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CASE REPORT

Endourological autologous bypass-ureteroplasty for anastomotic atresia in orthotopic neobladder: a novel surgical approach and case report

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Background: *Ureteroenteric anastomotic stricture is a common complication after ureteral diversion with radical cystectomy, which leads to hydronephrosis, infection, and chronic renal failure. Although ureteroneocystostomy is reliable, its high degree of invasion often causes great damage and postoperative complications in patients. Therefore, we offer a new endoscopic approach with relatively limited invasion for severe obstructions such as ureteroenteric anastomotic atresia.*

Case Description: *A 65-year-old man underwent radical cystectomy and urinary diversion of orthotopic neobladder and standardized chemotherapy for high-risk non-muscle-invasive bladder cancer. Severe left hydronephrosis was then detected due to ureteroenteric anastomotic atresia. Percutaneous nephrostomy was performed to preserve renal function. Based on our previous experience in ureteral bypass construction utilizing the Allium ureteral stent, the patient received a successful endourological autologous bypass-ureteroplasty to treat ureteroenteric anastomotic atresia in an orthotopic neobladder and maintained mild hydronephrosis with a stent-free in the follow-up.*

Conclusions: *The case offers an innovative and promising surgical modality to overcome the limitations of the existing endourological techniques, which often require long-term placement of ureteral stents to maintain drainage and are associated with stent-related symptoms. Compared to traditional ureteroneocystostomy, endoscopic treatment offers advantages such as minimal invasiveness and fewer postoperative complications. With advancements in related techniques, endoscopic management has become a promising alternative for selected cases.*

Key Words: endourology, autologous bypass, anastomotic atresia, orthotopic neobladder, case report

Introduction

Bladder cancer is the 10th most common cancer worldwide, with 5-year survival rates ranging from approximately 10% (including metastatic disease) to 97% (carcinoma *in situ*).[1] With the aging population, the global incidence of bladder cancer has increased significantly and is expected to continue rising over the next two decades, which and pose a significant challenge to healthcare systems worldwide.[2] Although the modern multidisciplinary

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collaboration model provides diverse treatment modalities, represented by microbial treatment, intelligent nanomedicine, and immune therapy, and performs great potential,[3] radical cystectomy with urinary diversion remains the definitive treatment for muscle-invasive bladder cancer and high-risk non-muscle-invasive bladder cancer.[4]

Ureteroenteric anastomotic stricture (UAS), a well-known complication after urinary diversion, has an approximate prevalence of 3–10%. UAS can lead to severe hydronephrosis, infection, and chronic renal failure.[5] Ureteroenteric anastomotic atresia (UAA) is a more complicated condition characterized by the complete loss of the segmental ureteral lumen. Ureteroneocystostomy remains the gold-standard treatment, having a high success rate and ensuring maximal invasion of the UAS and UAA. However, secondary ureteral interventions are associated with surgical challenges and postoperative morbidities. With the development of endourological techniques for ureteral strictures, these techniques have been attempted in UAS cases to improve patient care with minimal invasion; however, a relatively low success rate was achieved.[5] No successful endourological case of UAA has been reported, and ureteroneocystostomy seems to be the only option. We have previously performed mature bypass surgery to treat patients with ureteral stricture and atresia *in situ* and achieved considerable long-term efficacy.[6]

Herein, we present an innovative endourological bypass-ureteroplasty method to establish a stable autologous channel without the need for long-term stent placement to maintain drainage of the orthotopic neobladder. This provides an alternative, novel, and promising approach for UAA.

This study was approved by the Ethics Committee of West China Hospital, Sichuan University (Approval No. 2019-009). Informed consent was obtained from all individual participants included in the study. Also, this case report follows the CARE checklist (Supplementary Materials S1).

Case report

A 65-year-old man underwent radical cystectomy and urinary diversion of orthotopic neobladder for high-risk non-muscle-invasive bladder cancer in 2019. The patient received standardized and periodic chemotherapy nine times after the operation. In the later stage of the treatment course, the patient gradually developed swelling and pain in the left lumbar region. Computed tomography (CT) revealed severe left hydronephrosis, while endoscopic examination confirmed left UAA due to loss of the left ureteral opening. Immediately, a percutaneous nephrostomy was performed to maintain long-term drainage and preserve renal function. Two years later, the patient sought progressive medical aid to improve the poor quality of life associated with the nephrostomy. Since the patient explicitly rejected the first suggestion of ureteroneocystostomy, endourological surgery was performed.

Surgical process

Unfortunately, we could not locate the exact left ureteroenteric anastomotic opening using cystoscopy.

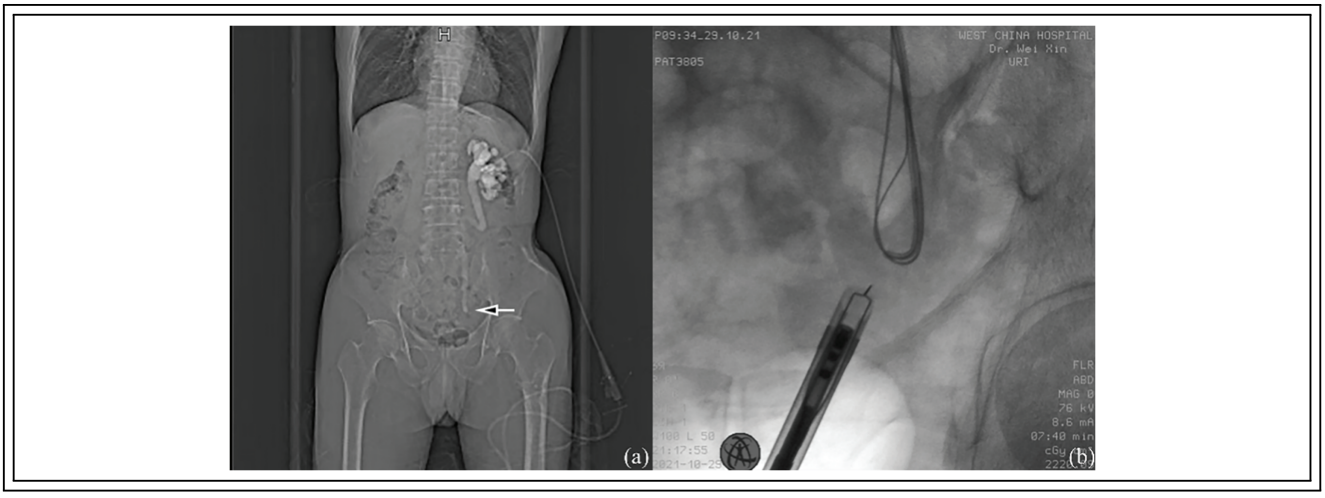

FIGURE 1. Localization of the atresia plane and site. (**a**) Antegrade pyelography was used to show the ureteropelvic profile and the level of the atresia; (**b**) A ureteral catheter (6 Fr) was inserted along with the antegrade guidewire to provide a reliable channel to adjust the tension from the guidewires

A contrast agent was injected via the antegrade channel to reveal the whole ureteropelvic profile and the level of atresia using fluoroscopy. A guidewire was then placed via the same path to the atresia region, and a ureteral catheter (6 French gauge [Fr]) was inserted along with the guidewire to provide a reliable antegrade channel (Figure 1).

Under continuous fluoroscopy guidance, we pushed the neobladder mucosa gently and observed the corresponding motion of the guidewire to estimate the location of the ureteroenteric anastomotic region. A partial-thickness plasma incision into the muscular layer of the neobladder with a needle probe was performed in the marked area under continuous fluoroscopy guidance of antegrade reaction to ensure the approach direction. By continuously applying downward tension from the antegrade guidewires, we eventually located the ureter area. A holmium laser (0.5 J and 80 Hz) under the ureteroscope was used to break the fascia until the antegrade guidewire was visible, and the ureteral segment between the incision region and the upper portion of the ureteral lumen was completely abandoned (Figure 2). By removing the guidewire, we successfully set a retrograde channel to the left kidney. Through this channel, balloon dilatation (21 Fr) was performed in the atresia segment to dilate the channel. Finally, Allium ureteral stents (24z and 12 cm) were successively inserted in the lost ureteral segment to build a temporary bypass and prevent urine leakage. The other stent was placed above the head end of the first stent to prevent displacement. Antegrade urography was performed to ensure fluent drainage and no leakage occurred (Figure 3). The nephrostomy tube was retained temporarily but closed postoperatively. The procedure lasted 147 min and was uneventful; however, abdominocentesis for operative ascites was performed before recovery from anesthesia. After suitable anti-infection intervention, the abdominal drainage tube and nephrostomy tube were removed on the second and third day after the operation, respectively. The patient was discharged with an indwelling catheter on postoperative day 7, followed by uncomplicated catheter removal after 2 weeks.

The follow-up visit was arranged once every 3 months. Few stent-related symptoms and mild hydronephrosis were detected during the follow-up period. The CT during the fifth follow-up visit revealed that the stents had unexpectedly dropped into the neobladder with no hydronephrosis. The subsequent endoscopy performed unexpectedly revealed that the previous bypass had established a stable and intact ureteral lumen with clear drainage

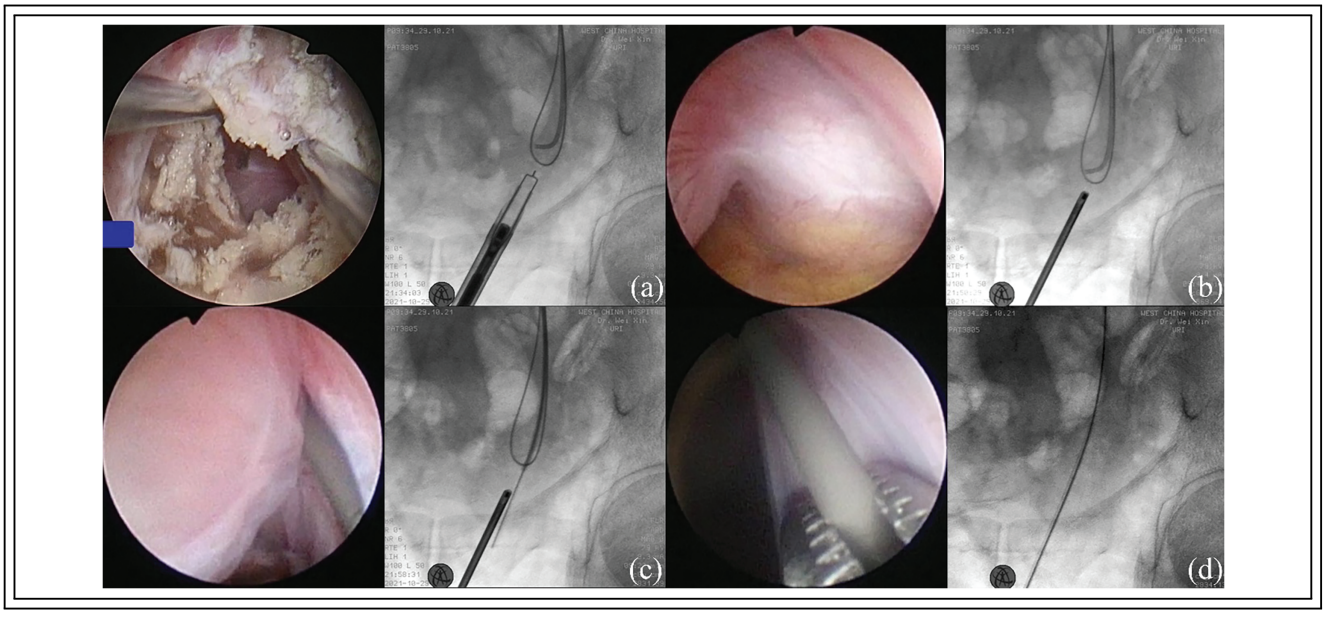

FIGURE 2. Recanalization of the occluded segment under endoscopic vision. (**a**) Plasma electroincision was performed in anastomotic area; (**b**) Locating the ureteral area out of the neobladder by dynamically changing the antegrade tension to identify the corresponding active area under the ureteroscope; (**c**) A holmium laser was used to cut local tissue to find the antegrade guidewire; (**d**) The antegrade guidewire was pulled out through the urethra to establish a retrograde operative access

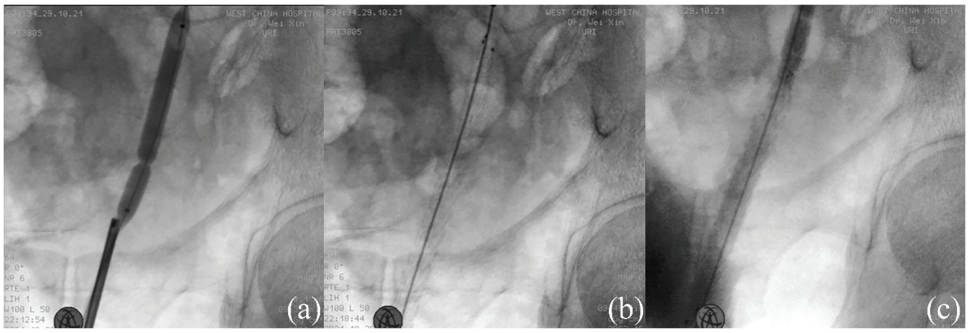

FIGURE 3. Stabilization and establishment of Bypass Channel based on Allium stent. (**a**) Balloon dilatation was used to expand the channel; (**b**) Insertion of the Allium ureteral stent to build the ureteral bypass; (**c**) Antegrade pyelography showed clear drainage and no leakage of urine

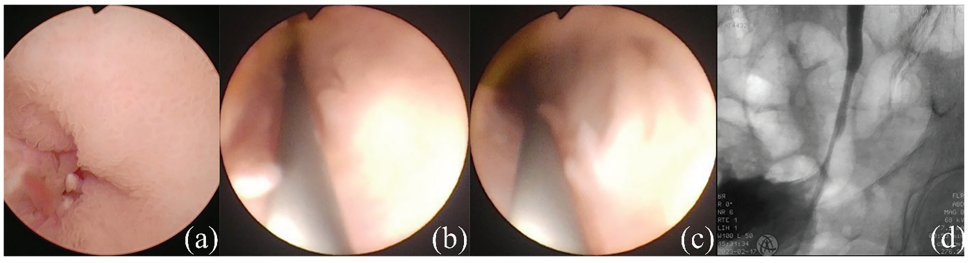

FIGURE 4. Patent autologous bypass formed after stent removal. (**a**) Opening of the autologous ureteral bypass; (**b**,**c**) An autologous ureteral bypass with intact lumen; (**d**) Clear drainage came into being after taking the Allium ureteral stents out

(Figure 4). The stents were removed, and the patient has remained symptom-free for 18 months, with few hydronephrosis detected (Figure 5).

Discussion

UAS is a common complication occurring after urinary diversion. The notable consequence is deterioration of the glomerular filtration rate, which eventually results in partial or total permanent loss of renal function without timely and effective treatment.[4] Ureteroneocystostomy is considered the gold-standard treatment for UAS and has a high success rate. Schondorf et al. reported a success rate of 91% in 35 patients after a median follow-up duration of 29 months.[7] Another study reported a success rate of 78% in 32 patients, which could be associated with previous failed endourological interventions.[8]

Furthermore, with advancements in robotics and artificial intelligence platforms, surgical robots have gained widespread application in ureteroneocystostomy surgeries, achieving better clinical outcomes and minimizing surgical trauma. However, these approaches are often challenging for surgeons because of dense adhesions after major

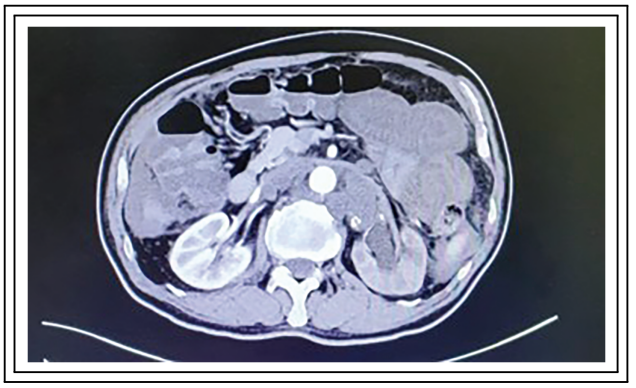

FIGURE 5. Computed tomography (CT) indicated mild hydronephrosis eighteen months after the stent removal

surgery or local fibrosis after radio-chemotherapy. Although robot-assisted laparoscopic radical cystectomy has been increasingly used to decrease surgical difficulties and morbidity, there is no evidence to verify its advantages.[9] Endourological treatment with minimal invasion, including balloon dilatation, stent insertion, and endoureterotomy, has a significantly low success rate, which is a predicament to overcome. Distinguished from the traditional ureteral double J stent, the application of a self-expandable metal stent is a feasible choice with patency rates of 41.1% and 61.7% in primary and secondary interventions, respectively. However, the migration and obstruction resulting from long-term stent placement limit its widespread use. However, as bioprinted models progress in their application to malignant urological tumors. Their potential, combining with induced pluripotent stem cells to generate bone, neural, and other tissues, offers a promising solution to this challenge.[10]

For UAA, to our knowledge, there is no report of a successful endourological case. Hence, ureteroneocystostomy seems to be the only option. We explored the potential feasibility of the endourological autologous bypass-ureteroplasty based on the application of the Allium ureteral stent, which no longer needs long-term stent placement. The Allium stent (Figure 6) is a coated metal self-expanding stent with a large caliber and strong supporting force, and its surface is covered with a biocompatible polymer to prevent tissue ingrowth and encrustation.[6] The Allium ureteral stent placement procedure initiates with endoscopic access to the ureteral orifice under fluoroscopic guidance. Following stricture dilatation (if required), the self-expanding nitinol stent is advanced across the lesion using a delivery system, with position confirmed via radiopaque markers under X-ray. Our case demonstrated the biocompatible characteristic of the stent, allowing the growth of the peripheral tissue, perhaps neobladder intestinal epithelium or ureteral urothelium tissue, along with the frame to form a new bypass instead of the lost atretic segment. The autologous bypass is a stable and stent-free technique to maintain urine drainage, which ensures a better quality of life for the patient and fewer complications. Generally, we recommend scheduling Allium stent removal or replacement prior to reaching its projected service duration of 3 years, based on the patient's urological status.

Unfortunately, we were unable to obtain sufficient biopsy specimens of the bypass for research to ensure no potential damage occurred in the patient. Notably, this procedure may lead to intraop risks such as neobladder rupture, secondary ascites, severe intraperitoneal hemorrhage, infection and urine leakage. Therefore, we recommend maintaining low-pressure irrigation during the operation and minimizing the surgical time as much as possible to reduce the degree of abdominal ascites. More cases are warranted to evaluate the effectiveness and safety of this approach.

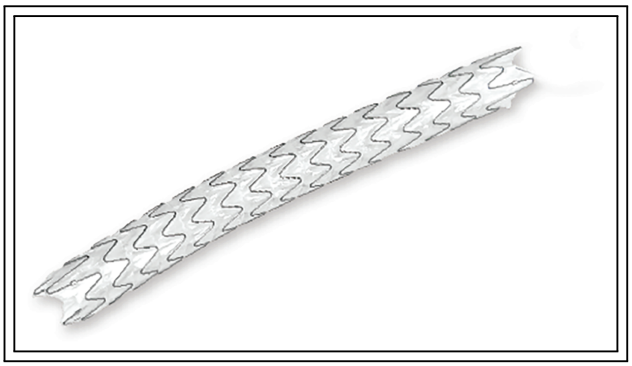

FIGURE 6. Allium ureteral stent

Conclusions

For UAS and UAA, ureteroneocystostomy remains the gold standard and reliable treatment for various complicated situations. For patients rejecting the open repairment for fear of invasion and those unsuitable for secondary open surgery, our experience provides a good choice worth trying with minimal invasiveness and fewer postoperative complications. We still need more systematic and comprehensive clinical studies to evaluate the effectiveness and safety of this novel surgical technique.

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Author Contributions

Ao Li: Writing—original draft, Visualization, Data curation. Cai Tang: Writing—original draft, Resources, Investigation. Xin Wei: Review & editing, Supervision, Project administration. Feng Liu:

Review & editing, Supervision. All authors reviewed the results and approved the final version of the manuscript.

Availability of Data and Materials

All data generated or analysed during this study are included in this published article.

Ethics Approval

This study was approved by the Ethics Committee of West China Hospital, Sichuan University (Approval No. 2019-009).

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Conflicts of Interest

The authors declare no conflicts of interest to report regarding the present study.

Supplementary Materials

The supplementary material is available online at https://www.techscience.com/doi/10.32604/cju.2025.070366/s1.

References

1. Steffens D, Koh C, Hirst N et al. Prehabilitation in patients undergoing bladder cancer surgery—A systematic review and meta-analysis. *Can J Urol* 2024;31(5):12004–12012. doi:10.1245/s10434-025-17589-y.
2. Feng DC, Li DX, Wu RC et al. Global burden and cross-country inequalities in urinary tumors from 1990 to 2021 and predicted incidence changes to 2046. *Mil Med Res* 2025;12(1):12. doi:10.1186/s40779-025-00599-y.
3. Li D, Wu R, Yu Q et al. Microbiota and urinary tumor immunity: mechanisms, therapeutic implications, and future perspectives. *Chin J Cancer Res* 2024;36(6):596–615.
4. Lobo N, Dupré S, Sahai A, Thurairaja R, Khan MS. Getting out of a tight spot: an overview of ureteroenteric anastomotic strictures. *Nat Rev Urol* 2016;13(8):447–455. doi:10.1038/nrurol.2016.104.
5. Anderson CB, Morgan TM, Kappa S et al. Ureteroenteric anastomotic strictures after radical cystectomy-does operative approach matter? *J Urol* 2013;189(2):541–547. doi:10.1016/j.juro.2012.09.034.
6. Gao X, Chen J, Wang W et al. Step-by-step technique for the endoscopic treatment of ureteric stricture. *BJU Int* 2021;128(6):692–696. doi:10.1111/bju.15558.
7. Schondorf D, Meierhans-Ruf S, Kiss B et al. Ureteroileal strictures after urinary diversion with an ileal segment-is there a place for endourological treatment at all? *J Urol* 2013;190(2):585–590. doi:10.1016/j.juro.2013.02.039.
8. Nassar OA, Alsafa ME. Experience with ureteroenteric strictures after radical cystectomy and diversion: open surgical revision. *Urology* 2011;78(2):459–465. doi:10.1016/j.urology.2011.01.040.
9. Reesink DJ, Gerritsen SL, Kelder H, van Melick HHE, Stijns PEF. Evaluation of ureteroenteric anastomotic strictures after the introduction of robot-assisted radical cystectomy with intracorporeal urinary diversion: results from a large tertiary referral center. *J Urol* 2021;205(4):1119–1125. doi:10.1097/ju.0000000000001518.
10. Wang G, Mao X, Wang W, Wang X, Li S, Wang Z. Bioprinted research models of urological malignancy. *Exploration* 2024;4(4):20230126. doi:10.1002/exp.20230126.