

Tenckhoff Catheter Malfunction Corrected by Gastric Channel-Cleaning Brush without Fluoroscopy

Pisith Intarawongchot MD*

* Kidney Disease Unit, Nongkhai Hospital, Nongkhai, Thailand

Objective: To review the modified gastric channel-cleaning brush without fluoroscopy technique, which is easier, faster, and safer than the original technique for correcting catheter malfunction in Nongkhai hospital.

Material and Method: Clinical records of CAPD patients with catheter malfunction in our facility between November 1, 2009 and April 30, 2011 were reviewed.

Results: The present study included 34 patients and 36 episodes of Tenckhoff catheter malfunction. Mean age was 58.26 years, male to female ratio 14:20. Causes of ESRD include 22 diabetes mellitus, five hypertension, four renal calculi, one non-steroidal anti-inflammatory drugs used, and two unknown etiology. Mean time from Tenckhoff catheter placement to develop catheter malfunction was 2.47 months. Using the brush technique, 25 episodes were successfully corrected without any complications. Ten cases were corrected by surgical correction, of which seven were successful, and three were shifted to HD. By the way, one patient chose supportive treatment.

Conclusion: The gastric channel-cleaning brush without fluoroscopy technique should be considered for correcting Tenckhoff catheter malfunction to reduce the rate of catheter removal and keep the patients longer in CAPD therapy since it is effective and safe.

Keywords: Tenckhoff catheter malfunction, Correction, Gastric channel-cleaning brush

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In CAPD, Tenckhoff catheter malfunction (outflow or both inflow and outflow failure of PD fluid caused by blood clot, fibrin, or omentum wrap) is a major complication of catheter loss. These patients usually need surgical correction with temporary or emergency hemodialysis^(1,6).

Currently, there has not been a gold standard to correct Tenckhoff catheter malfunction. A few techniques are proposed such as laxative, adjustment position, saline irrigation, heparin locked, laparoscopic salvage of catheter⁽²⁾, double guidewire method, stiff-wire manipulation^(4,5,7), and a channel-cleaning brush under fluoroscopy⁽³⁾. The last one is expensive, requires fluoroscopy apparatus and need well-trained doctors. Moreover, all techniques mentioned yield moderate success.

In 2009, Aiming⁽⁸⁾ reported "gastric channel-cleaning brushing (GCCB)" method to correct PD catheter malfunction with success rate was up to

9/10 cases. Therefore, the authors modified and simplified this method for correcting Tenckhoff catheter malfunction by a GCCB method without fluoroscopy.

Material and Method

Descriptive retrospective study in ESRD patients on CAPD treatment by government's PD first policy treated in Nongkhai Hospital between November 1, 2009 and April 30, 2011. Tenckhoff catheter malfunction was defined as malfunction of either outflow or both inflow and outflow of PD fluid drain, after assessment with a flow test and a plain KUB film. If this malfunction of catheter cannot be corrected with forced injection of heparinized saline, saline irrigation or laxative enema, GCCB will be inserted to Tenckhoff catheter at a depth equal to the catheter length (about 60 cm. for a coiled, double-cuff catheter).

Results

The authors studied 250 ESRD patients on CAPD treatment by the government's PD first policy in Nongkhai hospital between November 1, 2009 and April 30 2011. Coil type Tenckhoff catheters were used

Correspondence to:

Intarawongchot P, Kidney Unit, Nongkhai Hospital, Nongkhai 43000, Thailand.

Phone: 042-413-456-65

E-mail: sutarut2010@hotmail.com

in all cases. Forty-one episodes of Tenckhoff catheter malfunction occurred. Five episodes responded to initial simple techniques such as laxative enema, saline flush, and irrigation, and were able to resume the therapy. However, 36 episodes (34 cases) did not respond and they were inserted by a gastric channel-cleaning brush without fluoroscope. Time from implantation date to catheter malfunction varied from one day to 30 months. Thirteen cases developed in the first 14 days, 22 cases developed within one month, three cases developed after one year (mean duration 74 days). Presentations of catheter malfunction were inflow and outflow problems 32 episodes and only outflow problems in four episodes. Causes of catheter malfunction were kinking catheters in two episodes, intraluminal clot in ten episodes, intraluminal fibrin in five episodes (one of them was associated with infected CAPD), and unclassified causes in 19 episodes.

Twenty-five of 36 episodes (69%) were corrected to normal function and three episodes were corrected malposition. All episodes had very good function until follow up at one month. Only one case had two malfunction episodes at one- and four-month. The time was used less than five minutes for insertion and brush without complication. Eleven episodes were failed by a gastric channel-cleaning brush. Only one patient wanted to stop the treatment. Ten patients were sent to consult the surgeon for replacing Tenckhoff catheter, only seven patients were successfully corrected to normal function by surgical procedure, the others were changed to hemodialysis mode.

Discussion

The author have shown that Tenckhoff catheter malfunction can be corrected by GCCB method (GCCB is a medical apparatus that is available in any hospitals and the brush can be re-used after sterilization) in about 70% of the cases. In most cases of catheter malfunction, the catheters could remain patent one month after GCCB correction. Although malposition of catheter could not be improved with this procedure, free flowing of PD fluid could be achieved in all cases.

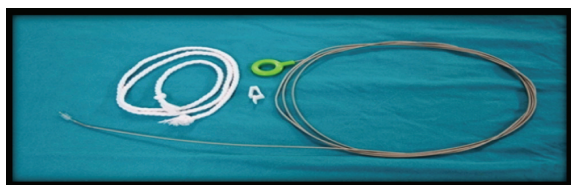


Fig. 1 Sterile rope for measurement and GCCB

Table 1. Patients characteristic

Sex	
Male:female	14:20
Age	
0-20 years	2 cases
21-40 years	3 cases
41-60 years	17 cases
> 61 years	12 cases
Causes of ESRD	
DM	22 cases
HT	5 cases
RC	4 cases
NSAIDS used	1 case
Unknown	2 cases
TK catheter placement by	
Surgeon	28 cases
Nephrologist	6 cases
Break in period 14 days	
Yes	22 cases
No	12 cases
Duration from TK catheter placement to malfunction development	
0-14 days	13 episodes
15-30days	9 episodes
31-90 days	2 episodes
91 days-1 year	7 episodes
> 1 years	3 episodes
Clinical of TK catheter malfunction	
Inflow and outflow problem	32 episodes
Outflow problem	4 episodes
Kinking catheters	2 episodes
Intraluminal clot	10 episodes
Intraluminal fibrin	5 episodes*
Unclassified causes	19 episodes

* One of them was associated with infected CAPD

Our technique was modified from the method of Aiming et al. However, the current technique needs less times to perform (5 minutes vs. 30 minutes), needs no antibiotic and heparin lock, does not require anesthesia or fluoroscopy, and has minimal complication. Therefore, it is easy, safe, and less expensive technique.

With all these advantages, GCCB method is very cost-effective for correcting Tenckhoff catheter malfunction. Since CAPD patients are common in Thailand after the “PD First Policy” was launched, GCCB method is an appropriate way to solve the problem of Tenckhoff catheter malfunction.

In conclusion, the authors proposed the GCCB method for correction of Tenckhoff catheter malfunction when other conservative attempts such

as laxative, saline irrigation, and heparinized saline flushing fail.

Potential conflicts of interest

None.

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การแก้ไขสาย Tenckhoff catheter malfunction โดยใช้ gastric channel-cleaning brush without fluoroscopy

พิสิฐ อินทรวงษ์โชติ

วัตถุประสงค์: ทบทวนผู้ป่วยในโรงพยาบาลหนองคายที่แก้ไขสาย Tenckhoff catheter malfunction โดยใช้สาย gastric channel-cleaning brush โดยไม่ต้องใช้ fluoroscopy ซึ่งทำได้ง่าย รวดเร็วไม่ยุ่งยาก และปลอดภัย.

วัสดุและวิธีการ: ศึกษาจากแฟ้มเวชระเบียนผู้ป่วย CAPD ที่เกิด Tenckhoff catheter malfunction ในโรงพยาบาลหนองคาย จากวันที่ 1 พฤศจิกายน พ.ศ. 2552 ถึง 30 เมษายน พ.ศ. 2554

ผลการศึกษา: มีผู้ป่วยที่เกิด Tenckhoff catheter malfunction 34 คน 36 episodes อายุเฉลี่ย 58.26 ปี ชายต่อหญิง 14:20 สาเหตุของ ESRD เกิดจาก diabetes mellitus 22 ราย hypertension 5 ราย renal calculi 4 ราย ใช้นยา nonsteroidal anti-inflammatory drugs 1 ราย และ unknown etiology 2 ราย ระยะเวลาเฉลี่ยจากวางสายจนเกิด catheter malfunction 2.47 เดือน แก้ไขสำเร็จโดยใช้ gastric channel-cleaning brush technique 25 episodes โดยปราศจากภาวะแทรกซ้อน รายที่ไม่สำเร็จ 7 รายต้องผ่าตัดแก้ไขสำเร็จ ส่วนอีก 3 ราย ต้อง shifted ไปทำ permanent hemodialysis เนื่องจากผ่าตัดแก้ไขไม่สำเร็จ และมีอีก 1 รายที่ขอ supportive treatment

สรุป: Gastric channel-cleaning brush without fluoroscopy technique เป็นวิธีที่ควรพิจารณาเลือกใช้ในการแก้ไขสาย Tenckhoff catheter malfunction เนื่องจากได้ผลถึงประมาณ 70% นอกจากนี้ยังทำได้ง่าย รวดเร็ว ไม่ยุ่งยาก และปลอดภัย กว่าวิธี invasive อื่น ๆ