenges and increased morbidity of open reconstruction for uretero-ileal strictures have led to a search for minimal invasive treatments as an alternative solution. The insertion of a thermo-expandable ureteral Memokath 051® metal stent across benign uretero-ileal anastomotic stricture in orthotopic neobladder has not been described in the English literature. Herein, we describe a case of a woman with a Hautmann neobladder and a 3.5 cm benign stricture of the right uretero-ileal anastomosis that was treated with insertion of a thermo-expandable ureteral Memokath 051® metal stent.

Keywords: Endourology, ileal neobladder, Memokath, metal stent, stricture, ureter

INTRODUCTION

Anastomotic stricture is a potentially serious complication after uretero-ileal anastomosis in orthotopic urinary diversion. Open revision remains the gold standard for the management of such strictures. However, endourological procedures (e.g. balloon dilatation, Acucise® cutting balloon, endoureterotomy or laser ureterotomy) are minimally invasive options associated with lower morbidity but yield lower success rates.[1] The Memokath 051® stent (PNN Medical A/S, Denmark) has been shown to be an attractive long-term and cost-effective solution for uretero-ileal strictures.[2,3] It is a thermoexpandable nickel–titanium alloy spiral ureteric stent. Its thermosensitive "shape memory" allows softening at temperatures less than 10°C and returning to a pre-formed shape and expanding at a temperature above 55°C. It has a shaft diameter of 10.5 F and a fluted end that expands to 22 F. Available lengths range from 30 to 200 mm. The Memokath 051® has a tight spiral structure due to which it is resistant to extrinsic compression and prevents urothelial ingrowth. Moreover, the stent adapts to the natural curves of the ureter, reducing the risk of ischemic injury to the ureteric wall and preserving ureteric peristalsis. These characteristics allow easy insertion and removal of the stent.[2] We present a case of retrograde insertion of a thermo-expandable ureteric Memokath 051® metal stent across a benign ureteroileal anastomotic stricture in a woman with a Hautmann neobladder.

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CASE REPORT

A 70-year-old female patient with a history of muscle invasive bladder cancer and radical cystectomy with Hautmann ileal neobladder 5 years ago has been treated for the last 2 years with balloon dilatation and conventional JJ stent changes for a stricture at the level of the right uretero-ileal anastomosis. In order for renal function to be preserved in the long term, a percutaneous nephrostomy tube was placed.

Diagnostic work-up showed the stricture to be 3.5 cm with absence of metastatic disease. A technetium-99m dimercaptosuccinic acid scan showed diminished function of the left renal unit (right to left ratio 75–25%). In order to remove the nephrostomy tube permanently, the benign nature of the stricture and the complexity of the case, insertion of a thermo-expandable ureteral Memokath 051® metal stent was planned. Informed consent and institution approval was obtained before the intervention.

The patient was placed in the lithotomy position with 15° elevation of the right flank. A nephrostogram under fluoroscopy was performed in order to delineate the exact length and position of the stricture. With the help of a 5 Fr curved angiographic catheter, a 150 cm hydrophilic coated guide wire of 0.027'' diameter was passed antegrade through the nephrostomy tube, into the neobladder. A 5 Fr ureteric catheter was advanced over this wire, which was then replaced with a super stiff 0.035'' diameter guide wire. By applying traction on both ends of the guide wire, a ureteric balloon dilator (Nephromax® 12 Fr, 4 cm, Boston Scientific) was inserted and positioned at the level of the stricture and dilation was easily performed. After dilatation, a second polytetrafluoroethylene guide wire 0.035'' diameter was inserted as a safety wire with the aid of a dual-lumen catheter. Thereafter, a 6 cm/10.5 Fr Memokath 051® was back loaded to the stiff wire in a retrograde fashion according to the manufacturers' instructions. After release of the stent, a nephrostogram showed free flow of the contrast from the right collecting system to the neobladder. An antegrade nephrostomogram was repeated the next day [Figure 1], which showed direct passage of contrast to the neobladder and the nephrostomy tube was then closed. Kidney function remained stable (pre- and post-operative creatinine was 1.7 mg/dL), the patient remained asymptomatic and the tube was removed 48 h later. The patient was discharged with instructions for follow-up after 1 month and every 3 months afterwards for the first year with an Xray-KUB, creatinine and renal ultrasound. Follow-up after 8 months shows the stent in place, stable creatinine and no dilation of the right kidney.

Figure 1: Antegrade nephrostomogram on the first post-operative day. Infusion of contrast material through the nephrostomy shows contrast flow in the neobladder and confirms the right position of the stent

DISCUSSION

The thermo-expandable ureteric metal stent has been available for the minimally invasive management of ureteric strictures for nearly two decades, with increasing indications of use. Long-term data have shown durable relief of ureteric obstruction and support its routine use in endourology units.[2,3] Patency rates vary between 90% and 100%, with the most common long-term complication being that of stent migration, with a rate of 14–20%.[4] It is interesting that a 21% rate of spontaneous resolution of benign strictures has been reported after a mean time of 9 months of indwelling time.[2] A serious drawback for its use is the stent cost, which however is offset if it is deployed for at least 12 months.[3]

Uretero-ileal strictures constitute a special subgroup of strictures. The placement of a metallic stent in these strictures is more challenging than for strictures in the native ureter and requires technical expertise. Access to the stricture is performed initially antegrade via the renal pelvicalyceal system, and this adds an extra difficulty for the endourologist for two reasons. First, a tortuous ureter that passes through the parietal peritoneum has to be negotiated and second, there is angulation of the anastomosis within the conduit. Most authors recommend antegrade access for initial manipulations in order to establish a "through-and-through" guidewire to immobilize and straighten the uretero-ileal anastomosis.[5] Our case was even more demanding due to the neobladder configuration and native urethra that we had to overcome. Further, distal identification of the stricture is more difficult after the dilatation, and this necessitates the accurate demarcation of the stricture at the early stages of the procedure. The stent must protrude into the conduit or the neo-bladder to be effective.[4] During the follow-up of the thermo-expandable ureteric metal stents, the urologist should be aware that they are more prone to migration when they are placed for uretero-ileal strictures than other strictures.[4] In our case, after 8 months the stent is still in place and, due to the high patency rate of this stent, follow-up with renal scintigraphy, at least in the short term, was not deemed necessary. Such procedures are not common and further data with greater numbers and longer follow-up are required.[2,3,5]

CONCLUSIONS

Placement of the thermo-expandable ureteric metal stent for benign uretero-ileal anastomotic stricture in orthotopic neobladder is feasible and effective.

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