

# EVALUATION OF TENCKHOFF CATHETER INSERTION USING OPEN SURGERY IN CHRONIC RENAL FAILURE PATIENTS

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## ABSTRACT

**Objective:** To evaluate the dysfunction rate of Tenckhoff catheter insertion for end stage renal disease patients at Sardjito General Hospital Yogyakarta. **Material & method:** Data were collected from medical record retrospectively for all chronic kidney disease (CKD) patients underwent continuous ambulatory peritoneal dialysis (CAPD), by open surgery at Sardjito General Hospital Yogyakarta, from January 2010 until Desember 2013. The cause of CKD and dysfunction rate was studied. Data was analyzed using SPSS ver 18.0 (IBM corp, USA). **Results:** There were 43 CKD patients underwent Tenckhoff catheter placement using open surgery. Tenckhoff catheter dysfunction was found in 11.7% patients. Dysfunction was caused by blockage of the catheter by omentum (6.9%) and catheter migration (4.8%). Peritonitis complication was found in 2.3% patients. The cause of CKD at Sardjito General Hospital Yogyakarta was diabetes mellitus (53.5%), hypertension (44.2%), and glomerulonephritis (2.3%). There were no correlation of dysfunction rate with gender and the cause of CKD. **Conclusion:** Tenckhoff catheter placement by open surgery at Sardjito General Hospital Yogyakarta have good outcome.

**Keywords:** Chronic kidney disease, continuous ambulatory peritoneal dialysis, Tenckhoff catheter, open surgery.

## ABSTRAK

**Tujuan:** Mengevaluasi nilai disfungsi pemasangan kateter Tenckhoff untuk pasien penyakit ginjal stadium lanjut di RSUD Dr. Sardjito Yogyakarta. **Bahan & cara:** Data dikumpulkan dari rekam medis secara retrospektif untuk semua pasien chronic kidney disease (CKD) yang menjalani continuous ambulatory peritoneal dialysis (CAPD), dengan operasi bedah terbuka di RSUD Dr. Sardjito Yogyakarta dari bulan Januari 2010 sampai Desember 2013. Penyebab CKD dan nilai disfungsi diteliti. Data dianalisa menggunakan SPSS 18. **Hasil:** Sebanyak 43 pasien CKD yang menjalani penempatan kateter Tenckhoff menggunakan operasi bedah terbuka. Disfungsi kateter Tenckhoff ditemukan pada 11.7% pasien. Disfungsi disebabkan oleh halangan kateter oleh omentum (6.9%) dan migrasi kateter (4.8%). Komplikasi peritonitis ditemukan pada 2.3% pasien. Penyebab CKD di RSUD Dr. Sardjito Yogyakarta adalah diabetes mellitus (53.5%), hipertensi (44.2%), dan glomerulonephritis (2.3%). Tidak ada hubungan nilai disfungsi dengan jenis kelamin dan penyebab CKD. **Simpulan:** Penempatan kateter Tenckhoff dengan operasi bedah terbuka di RSUD Dr. Sardjito Yogyakarta memberikan hasil yang baik.

**Kata kunci:** Penyakit ginjal kronis, continuous ambulatory peritoneal dialysis, kateter Tenckhoff, operasi bedah terbuka.

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## INTRODUCTION

Chronic kidney disease (CKD) is a damage of kidney for more than 3 months that cause the glomerular filtration rate (GFR) less than 60 mL/min/1.73 m<sup>2</sup>. About 20-25 million people in USA were diagnosed with CKD. The function of nephron will decrease if the causes of kidney damage

were not treated well. Patients with GFR less than 15 mL/min/1.73 m<sup>2</sup> will fall into end stage renal disease (ESRD).<sup>1</sup> GFR describes the velocity of the blood flow filtrated by the kidney. It can be measured by the clearance of filtration marker like inulin. The clearance method was done with constant inulin intravenous and measure the urine measurement. The other method done with measurement of inulin

in plasm or serum. Then the calculation of pharmacokinetic was done to measure the total inulin clearance.<sup>2</sup>

Substitutional therapy of choice for CKD patients are kidney transplant, hemodialysis, and peritoneal dialysis. The main one is kidney transplant. It is not only the best choice, but also increased the quality of patient's life and cost effective. Hemodialysis and peritoneal dialysis were aimed for patients who can not be transplanted.

Hemodialysis was kind of treatment done rapidly in Yogyakarta. It is done outpatiently in hospital with hemodialysis facility twice or three times a week.

Peritoneal dialysis uses the peritoneal cavum as media. Tenckhoff catheter insertion was done by using open surgery, laparoscopic, and percutaneous. This kind of dialysis can be done by the patients themselves. The other advantages are the independence of patients, visiting dialysis center periodically, no use of needle, continuous therapy, can be done at home, while going somewhere, even when the patient is sleeping.<sup>3</sup>

However, peritoneal dialysis has some disadvantages, such as Tenckhoff catheter dysfunction and peritoneal infection. The cause of dysfunction was catheter blockage by omentum and migration of the tip of the catheter. Revision was needed in this situation.

## OBJECTIVE

To evaluate the dysfunction rate of Tenckhoff catheter insertion for end stage renal disease patients at Sardjito General Hospital Yogyakarta.

## MATERIAL & METHODS

It was retrospective descriptive research aimed to evaluate the rate of Tenckhoff catheter dysfunction on patients with CKD in Sardjito General Hospital Yogyakarta. Data was collected from medical records since January 2010 to December 2013. Research population were all CKD patients treated with CAPD at Sardjito General Hospital Yogyakarta. Research subject were end stage renal disease patients underwent Tenckhoff catheter insertion at Sardjito General Hospital Yogyakarta. From the medical records of the patients with end stage renal disease underwent Tenckhoff catheter insertion using open surgery at Sardjito

General Hospital Yogyakarta, since January 2010 to December 2013, the cause of CKD and revision after insertion were evaluated. Then data was analyzed with SPSS 18 to see the rate of Tenckhoff catheter dysfunction and the cause of renal failure. Chi-square used to analyze the correlation between Tenckhoff catheter revision with gender and comorbid factors.

## RESULTS

For 4 years there were 43 patients with mean age 44.53 years old ( $\pm 18.55$ ) underwent Tenckhoff catheter insertion using open surgery at Sardjito General Hospital Yogyakarta. It consists of 33 male patients with mean age 44.15 years old ( $\pm 19.53$ ) and 10 female patients with mean age 45.80 years old ( $\pm 15.73$ ). Diabetes was the main cause (53.5%) of CKD. Then followed by hypertension (44.2%) and glomerulonephritis (2.3%) (table 1).

**Table 1.** Cause of CKD.

Diagnosis	%
Diabetes Mellitus	53.5
Hypertension	44.1
Glomerulonephritis	2.3

**Table 2.** Complication rate after Tenckhoff catheter insertion.

Type of Complication	%
Catheter dysfunction	11.7
Omental coverage	6.9
Catheter migration	4.8
Peritonitis	2.3
Infection at surgical site	-
Dialysis fluid leakage from surgical site	-
Hemoperitoneum	-

From 43 patients (table 2), there were 5 patients (11.7%) with Tenckhoff catheter dysfunction, consists of 9.3% male and 2.4% female patients. This dysfunction was caused by blockage of omentum on 3 patients (6.9%) and catheter migration on 2 patients (4.8%). Revision was done

on 4 patients, while removal on 1 patient because the patient choose hemodialysis as therapy. Another 1 (2.3%) removal was done because of peritonitis.

There was no correlation between Tenckhoff catheter revision with gender ( $p = 0.68$ ) and comorbid factors ( $p = 0.75$ ). In this research, other complications such as infection, dialysis fluid leakage from the surgical site, and haemoperitoneal were not found.

## DISCUSSION

In this research was found 5 patients (11.7%) with Tenckhoff catheter dysfunction and 1 patient (2.3%) with peritonitis. The cause of dysfunction was catheter blockage by omentum (6.9%) and catheter migration (4.8%). Tenckhoff catheter migration rate was 15% and 12% by using open surgery.<sup>4,5</sup> Tenckhoff catheter dysfunction (by open surgery) was caused by omentum blockage 8.9% and catheter migration 11.1% (table 3).

Tenckhoff catheter dysfunction can be caused by omentum blockage, catheter change of position, and obstruction. Omentum blockage can be minimized using laparoscopic, because omentum in pelvic can be stucked on abdominal wall or diminished.

Adhesion can be lysed using laparoscopic. Migration of catheter was caused by peristaltic of bowel. It causes dialysis fluid fill the peritoneal cavum but cannot be drained. The angle of Tenckhoff catheter placement in peritoneal cavum was correlated with the rate of migration.<sup>6</sup> The migration rate was increase in horizontal insertion. Migration can also be correlated with constipation, then laxative agent can be administered as primary treatment to stimulate the bowel. Other treatment for migration were manipulation with fluoroscopy, catheter reinsertion, or catheter revision. Trouble in entering flow can be caused by fibrin or blood clot in catheter. It can be handled by pushing the dialysis fluid or administering trombolytic agent.<sup>7</sup>

Infection caused by catheter could be at insertion point and peritonitis. In this research was found 1 patient (2,3%) with peritonitis. 12% peritonitis was found in catheter insertion which done using open surgery.<sup>8,9</sup> There was no surgical site infection found in this research. Infection found more than 2 weeks after insertion was not correlated with the procedure. Infection at exit point of catheter was the most often complication overall. Placing the catheter laterally or inferiorly can be done to

minimize this complication, and also antibiotic cream.

The other complication was the leakage of dialysis fluid that can be caused by movement of internal cuff or there was no fibrotic reaction on the muscle.<sup>10</sup> In this research leakage was not found. The leakage can be treated by resting the peritoneal cavum for 2 days to 3 weeks, then patient can run haemodialysis.

Bladder and bowel perforation were very rare.<sup>11-13</sup> It can be found quickly. There was no perforation found in this research.

In this research was found that the cause of CKD in Sardjito General Hospital Yogyakarta were diabetes (53.5%), hypertension (44.2%), and glomerulonephritis (2.3%). It is suitable with research done by Collins (2009), which CKD was caused by diabetes (44.4%), hypertension (26.8%), and glomerulonephritis (7.2%). There was no correlation between Tenckhoff catheter revision rate with gender and comorbid factors of CKD.

## CONCLUSION

Tenckhoff catheter placement by open surgery at Sardjito General Hospital Yogyakarta have good outcome. The cause of CKD were diabetes, hypertension, and glomerulonephritis.

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