

Cyanoacrylate injection in management of recurrent vesicovaginal fistula: Our experience

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ABSTRACT

Treating recurrent vesicovaginal fistula (VVF) is a major clinical problem. We present a technique and special precautions taken during treatment of a small recurrent VVF with the help of combined cystoscopic and/or transvaginal injection of cyanoacrylate in two patients. Except for frequency of micturition in the first patient, postoperative follow-up was uneventful. Endoscopic management with cyanoacrylate is a simple and effective alternative to major reconstructive surgery.

Key words: Cyanoacrylate, glue, precautions of cyanoacrylate injection, recurrent vesicovaginal fistula, technique of cyanoacrylate injection

INTRODUCTION

Treatment of recurrent vesicovaginal fistula (VVF) is a major clinical problem. The most common cause of VVF in developing countries is neglected or obstructed labor. However, abdominal hysterectomy remains the most common cause of VVF in developed countries. Common approaches to VVF repair surgeries are vaginal and abdominal route. We present a technique and special precautions taken during treatment of small recurrent VVF with the help of combined cystoscopic and/or transvaginal injection of cyanoacrylate in two patients.

CASE REPORTS

Case report 1

A 47-year-old female developed VVF after abdominal hysterectomy. She had undergone an abdominal VVF repair followed by transvaginal repair for recurrent

fistula, both of which failed. She was planned for local examination and cystoscopy. On cystoscopy, there was a trigonal 4 mm single fistula present on the right side.

A disposable sclerotherapy needle was used to inject 0.5 mL N-butyl cyanoacrylate (Endocryl - Endotech, Mumbai, India) solution inside the fistula tract. Figure 1A shows sclerotherapy needle which had a protective outer sheath and a 21-gauge needle which could be popped out from the outer protective sheath with the help of handle. This sclerotherapy needle could be easily passed through 22 Fr cystoscopy sheath. The irrigating fluid was stopped during cystoscopy, and the needle was inserted through the mucosa into the fistula tract as shown in Figure 2A. A 3-way cannula was attached to the rear end of the sclerotherapy needle, and 0.5 cc of cyanoacrylate solution was injected from one end of three-way cannula and immediately flushed with 1.5–2 cc normal saline [Figure 1B] to flush out cyanoacrylate solution present in the tubing into the fistula tract. Then, the needle was reverted back inside outer protective sheath and removed from the cystoscopy sheath. For assured sealing of fistula, cyanoacrylate 0.5 cc was also injected transvaginally into the fistula with help of a long spinal needle (21-gauge) as shown in Figure 2B.

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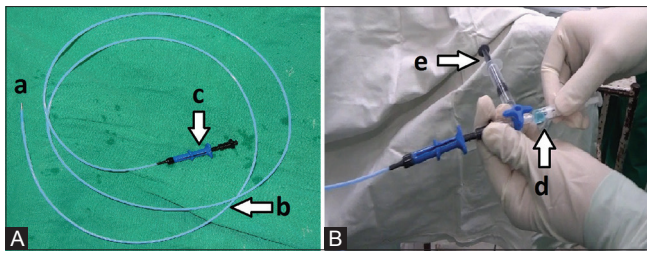


Figure 1: (A) Sclerotherapy needle (a) with outer sheath (b) and handle (c). (B) Three-way cannula attached to needle with cyanoacrylate solution (d) on one side and normal saline (e) on other side

A urethral catheter was placed for 8 days. The patient had frequency of micturition for 1 month which was managed by anticholinergics. The patient is followed up for the next 5 months without any symptoms.

Case report 2

A 50-year-old woman developed VVF after an abdominal hysterectomy. She developed recurrence after one abdominal and one vaginal repair. On cystoscopy, there was a 5 mm fistula present near the bladder neck. The small vaginal fistula opening was identified by placing a foley's catheter and injecting methylene blue inside the bladder. Transvaginally, 1 cc of cyanoacrylate was injected into the fistula tract. The urethral catheter was removed after 10 days. The cyanoacrylate had polymerized over the catheter, making removal of catheter difficult. The patient is symptom-free for 3 months.

Both patients provided informed written consent for the procedures.

DISCUSSION

Tissue adhesives are substances that polymerize on contact with tissue fluid or water. Cyanoacrylate, which is also known as "super glue," is a tissue adhesive and polymerizes once it comes in contact with tissue fluid. Epithelization occurring over the polymerized tissues is a probable mechanism of fistula closure. It is also bacteriostatic in nature. The earlier use of conventional cyanoacrylate was limited due to intense local inflammation. The most widely used synthetic formulations are N-butyl cyanoacrylate and N-octyl cyanoacrylate which cause less inflammation. N-butyl cyanoacrylate used in the closure of cystostomy in dogs had proven that it causes less inflammation than conventional suturing based on histopathological examination.^[1]

Some precautions need to be taken during injection of cyanoacrylate. The needle used for injection should be dry from inside otherwise polymerization process starts inside the needle. After instillation of solution, 1–2 cc of normal saline should be flushed immediately so that all the solution reaches the fistula tract and needle is free of the solution,

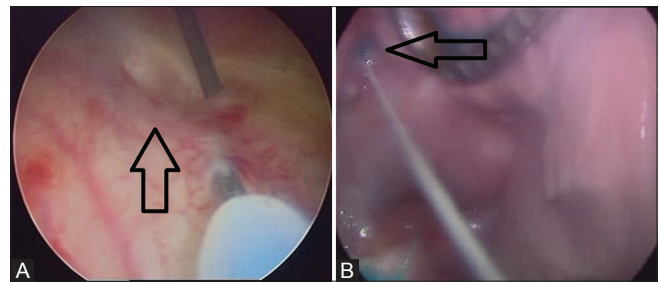


Figure 2: (A) Cystoscopy view of needle injecting cyanoacrylate into fistula tract. (B) Direct cyanoacrylate injection into fistula via transvaginal route. Fistula is marked with arrow

otherwise the needle may get blocked. While injecting cyanoacrylate solution, irrigating fluid should be stopped so that solution is not dispersed during polymerization. Care should be taken to avoid spillage of cyanoacrylate solution. Cyanoacrylate solution should be injected inside the fistula by piercing the adjacent mucosa with the needle. If the solution is injected over the fistula inside the bladder then the polymerized solution may get dispersed and success will not be achieved. Both the ureteric orifices should be visualized, and injection near ureteric orifices should be avoided. Placing a ureteric catheter before injection may aid during injection near the ureteric orifice. The needle should be adequately away from the cystoscope so as to avoid spillage of cyanoacrylate over the scope. If this occurs, the scope should be immediately withdrawn and cleaned with acetone solution. The dose should be adjusted according to the size of fistula, in general 0.5 cc of solution each from vaginal and/or cystoscopic route is adequate. Larger dose as in our second case may lead to polymerization of solution inside bladder and adhere to foley's catheter.

Schneider *et al.* compared VVF treatment via conventional method and endoscopic method with success rate of 88% in conventional open method and 66% via endoscopic method.^[2] Fibrin glue can be used as an interpositioning layer in vaginal VVF repair and is an alternative to Martius flap.^[3] Other uses of tissue sealants are control of bleeding and repair of collecting system during partial nephrectomy, as a tissue sealant during laparoscopic pyeloplasty, uretero-ureterostomy, vasovasotomy, vasoepididymostomy, etc.^[4]

The injection can be given cystoscopically as well as transvaginally. We had injected cyanoacrylate from both the sides so that it completely polymerizes inside fistula tract to decrease failure rate. In a study of 13 patients treated with cyanoacrylate solution, with median follow-up at 35 months, 11 patients could be safely managed via this approach and remaining two patients who failed with this approach had large fistula measuring more than 1 cm in width.^[5] Furthermore, the volume of injection varies from 1 to 3 cc depending on the size of fistula. Thus, endoscopic

management of fistula is best achieved when size is < 1 cm, preferably < 0.5 cm. Our both patients had recurrent VVF with attempted transabdominal and transvaginal repair where revision open surgery is technically more challenging with chances of recurrence. Hence, endoscopic management with cyanoacrylate is a simple and effective alternative to major reconstructive surgery. However, long-term study of endoscopic management as a primary therapy or in recurrent VVF taking size of fistula into account should be done.

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Conflicts of interest

There are no conflicts of interest.

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