

CONSERVATIVE TREATMENT OF IATROGENIC URINARY FISTULAS: THE VALUE OF CYANOACRYLIC GLUE

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ABSTRACT

Once previously attempted conservative maneuvers have failed, iatrogenic persistent urinary fistulas usually require difficult repeated operations. We describe 3 patients in whom cyanoacrylic glue was used to repair endoscopically persistent urinary fistulas occurring after major pelvic surgery. At a mean follow-up of 21 months, all patients were free of urinary leakage and had no evidence of recurrent urinary fistulas. This approach may represent a safe and effective way to repair postoperative urinary fistulas. *UROLOGY* **58**: 1046–1048, 2001. © 2001, Elsevier Science Inc.

CASE REPORTS

CASE 1

A 76-year-old man, who had already undergone suprapubic prostatectomy for benign prostatic hyperplasia some time before, underwent a Miles abdominoperineal amputation in April 1998 for recurrence of adenocarcinoma of the rectum. The postoperative course was complicated by acute urinary retention. This was treated by a urethral catheter; however, the insertion was difficult. Two days later, the catheter was removed, and the patient began complaining of urinary leakage through the perineum during micturition. Physical examination revealed a fistulous hole at the perineal wound, through which urine passed during micturition. A cystourethrogram showed a prostate-perineal fistula that was probably secondary to the incorrect urethral catheterization (Fig. 1A). Drainage with an indwelling urethral catheter for 2 months was ineffective. In May 1998, the patient underwent endoscopic application of cyanoacrylic glue, and the urethral catheter was kept in place for 48 hours. Two months after applying the cyanoacrylic glue, a cystourethrogram showed no evidence of the prostate-perineal fistula. In November 1999, the patient underwent hepatic metastasectomy of adenocarcinoma of the rectum. At a follow-up of 32 months from our procedure, the pa-

tient was disease free and asymptomatic, with no clinical evidence of any perineal fistula recurrence (Fig. 1B).

CASE 2

A 66-year-old man underwent radical cystoprostatectomy and orthotopic ileal bladder substitution in October 1998 for muscle-invasive transitional cell carcinoma of the bladder. The postoperative course after removing the urethral catheter was complicated by nausea, diarrhea, and abdominal pain. A neocystogram revealed a neobladder-ileal fistula. Drainage with an indwelling urethral catheter for 3 weeks proved ineffective. In November 1998, endoscopic application of cyanoacrylic glue was performed, followed by urinary drainage with a urethral catheter for 48 hours. At a follow-up of 26 months, the patient was disease free, with no clinical evidence of neovesical-ileal fistula recurrence.

CASE 3

A 57-year-old man underwent radical cystoprostatectomy and orthotopic ileal bladder substitution in July 2000 for muscle-invasive transitional cell carcinoma of the bladder. His postoperative course was complicated, first by a pelvic hematoma and second by urinary leakage. The pelvic hematoma was drained percutaneously. A neocystogram showed an anastomotic neobladder-urethral leakage on the left side. The urethral catheter was kept in place for 6 weeks with no results. In September 2000, endoscopic application of cyanoacrylic glue was performed (Fig. 2), and the urethral catheter was removed after 1 week because of the absence of urinary leakage through the drains. At a follow-up

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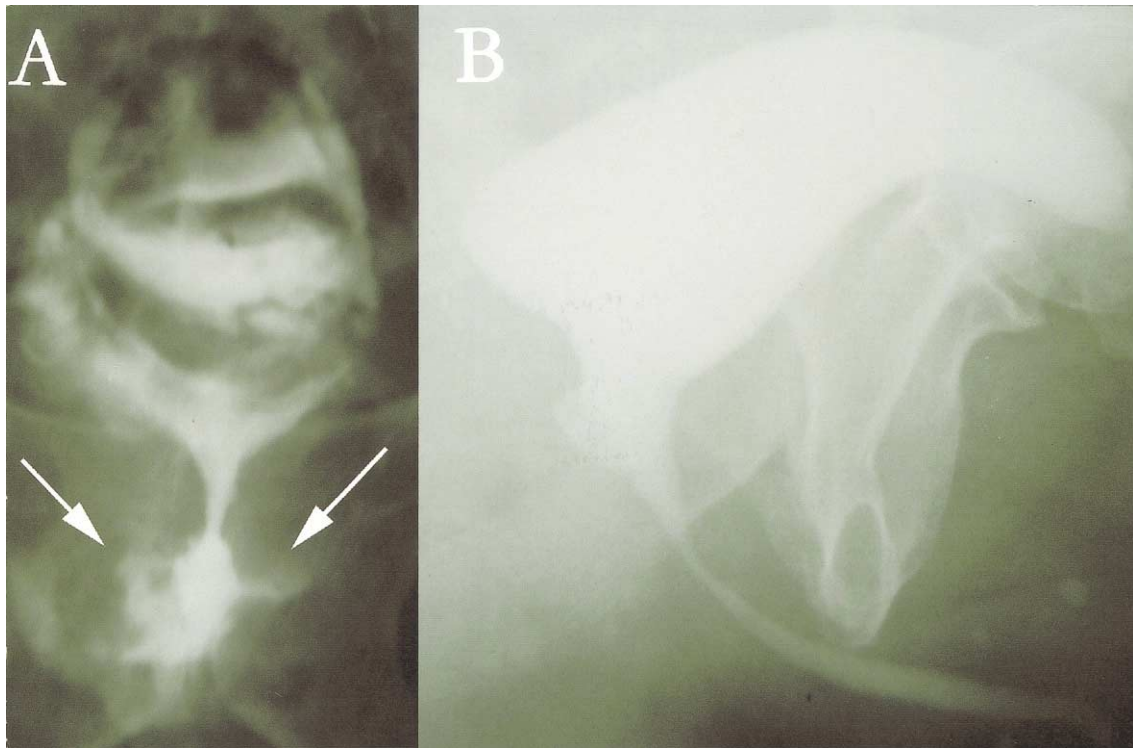


FIGURE 1. (A) Cystourethrogram showing a prostate-perineal fistula (arrows) that occurred after incorrect urethral catheterization in the postoperative course of an abdominoperineal amputation for adenocarcinoma of the rectum. (B) Two months after applying cyanoacrylic glue, the prostate-perineal fistula was no longer evident.

of 5 months, the patient was asymptomatic. An abdominal-pelvic computed tomography scan with intravenous contrast medium showed no anastomotic urinary leakage.

TECHNIQUE

Urinary fistulas are plugged endoscopically with cyanoacrylic glue. The synthetic glue is inserted endoscopically in the fistulous hole through a cystoscope, using an open-ended 6F ureteral catheter to obtain its complete obliteration.

In the first case, with the prostate-perineal fistula, it was not necessary to fill the bladder with saline. In the remaining 2 cases, the procedure was carried out with a full bladder, because the fistulas were at the neobladder. To make it easier to keep the glue in place, and taking advantage of the rapid polymerization time (which begins after 5 to 6 seconds and is completed within 60 to 90 seconds), the use of warm saline is recommended. This is because polymerization of cyanoacrylic glue is optimized at a temperature of 45°C. In our small series, preparation of the fistula to enhance the formation of granulation tissue was not performed. Two milliliters of cyanoacrylic glue is usually enough for this purpose. At the end of the procedure, a urethral catheter was inserted and left for

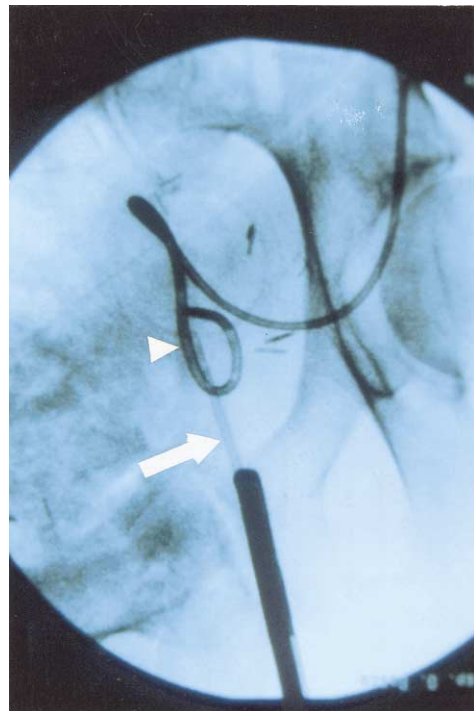


FIGURE 2. Application of cyanoacrylic glue with an open-ended ureteral 6F catheter (arrow) in the case of a urethral-pelvic urinary fistula with an infected pelvic hematoma complicating a radical cystectomy with an orthotopic Camey II ileal neobladder. A percutaneous pigtail drain of the pelvic hematoma is shown (arrowhead).

48 hours in the first 2 cases and for 1 week in the last case.

RESULTS

After excluding persistent urinary leakage, the urethral catheter was removed. No major complications were encountered during the perioperative and postoperative courses. At a mean follow-up of 21 months, all patients were free of urinary leakage, had no evidence of recurrent fistulas and/or stone formation, and no side effects had been reported. All the treated patients gave consent for this procedure and were aware of the slightly invasive nature of the procedure to avoid a possible major reoperation.

COMMENT

Cyanoacrylic glue (*N*-butyl cyanoacrylate) is a transparent synthetic liquid with high adhesive and hemostatic properties. Moreover, in a wet environment, it polymerizes rapidly and creates a thin elastic film highly resistant to stretching that is not permeable to liquids and also possesses antibacterial properties.¹

We started using cyanoacrylic glue for the endoscopic treatment of iatrogenic urinary fistulas as a conservative approach alternative to traditional surgery. Our choice was also in light of the above-mentioned characteristics and the previous encouraging results with other biologic glues reported in published studies.²⁻⁵ Our decision was also made after testing the high adhesive and hemostatic properties of cyanoacrylic glue in the prevention of prolonged lymphorrhea after extensive

pelvic and retroperitoneal lymphadenectomy and hematomas after pelvic and conservative renal surgery, with good results. Our experience has demonstrated, thanks above all to the rapid polymerization time, even in a wet environment, that it is useful for endoscopic use. A full bladder, which is necessary for optimal endoscopic vision, does not risk the correct placement and fixing of the glue. In our series, the cyanoacrylic glue successfully sealed the persistent urinary fistulas in all the treated patients. Its mechanical and biologic properties may explain its possible role in recovery. Although we only described 3 cases, we believe that our approach, in the proper setting, may represent an important contribution to the management of iatrogenic urinary fistulas, especially with regard to narrow and long tract fistulas, as a safe and effective option before proceeding to surgical treatment.

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