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## Full Length Research Article

### LATE PERICATHETER LEAKAGE IN CONTINUOUS AMBULATORY PERITONEAL DIALYSIS PATIENT- A CASE REPORT

**\*Balamukunthan, K., Ram Prasad, E. and Soundararajan, P.**

Department of Nephrology, Sri Ramachandra Medical College and Research Institute, Porur, Chennai-116

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#### ABSTRACT

**Introduction:** Continuous ambulatory peritoneal dialysis (CAPD) is one of the treatment modalities for end-stage renal disease. The most important advantage of CAPD over hemodialysis is that it endows patients the liberty to perform daily activities and also is technically simpler. However, there is only limited long-term effectiveness of CAPD because of various complications. Dialysate leakage is a major noninfectious complication of peritoneal dialysis. This paper presents a peritoneal dialysis patient with late pericatheter leak.

**Case Presentation:** A 60 year old male, a known case of chronic kidney disease, basic kidney disease - Diabetic nephropathy was on peritoneal dialysis for past 2 years came with complains of abdominal pain during outflow, localized swelling over the abdomen and scrotal edema. Peritoneal fluid was cloudy and subsequent peritoneal dialysis fluid analysis showed, White blood cell count of 4000 cells with 80% neutrophils. No fungal elements were found. Fungal and bacterial cultures were negative. There was also associated pericatheter leak and peritonitis.

**Discussion:** The number of noninfectious complications in peritoneal dialysis is steadily increasing which may be due to the fall in the incidence of infectious peritonitis. The incidence of dialysate leakage is more than 5% in CAPD patients. The importance of prevention, early identification and adequate management of pericatheter leak is important because of associated patient morbidity and technique failure. Early dialysate leakage usually presents with pericatheter leakage but we present here a case of late pericatheter leakage.

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#### INTRODUCTION

Continuous ambulatory peritoneal dialysis (CAPD) is one of the treatment modalities for end-stage renal disease. The most important advantage of CAPD over hemodialysis is that it endows patients, the liberty to perform daily activities and also is technically simpler. However, there is only limited long-term effectiveness of CAPD because of various complications which can be classified into infectious and noninfectious complications based on their etiologies. Dialysate leakage is a major noninfectious complication of peritoneal dialysis.

#### Case Presentation

A 60 year old male, a known case of chronic kidney disease diagnosed in June 2011 with basic kidney disease of Diabetic

nephropathy on peritoneal dialysis (3 exchanges per day 1.5% d 4 hrs dwell) for past 2 years came with complains of abdominal pain during outflow, localized swelling over the abdomen and scrotal edema (Figure 1). Clinically patient was stable, mild fluid overload status, stable vitals. Local examination there was no purulent discharge, erythema or excoriation of skin. Peritoneal fluid was cloudy and subsequent peritoneal dialysis fluid analysis showed white blood cell count of 4000 cells with 80% neutrophils. No fungal or bacterial elements were found. Fungal and bacterial cultures were negative. CT abdomen was done which showed right iliac fossa abscess. In view of the late pericatheter leak and the CT finding of right iliac fossa abscess, the catheter was removed and patient was started on hemodialysis. Right iliac fossa abscess was drained and intravenous antibiotics were started.

#### DISCUSSION

Though there are many complications of peritoneal dialysis (Tab 1) (Brendan B. McCormick and Joanne M. Bargman,

\*Corresponding author: **Balamukunthan, K.,**  
Department of Nephrology, Sri Ramachandra Medical College and  
Research Institute, Porur, Chennai-116

2007), Dialysate leakage is a major non infectious complication of peritoneal dialysis. There is an increasing number of catheter related problems now a days, which are the major causes of technique failure and may also augment cardiovascular risk (Gokal *et al.*, 1987 and Khanna and Twardowski, 1988). Dialysate leak is defined as loss of dialysate outside peritoneal cavity through any route other than lumen of peritoneal catheter. The leak can be either by external loss or by loss within tissues. Dialysate leak can be either exit-site leak (appearance of any moisture around CAPD catheter which is identified as dialysate fluid) or dialysate loss from the peritoneal cavity excluding the lumen of the catheter. Factors which may cause dialysate leakage are related to the technique of catheter insertion, initiation of dialysis – technique and timing, and the weakness of the abdominal wall (Helfrich *et al.*, 1983 and Ash *et al.*, 1983). The incidence of peritoneal leakage ranges from 5 to 9.6 %, approximately two-thirds comprised of late leaks (Chiang *et al.*, 2014).

**Table 1. Complications of peritoneal dialysis**

Catheter related	Metabolic
Perioperative perforation of viscus or hemorrhage)	Hyperinsulinemia
Leakage (exit site or concealed)	Hypertriglyceridemia
Obstruction to flow	Hyperglycemia
Pain (on infusion or drainage)	Hyperleptinemia
Related to increased intra-abdominal pressure	Miscellaneous
Hernia	Encapsulating peritoneal sclerosis
Pleural leak (hydrothorax)	Hemoperitoneum
Back pain	



**Figure 1. Pericatheter leak with no signs of exit site leak**

Early dialysate leaks refers to the occurrence of leak within 30 days of catheter insertion and manifests clinically as external leakage while late leaks occur after 30 days of catheter insertion and usually causes leaks into tissues manifesting clinically as poor dialysate outflow, subcutaneous, peripheral or genital edema (Bennett *et al.*, 1983), hernias, ultrafiltration failure and not many cases with pericatheter leakage have been reported. Fluid leaks into thoracic cavity may also occur

leading to massive hydrothorax and pulmonary compromise (Diaz-Buxo *et al.*, 1983 and Scheldewaert *et al.*, 1982). Early leaks are mostly associated with poor catheter placement technique, with premature use of high intraperitoneal volumes and due to immediate use of CAPD after catheter insertion. Use of paramedian catheter minimizes incisional leaks. Late leaks are usually associated with mechanical tear or surgical defect in the peritoneum. In our case, late pericatheter leak, though very rare, was due to the pericatheter abscess involving right iliac fossa. Most commonly used approach to determine exact site of leakage is with the use of computed tomography which is done after infusion of 2 L of dialysis fluid which contains radiocontrast material but abdominal fluoroscopy with contrast, Peritoneal scintigraphy (Juergensen *et al.*, 1999) Peritoneal Magnetic resonance imaging with the dialysate as contrast medium (Zorzanello *et al.*, 2004) can also be used. Treatment of both early and late dialysate leak includes surgical repair, commencement of temporary hemodialysis, lowering the dialysate volumes and use of peritoneal dialysis with cycler. Recent recommendations advocate a standard approach to treatment of dialysate leaks: No CAPD for 1-2 weeks and surgery if there is a recurrence. Genital swellings have to be surgically treated.

**Prevention:** It has been recommended to delay CAPD for 14 days after the catheter is inserted and initiating CAPD with low dialysate volume to prevent dialysate leak.

## Conclusion

This paper presents a case of late dialysate leak manifesting as pericatheter leak which is very rare. This case is chosen for discussion here because of the infrequent occurrence and that they are associated with high patient morbidity and technique failure.

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