DOUBLE GUIDEWIRE METHOD: A NOVEL TECHNIQUE FOR CORRECTION OF MIGRATED TENCKHOFF PERITONEAL DIALYSIS CATHETER

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Twenty-two consecutive patients with a continuous ambulatory peritoneal dialysis (CAPD) catheter malfunction due to catheter migration were treated with a novel radiological manipulation technique, the “double guidewire method.” The first guidewire is used to correct the direction of the catheter tip and the second wire is used to anchor the CAPD catheter so that an ideal course of the catheter can be maintained during removal of the first guidewire. Immediate catheter repositioning was achieved in 19 of 22 patients, and durable repositioning success was achieved in 13 patients.

In conclusion, the “double guidewire method” is a simple but effective technique for prolonging CAPD catheter life in patients with malfunction due to catheter migration.


KEY WORDS: Tenckhoff catheter; malposition; correction.

The Tenckhoff catheter is the most widely applied access device for continuous ambulatory peritoneal dialysis (CAPD) (1). Various techniques have been described for the placement of CAPD catheters. In order to obtain maximal drainage function, the catheter tip should be directed downward to the Douglas pouch or vesicorectal pouch (1,2). However, malfunction of the CAPD catheter may result from catheter tip migration, kinking of the catheter, pericatheter adhesions, fibrin deposition, and omentum or small bowel wrapping (1,3). Various noninvasive management techniques, including changing body position, enemas, and saline flushing, have been described; however, the success rate is only about 25% (3). If such noninvasive techniques fail, before surgical revision, fluoroscopically guided manipulations using a rigid cannula, stiff metal rod, tip-deflecting wire, or Lunderquist guidewire may be used to reposi-
irrigated with one bag of dialysate. The times required for complete infusion of the dialysate into and draining out from the peritoneum were measured. If the infusion time was about 8 to 10 minutes, and the draining out time was about 20 to 30 minutes, we considered the procedure successful. No contrast agent was used in our series. Due to risk of bowel irritation from the guidewires, prophylactic antibiotics (cephalexin monohydrate 250 mg 4 times daily) were routinely used for 3 days after the procedure. Once per week for a total of 5 or 6 weeks, all cases were followed up by telephone interview to ask the speed of effluent.

According to the classification of Moss et al. (6), immediate success was defined as function of the catheter at the end of the procedure, and durable success was defined as function of the catheter for more than 1 month.

**RESULTS**

Immediate successful correction of the migrated CAPD catheters was achieved in 19 (86%) patients.
Two of these 19 patients needed a second manipulation because of remigration of the catheters after 3 and 7 days respectively. The catheters were later removed from these 2 patients due to repeat migration. In the remaining 3 patients, correction of the malfunctioning CAPD catheter was not successful due to fixation of the catheter. Subsequent laparoscopic evaluation revealed omentum wrapping in two of these patients, and adhesion of the catheter to the surrounding bowel loops in the third patient. During follow-up, 13 patients (59%) had durable success. Four patients were lost to follow-up. None of the patients had any complications after the procedure.

DISCUSSION

CAPD is an important alternative to hemodialysis and renal transplantation in patients with end-stage renal disease. Despite the design of various new types of CAPD catheters, the Tenckhoff catheter remains the most commonly used (1). Catheter-related infection and catheter malfunction are the two most common causes of failure of peritoneal dialysis (3). Removal of the CAPD catheter is inevitable once catheter infection develops. In cases of catheter malfunction, conservative management should be tried despite the success rate of only approximately 25%. Surgical revision or laparoscopically assisted surgery may be performed if conservative treatment fails. Recently, several reports have stressed that at least one attempt at fluoroscopically guided percutaneous manipulation of the malfunctioning migrated catheter should be made before operating (1,4,9).

Many devices have been used for fluoroscopically guided percutaneous manipulation of the malfunctioning migrated catheter. However, remigration of the catheter is not infrequent, regardless of the device used for repositioning (4). These devices may also be helpful in removing intraluminal debris and/or disruption of pericatheter adhesion, and thus restoring the patency of the catheter, but they have little success when used for repositioning the migrated tip (4).

Recently, Jwo et al. reported (12) that, by using a stiff, stainless Lunderquist guidewire, repositioning of the migrated catheter could be easily achieved. However, in our experience, if only one Lunderquist guidewire is used to correct the migrated catheter, the catheter always flips backward to the original migrated position. We suppose use of a single Lunderquist guidewire poses two drawbacks. First, the migrated catheter may easily spring back to the original position when the guidewire is withdrawn. Second, the stiffness of the Lunderquist guidewire may generate abdominal discomfort or even pain during the procedure, and the potential for bowel injury cannot be completely eliminated. In order to overcome such drawbacks, we developed a new technique for repositioning a migrated catheter using two PTFE-coated, curved-tip, fixed-core guidewires. There are four distinct advantages with this technique. First, the PTFE-coated guidewire is of moderate flexibility and softness and thus is less likely to result in abdominal pain or discomfort, as noted during the procedure in this series. Second, the curved-tip design decreases the likelihood of catastrophic bowel injury. Third, compared to the stiff Lunderquist guidewire, PTFE-coated guidewires are easier to manipulate and the first guidewire can easily be buckled back into the pelvic cavity so that the migrated catheter can be redirected downward. Fourth, the second guidewire can also be inserted with ease to anchor the catheter and can be removed without backward flipping of the catheter so that remigration can be prevented. The whole procedure can be accomplished in approximately 5 minutes.

Due to this novel “double guidewire” technique, 19 of 22 patients (86%) in this series enjoyed immediate success, 59% (13/22 patients) had durable success, and none of the patients had any complication after the procedure.

In conclusion, the results of this study demonstrate that the “double guidewire method” is an easy, safe, and effective technique for correction of CAPD catheter malfunction due to catheter migration.

REFERENCES