



Novel forward-viewing EUS-guided ileoureterostomy technique for recurrent pyelonephritis caused by ureteral stenosis

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Recently, EUS-guided fistulotomy has been widely applied during treatment for diseases of the bile duct,¹ gallbladder,² and pancreatic duct³ in addition to walled-off necrosis,⁴ but apparently it has not been applied to the ureter. This report describes our experience with EUS-guided ileoureterostomy to treat recurrent pyelonephritis caused by right-sided ureteral stenosis, complicated by the inability to pass a percutaneous guidewire (Video 1, available online at www.VideoGIE.org).

A man in his 80s had rectal cancer that had been treated by pelvic exenteration, ileal conduit diversion, and a colostomy in 2015. The cancer did not recur, but recurrent pyelonephritis developed 6 months later as a result of right-sided ureteral stenosis that subsequently required a right percutaneous nephrostomy (Fig. 1A). Several attempts at percutaneous penetration of the ureteral stenosis failed, and internal fistulation could not be achieved. Because the external fistula had been in place for a prolonged period, EUS-guided ileoureterostomy was planned in the hope of improving his quality of life. A balloon catheter was inserted percutaneously and advanced to a position just proximal to the ureteral stenosis. A forward-viewing (FV) XGIF-UCT160J-AL5 EUS endoscope (Olympus Medical Systems Corp, Tokyo, Japan) was inserted from the ileal stoma and advanced to the ileal conduit. The position of an inflated ureteral balloon was confirmed by FV-EUS. However, on insertion of the 19-gauge fine needle (EZ shot 3, Olympus), the balloon immediately ruptured and it was subsequently difficult to pass a 0.025-inch guidewire into the ureter. The ureter was also not adequately dilated and was very mobile, adding to the difficulty of guidewire introduction into the ureter (Fig. 1B).

We then used a 5F, 4-wire basket forceps (Cook Japan, Tokyo, Japan) inserted through the nephrostomy instead of using the balloon. EUS showed 4 linear hyperechoic lesions clearly, which represented the basket forceps. We punctured

the ureteral wall using the Seldinger technique and inserted the guidewire into the ureter. The basket forceps was then used to grasp the guidewire and pull it through to the side of the nephrostomy (Fig. 1C). The fistula was dilated by use of a 6-mm balloon, and then an 8F 68-cm pigtail nephroureteral stent catheter with 5 side holes in each pigtail site (Uresil, Skokie, Ill, USA) was inserted percutaneously over the guidewire in a rendezvous fashion (Fig. 1D). Subsequently, internal fistulation was effectively performed. We used 2 days of prophylactic antibiotics (tazobactam/piperacillin) before and after the procedure. There were no adverse events during or after the procedure.

With the creation of the internal fistula, the percutaneous nephrostomy was closed, allowing the patient's quality of life to improve. We currently perform regular exchange of the pigtail catheter every 3 to 4 months. However, we will consider changing the pigtail catheter for a stent to further improve his quality of life.

Treatment options for severe ureteral stenosis after ileal conduit diversion comprise only external drainage, or surgical correction if a guidewire cannot pass the stenosis.⁵ FV-EUS-guided ileoureterostomy can be a novel option for treating refractory ureteral stenosis after ileal conduit diversion. The application of this procedure might be infrequent, but when the need arises, we should keep this novel technique in mind to help resolve the limitations of a percutaneous procedure and ultimately improve the patient's quality of life.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

Abbreviation: FV, forward-viewing.

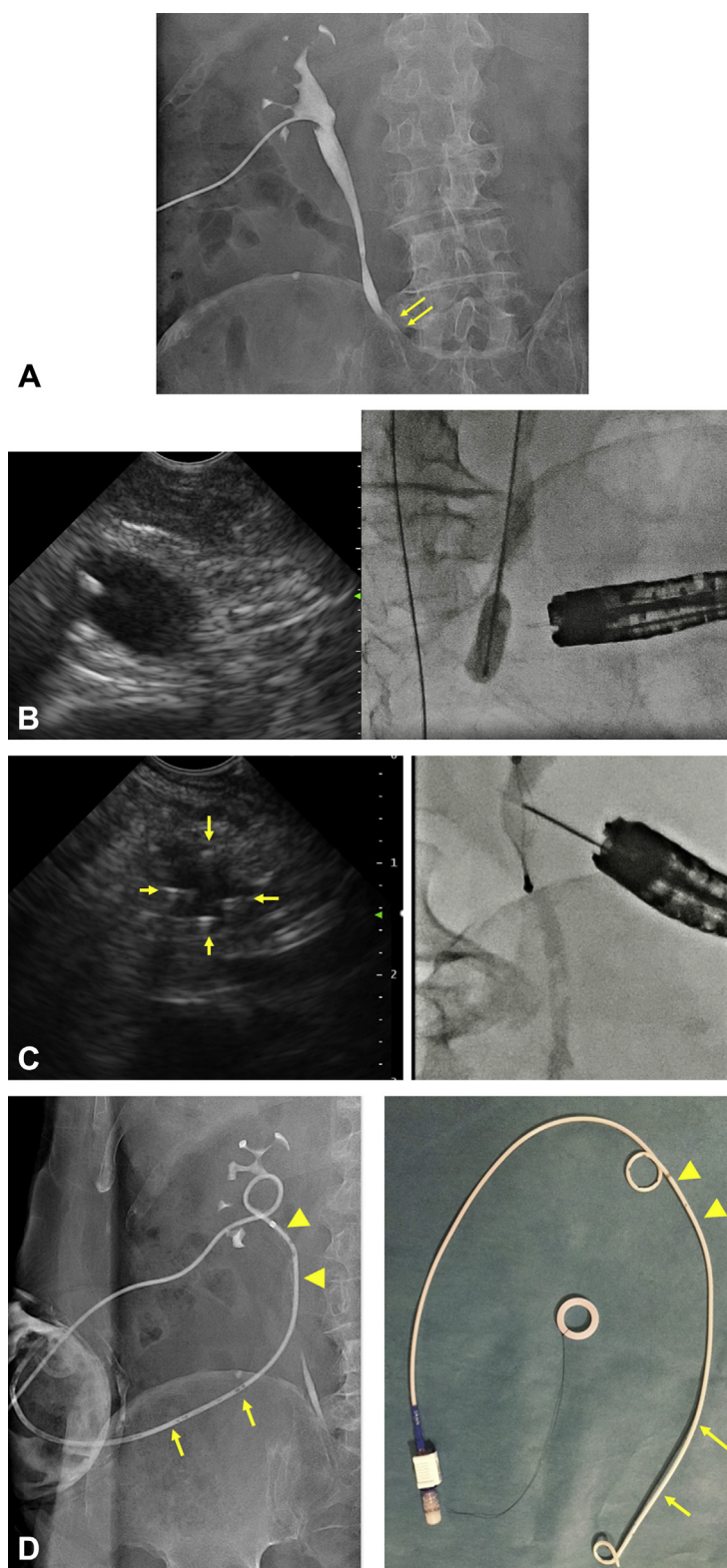


Figure 1. Images of ureteral stenosis and procedures. **A**, Ureterographic view from nephrostomy showing ureteral stenosis (*arrows*). **B**, Puncture by use of forward-viewing EUS with the balloon as a guide. **C**, EUS view clearly showing 4 linear hyperechoic lesions (*arrows*). Puncture of the ureteral wall as the guide for basket forceps. **D**, 8F 68-cm pigtail nephroureteral stent catheter with 5 side holes in each pigtail site inserted percutaneously over the guidewire in a rendezvous fashion (*arrows*, stent in ileal conduit; *arrowheads*, stent in ureter).

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