

## Endoscopic management of a chronic ureterocutaneous fistula using cyanoacrylic glue

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Ureterocutaneous fistula is a rare complication of renal surgery. Cyanoacrylate glue is a tissue adhesive, used primarily for the endoscopic control of bleeding from gastric varices. A female aged 33 presented to our facility with a ureterocutaneous fistula after surgery. We used a retrograde endoscopic approach for the instillation of 2 ml of sealant into the ureteral lumen to seal the ureter and fistulous tract.

The fistulous opening healed spontaneously a week after the procedure, and the patient remained dry and symptom free for 5 months following the procedure. Endoscopic delivery of cyanoacrylate sealant was a feasible and effective way in treating a ureterocutaneous fistula in our patient.

**Key Words:** ureterocutaneous fistula ◊ endoscopic management ◊ cyanoacrylate sealant ◊ minimally invasive

## CASE REPORT

A female patient aged 33 years presented to our facility with a urine leak from the left flank of an old scar overlying a swelling (Figure 1). The condition started after an eventful Cesarean Section (CS). The procedure was complicated by severe post-operative bleeding resulting in an exploratory laparotomy 48 hours after the CS. During the exploration, she had a hysterectomy for the uncontrollable uterine bleeding and also a resection and anastomosis for the small bowel perforation. Following the procedure, she endured recurrent left loin pain over a period of 6 months, but failed to seek medical advice until she went to a local hospital and had a simple left nephrectomy performed for a symptomatic, non-functioning kidney as mentioned in the postoperative specimen report. Three months later she developed left loin swelling and a urine leak from an opening on the nephrectomy scar (Figure 2); her reasons for presenting at our facility.

On the examination of this patient, we found an obese woman, who was not in painful distress. Her vital signs were stable and her body mass index was 31 kg/m<sup>2</sup>. There were midline abdominal and

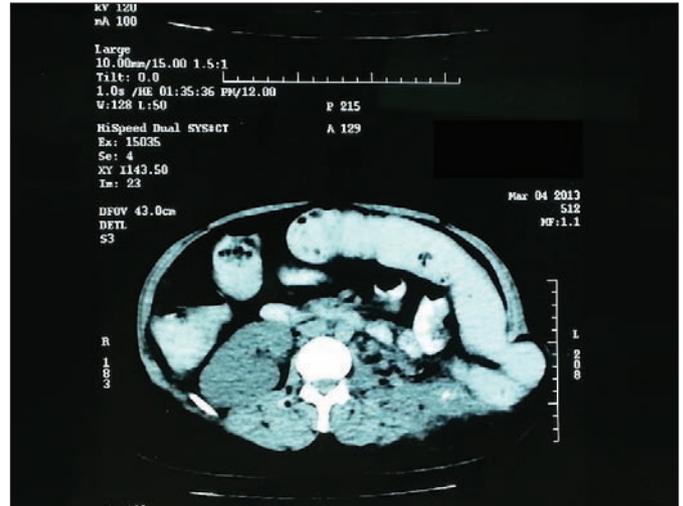
left loin scars. The loin scar overlay a reducible cystic swelling that had both a visible and palpable cough impulse. There was a fistulous opening discharging clear urine at the inferior end of the scar. No associated tenderness or foul smelling discharge was present. Other aspects of examination were within normal



**Figure 1.** A photo showing leaking ureterocutaneous fistula on endoscopic injection of saline through a ureteric catheter.



**Figure 2.** A photo showing the skin opening of the ureterocutaneous fistula.



**Figure 4.** A CT showing the left lumbar incisional hernia.



**Figure 3.** A fistulogram showing a fistula (arrow) from the scar to the ureter.

limits. A diagnosis of post nephrectomy ureterocutaneous fistula and left lumbar incisional hernia in this obese patient was made. These were confirmed by

radiological investigations (Figures 3 and 4), including a micturating cystourethrogram showing grade II left ureteral reflux. We used an open-end ureteral catheter for a retrograde endoscopic approach to the left ureter. A composite of lipidol and cyanoacrylate sealant was injected into the ureteral lumen at the level of the upper third of the ureter. The amount of adhesive injected was 2 ml (1 ml lipidol + 1 ml cyanoacrylate mixture) to seal the ureter and fistula tract. Caution to avoid early polymerization of the mixture was taken by mixing the cyanoacrylate with lipidol, followed by a rapid injection of the mixture and removal of the ureteric catheter in a period of less than 15 seconds from the start of injection. The bladder was then irrigated with saline through a 25 Fr cystoscope to prevent any accidental leak back of sealant into the bladder. The fistulous opening healed spontaneously a week after the procedure, with insignificant post-void urine residual volume detected by ultrasound and the patient remained dry and symptom free for 5 months after the procedure, until she subsequently failed to appear at any further follow-ups. Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

## DISCUSSION

A ureterocutaneous fistula is a rare complication of renal surgery [1, 2, 3]. Because of the persistent disturbing urinary leakage from the fistula, ureterocutaneous fistulas are associated with significant morbidity [4]. There is also a relative increased risk of urinary tract infection, urosepsis and skin break-

down in this group of patients. Recently, advances in instrumentation and techniques have made the approach for the management of these types of fistulas more feasible endoscopically utilizing tissue adhesives. Tissue adhesives are compounds that can be used for hemostasis, wound closure, or fistula repair. The main classes of tissue adhesives are cyanoacrylate glues, fibrin glue, and thrombin. Cyanoacrylate glues are used primarily for endoscopic control of bleeding from gastric varices and less commonly for hemostasis of other bleeding lesions. They are also used for closure of fistulae and anastomotic leaks [4].

According to published data, the standard of care for a ureterocutaneous fistula is an open or laparoscopic fistulous tract excision and omental interposition [2, 3]. This means that the standard of care is quite invasive. This may not be possible with some patients in this population because of comorbidity and problems with access. Endoscopic approaches with the use of varying types of sealants have been reported as minimum access approach either alone, or combined with percutaneous procedures for the treatment of ureterocutaneous fistula [5]. For this

particular patient we were limited by access to the fistulous tract due to previous eventful surgeries and hostile scars. Hence, we opted for an endoscopic approach using cyanoacrylate sealant. Our aim was to completely occlude the ureteral lumen as much as possible to prevent the danger of sealant regressing into the bladder, thereby increasing the risk of a vesical calculus. The primary risk of glue injection treatment of gastric varices is systemic embolization. Given the potential risks associated with the use of cyanoacrylate glue for gastric variceal treatment and preparation, we believe intra-ureteral injections do not carry the same risk, although, fibrin glue may be easier to use than cyanoacrylate glue.

The procedure was successful in closing the fistula followed with spontaneous healing of the opening on the skin a week later. The patient remained dry for 5 months after the procedure with no symptom recurrence. Endoscopic delivery of cyanoacrylate sealant is feasible and can be effective in treating a ureterocutaneous fistula in such a patient like ours.

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