Endoscopic Treatment of Complete Ureterointestinal Stenosis Without Antegrade Ureteroscopy

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Abstract

Background: Ureterointestinal stenosis is a frequent complication after radical cystectomy, occurring in up to 10%–12% of cases. Endoscopic treatment of complete stenosis has been described through double access, with antegrade flexible ureteroscopy and simultaneous retrograde endoscopy through the intestinal diversion. We present a case of endoscopic treatment without use of antegrade ureteroscopy.

Case Presentation: A 52-year-old man underwent surgery for peritoneal carcinomatosis secondary to mucinous adenocarcinoma. Ileocecal resection, omentectomy, sigmoidectomy, rectal resection, cystoprostatectomy, and ileal duct were performed. He had a complicated postoperative period because of enterocutaneous fistulas, peritonitis, and secondary intention wall closure, needing multiple surgeries. Four months later, he was diagnosed with left ureterointestinal stenosis, for which endoscopic management was the chosen treatment. Intraoperative diagnosis was complete stenosis. To locate the stenosis, methylene blue was instilled using a percutaneous ureteral catheter. With a resectoscope inserted through the ileal duct, the stenosis was observed and opened using cold knife and Collins knife. The stenosis was resolved satisfactorily.

Conclusion: Endoscopic management of complete ureterointestinal stenosis is a viable treatment option. Although stenosis localization has previously been described with two endoscopes using transillumination, we demonstrate another localization technique using methylene blue.

Keywords: ureterointestinal stenosis, endoureterotomy, endoscopic treatment

Introduction

URETEROINTESTINAL STENOSIS is a frequent complication after radical cystectomy, affecting up to 10%–12% of cases.¹ Endoscopic management has been described as a treatment option in these cases, especially in short stenoses of <1 cm. Success rates are estimated at between 50% and 70%, with complications in only 5% of cases.²

Complete stenosis represents an additional challenge in endoscopic treatment, since locating the stenosis is usually a difficult step in surgery. One procedure proposed to locate the complete stenosis is through combined access: percutaneous antegrade by flexible ureterorenoscope and retrograde through the intestinal segment, finding the area to be treated through transillumination (cut-to-the-light technique). In this study we describe an alternative for stenosis localization without using an antegrade endoscope.

Case Report

A 52-year-old man was operated in our center with a diagnosis of peritoneal carcinomatosis secondary to mucinous

adenocarcinoma. Ileocecal resection, omentectomy, sigmoidectomy, rectal resection, cystoprostatectomy, and ileal duct were performed. He had a complicated postoperative period because of enterocutaneous fistulas, peritonitis, and secondary intention wall closure, needing multiple surgeries. Four months later, a left ureterointestinal stenosis was diagnosed (Fig. 1) prompting placement of urgent percutaneous nephrostomy, and the patient was subsequently scheduled for endoureterotomy.

With the patient in the Valdivia position, an endoscopy was performed with a resectoscope through the ileal loop. The right ureteral meatus was viewed, but the left one was unlocalizable. An unsuccessful attempt was made to pass a wire from the left ureter anterogradely through the nephrostomy access. After performing left descending pyelography, complete stenosis was diagnosed on discovery that the contrast did not pass from the ureter to the ileal conduit.

We next sought to instill methylene blue through the catheter used for the descending pyelography in the left ureter, to check whether it would color any of the ileal loop area. The resectoscope was reintroduced into the loop,

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FIG. 1. CT scan to confirm dilatation of the renal pelvis and left ureter (**A**, coronal plane; **B**, axial plane).

detecting an area with a bluish tone. Fluoroscopy revealed that this area coincided with the tip of the ureteral catheter, at the distal end of the ureter (Fig. 2).

We next incised the bluish area using the cold knife, first observing the dye leakage to the ileal loop, and on extending the incision we located the wire in the ureter. It was then possible to pass the catheter and wire from the ureter to the ileal conduit (Fig. 3A, B).

Finally, the Collins knife was used to complete the endoureterotomy, extending the 12 o'clock incision into the stenotic area until reaching fat tissue (Fig. 3C). The procedure was completed with placement of a ureteral catheter, which the

patient retained until spontaneous expulsion three weeks after surgery. The hospital stay was prolonged by one month because of the patient's enterocutaneous fistulas. Stenosis resolution was confirmed in subsequent imaging tests at up to nine months' follow-up (renal pelvis without ureteral dilation) (Fig. 4).

Discussion

Endoscopic treatment of ureteroinestinal stenosis is a subject of interest in endourology, given that although open, laparoscopic, and robotic surgery are the most effective in this setting, they are technically complicated and entail

FIG. 2. (**A**) Resectoscope location of bluish area in the ileal conduit. (**B**) Fluoroscopy to confirm the area coincides with the tip of the ureteral catheter.

FIG. 3. (A) Cold knife incision over the colored area, with methylene blue leakage to the ileal conduit. (B) Wire (white) and catheter (green) from the ureter to the ileal loop. (C) Collins knife incision of the stenotic zone. The image shows the ureteral mucosa stained blue and fat tissue in the affected area, marking the limit of the endoureterotomy.

significant morbidity. Despite a lack of evidence, since in this area only case series have been published, several authors report acceptable success rates.³ Although different access routes have been described for endoscopic treatment of these stenoses, most authors opt for antegrade access.²

Complete stenosis represents a special case. Hu et al. studied a total of nine complete ureteroilestinal stenoses, in the largest series published to date. For the procedure and location of the stenosis, they describe simultaneous use of antegrade flexible ureterorenoscopy and semirigid ureteroscopy or retrograde nephroscope. In addition to interesting findings such as a lower success rate of endoureterotomy in complete versus partial stenosis, they proposed transillumination as a useful method to locate the segment to be treated.¹ The cut-to-the-light technique has already been described previously in isolated cases, showing good results.⁴

As far as we know, our case is the first in the literature in which the stenosis is marked using dye. This maneuver can be useful in cases where a flexible endoscope is not available for percutaneous access. In the case we present, we did not have a flexible instrument at that time, which is why we decided to

use methylene blue to locate the area to be treated. Although we have not experienced complications with this technique, the main limitations we found in use of dye is the need to ensure that the colored area wholly coincides with the area to be incised, between the ureter and the ileal loop. Use of fluoroscopy is essential to confirm this, as opening the ileal loop to the peritoneum could lead to fluid extravasation complications. Another possible drawback is that if the stenosis is not located after dye marking, use of an antegrade endoscope in the same intervention may be difficult, because of poor observation of the dye. Because of this, fluoroscopy is essential to check and confirm that both the loop and the ureter are contiguous or almost contiguous, since a complete and long stenosis could preclude marking the ileal loop.

In our patient we used cold knife and Collins knife for the incision technique. Although most publications describe use of some type of laser energy, none have demonstrated superiority over the others.³ Some of the advantages that we found with the use of the Collins knife over the laser are the possibility of performing mechanical traction because of the shape of the handle, or a lower cost of the intervention by

FIG. 4. CT scan to confirm stenosis resolution, renal pelvis without ureteral dilation (A, coronal plane; B, axial plane).

saving the laser fiber. Furthermore, in case of using a dilation balloon to invaginate the stenosis (Lovaco technique), with the holmium laser the possibility of breaking the balloon is greater than with the Collins knife.

Conclusions

Endoscopic management of complete ureterointestinal stenosis is a viable treatment option. Although location of the stenosis with two endoscopes (antegrade and retrograde) using transillumination has been previously described, we have presented another effective localization technique using methylene blue.

Disclosure Statement

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Abbreviation Used

CT = computed tomography

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