Management of Transcecal Renal Transplant Nephrostomy

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Percutaneous nephrostomy is a well-established and safe technique used for urinary diversion in the renal transplant population. Renal transplant nephrostomy is often technically straightforward due to the superficial location of a transplant kidney. Occasionally, variable anatomy and comorbidity of the patient population results in a wider range of potential risks and complications. Traversal of bowel is one such complication, the management of which can be very challenging. This article describes such a complication and its management.

Case Report

A 59-year-old woman with a renal transplant 12 years previously underwent a nephrostomy tube placement 7 years later (5 years prior to presentation). She presented to interventional radiology for definitive management of intermittent watery diarrhea, possibly containing urine. An unenhanced computed tomography (CT) was performed revealing a transcecal nephrostomy tube with a nephroenteric fistula (►Fig. 1).

A nephrostogram was performed via the existing transcecal nephrostomy catheter to better define the anatomy of the nephroenteric fistula. Subsequently, using sonographic and fluoroscopic guidance, a 21-gauge AccuStick needle (Boston Scientific, Natick, MA) was advanced into a posterior inferior calyx of the transplanted kidney from a lateral approach away from overlying bowel. The needle was exchanged over a guidewire for serial dilators, and an 8F nephrostomy tube (Cook, Bloomington, IN) was inserted in standard fashion. A nephrostogram was performed, demonstrating the catheter to be in an intrarenal position with hydronephrosis due to long-standing ureteral occlusion (►Fig. 2).

The patient's previously placed 8F transcecal nephrostomy tube was exchanged over a J-wire for a 6F vascular sheath. Maintaining wire access, a tractogram was performed through the sheath, demonstrating a large-caliber channel of communication between a dilated calyx and the cecum.

Tandem guidewires were then placed through the sheath into both the cecum and transplant kidney (►Fig. 3). A 6F cecostomy catheter (pigtail catheter) was advanced over the wire and positioned within the cecum (►Fig. 4). The vascular sheath was advanced into the dilated calyx over the second guidewire, and using fluoroscopic guidance and tactile feedback a 12-mm Amplatzer plug (SJM, AGA Medical, St. Paul, MN) was deployed across the fistula (►Fig. 5). The right nephrostomy and cecostomy tubes were secured in standard fashion (►Figs. 6 and 7). The patient tolerated the procedure well without immediate complications.

A 2-month follow-up examination revealed no communication between the cecostomy tube and the nephrostomy tube (►Fig. 8). The cecostomy tube was removed after cecostomy tractogram confirmed the presence of a mature tract. Follow-up CT examination 4 months later confirmed appropriate positioning of the Amplatzer plug within the renal parenchyma (►Fig. 9). The patient has since been asymptomatic over a 5-month follow-up period.

Discussion

Complications related to percutaneous nephrostomy tube placement are well documented in both native and transplanted kidneys. The most common complications include bleeding, infection, and collecting system injury.¹ Rarely, bowel interposed between the kidney and the needle entry point may lead to transenteric nephrostomy tube placement though the colon (native kidney and renal transplant populations) or small bowel (renal transplant populations).²

Transenteric nephrostomy tube placement has historically been managed conservatively by placement of a new percutaneous nephrostomy tube (or internal ureteral stent) and conversion of the transenteric nephrostomy into a colostomy tube.³ This management allows for continued decompression of the kidney while minimizing flow through the nephroenteric fistula to facilitate closure; this strategy also allows the assessment of drainage adequacy and monitors for developing infection or abscess formation.¹ The colostomy tube

Figure 1 Unenhanced computed tomography demonstrates transcecal placement of indwelling nephrostomy tube with nephroenteric fistula. Solid arrow shows transcecal placement. Open arrow shows pigtail in transplant kidney.

Figure 2 Hydronephrosis with new nephrostomy tube (white arrow) in appropriate position. Black arrow indicates prior transcecal nephrostomy tube.

Figure 3 Tandem wire technique. Tandem guidewires were then placed through the sheath into both the cecum and transplant kidney.

Figure 4 Cecal catheterization while maintaining access to the transplant kidney. Black arrow shows wire in cecum. White arrow shows wire in transplant kidney.

should also be left in place long enough to allow maturation of the colostomy tract.⁴

In the patient presented here, the transenteric nephrostomy tube had been in place for several years and the maturity of the nephroenteric fistula and robust urinous diarrhea ultimately precluded conservative management. The patient was a poor surgical candidate, and the decision was made to place an Amplatzer plug within the renal parenchymal portion of the fistula to limit or ideally prevent flow through the

Figure 5 Amplatzer plug deployment across fistula. Arrow shows Amplatzer plug and deployment system.

Figure 6 Final image of cecostomy and nephrostomy tube.

Figure 7 Schematic representation of Amplatzer plug, cecostomy tube, and transplant nephrostomy tubes.

Figure 8 Two-month follow-up examination, following contrast injection via the nephrostomy tube, reveals no communication between the cecostomy (black arrow) and nephrostomy (white arrow) tubes.

Figure 9 Four-month follow-up computed tomography confirms the positioning of the Amplatzer plug (arrow) within the renal parenchyma.

nephroenteric fistula, thus encouraging preferential drainage through the nephrostomy tube.

The Amplatzer vascular plug used in this procedure is a self-expanding plug made of a Nitinol wire mesh attached to a 135-cm-long pusher wire; platinum marker bands aid in fluoroscopic visualization. The Amplatzer vascular plugs come in a variety of sizes and shapes ranging from 4 mm to 16 mm in 2-mm increments. There are four categories of shapes tailored to a variety of embolization parameters (i.e., low profile, short landing zone, variable landing zone, and high flow); a low-profile subtype was used in our patient. The Amplatzer plug has historically only been used for arterial and venous embolization procedures, and to our knowledge this is the first reported use in the treatment of a nephroenteric fistula.

References

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