

## Blind Bedside Peritoneal Dialysis Catheter Repositioning: An Innovative Technique

### Abstract

Catheter malfunction in peritoneal dialysis (PD) patients may lead to technique failure. Surgical repositioning is sometimes required for resumption of PD and is associated with additional costs of procedure and hospitalization. Meanwhile, patients may need hemodialysis via a temporary vascular catheter with increasing costs and risk of catheter-associated bacteremia. We describe an innovative technique of blind bedside PD catheter repositioning as a possible alternative to surgical repositioning when there is catheter malfunction. In 29 patients over a period of 3 years, we attempted blind bedside PD catheter repositioning with immediate successful inflow and outflow in all of them after repositioning. At 1 month, 21 (72.4%) patients had good catheter function and at 6 months, 19 (65.5%) patients were continuing successful PD. This bedside innovative procedure allowed for catheter salvage without constructing a new exit site or tunnel and without the requirement of a break-in period. The benefits to the patient in terms of cost and shortened hospital stay make it ideal for resource-poor settings. We suggest that this innovative technique be attempted before resorting to the open surgical method of PD catheter repositioning.

**Keywords:** Catheter malfunction, innovation, peritoneal dialysis, repositioning

### Introduction

Blind bedside percutaneous peritoneal dialysis (PD) catheter insertion is the default technique of catheter insertion at our center.<sup>[1]</sup> The most common early causes of catheter malfunction<sup>[2]</sup> are malposition, omental wrapping, kinks, and presence of fibrin clots, the latter two presenting as difficulty in both inflow and outflow of PD fluid. The position of the intra-peritoneal position of the catheter tip is confirmed by plain radiograph of the abdomen and may show catheter-tip migrated. When improved bowel routine using polyethylene glycol is unsuccessful, stiff wire manipulation can be tried<sup>[3]</sup> failing which surgical repositioning is required, either laparoscopically or by mini-laparotomy, especially when there is catheter-tip malpositioning.

Surgical repositioning of their catheter is associated with increased costs of procedure and hospitalization. Anesthesia, surgical expertise, and operating room time all add to the extra out of pocket costs to the patient. While awaiting

surgical repositioning, the patient may need hemodialysis via a temporary jugular venous catheter increasing costs and with increased risk of catheter-associated bacteremia.

### Case Details

We describe here an innovative technique of blind bedside PD catheter repositioning as a possible alternative to surgical repositioning when there is catheter malfunction. Prophylactic intravenous antibiotic (vancomycin or cefazolin) is administered before the procedure. The abdomen is scrubbed and cleaned with chlorhexidine gluconate solution. The PD catheter distal to the exit site is meticulously cleaned and the titanium adaptor and transfer set are removed. The former is soaked in chlorhexidine gluconate. A guidewire is passed through the catheter into the peritoneal cavity [Figure 1]. After infiltrating the skin over the previous healed incision scar with 2% xylocaine local anaesthetic, a 5 mm incision is made over the site of the previous incision. The soft tissue is dissected until the deep cuff is visible [Figure 2]. With blunt dissection, the cuff is gently separated from

**Santosh Varughese,  
Suceena Alexander,  
Anna T. Valson,  
Anjali Mohapatra,  
Vinoi G. David,  
Shibu Jacob,  
Elenjickal E. John,  
Pradeep M. Koshy,  
Jeethu J. Eapen,  
Athul Thomas,  
Sabina Yusuf**

*Department of Nephrology,  
Christian Medical College,  
Vellore, Tamil Nadu, India*

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#### Address for correspondence:

*Dr. Santosh Varughese,  
Department of Nephrology,  
Christian Medical College,  
Vellore, Tamil Nadu - 632 004,  
India.  
E-mail: santosh@cmvvellore.  
ac.in*

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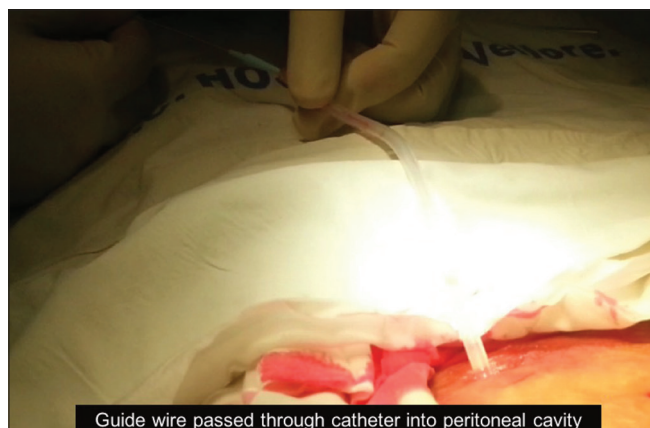


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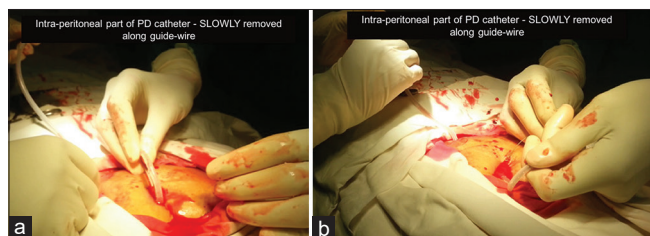
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the subcutaneous tissue where it had become anchored. Taking care to retain the guidewire's position inside the peritoneum, the intraperitoneal part of the PD catheter is gently advanced along the guidewire [Figures 3 a and b]. The external portion of the guidewire is advanced through the PD catheter until it is free from the catheter [Figure 4]. Thus, the proximal end of the guidewire is in the peritoneum and the distal end is free [Figure 5]. The PD catheter is checked for occluding clots, which are gently milked out and the catheter flushed with saline. A dilator is advanced along the guidewire to ensure adequate space for the PD catheter at the linea alba and below. The peel-away sheath and dilator assembly are then advanced into the peritoneum. The dilator and guidewire are removed leaving only the sheath in place. The intraperitoneal part of the catheter is then reintroduced into the peritoneum through the sheath, which is separated leaving the catheter in place. The peritoneal cavity is filled with PD fluid and good inflow and outflow are confirmed. The subcutaneous tissue and skin are then closed in layers. The original titanium adaptor is thoroughly rinsed with saline and reconnected to the distal end of the catheter and a new transfer set is used. PD may be resumed the same day without a break-in period.

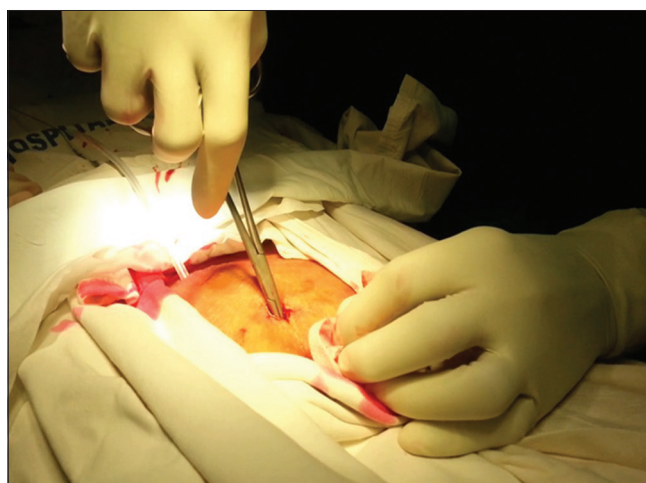


**Figure 1:** After cleaning the catheter distal to the exit site and removing titanium adaptor and transfer set, a guidewire is passed through the catheter into the peritoneal cavity



**Figure 3:** (a) The deep cuff is gently separated from the subcutaneous tissue. Taking care to retain the guidewire's position inside the peritoneum, the intraperitoneal part of the PD catheter is gently advanced along the guidewire. (b) The deep cuff is gently separated from the subcutaneous tissue. Taking care to retain the guidewire's position inside the peritoneum, the intra-peritoneal part of the PD catheter is gently advanced along the guidewire

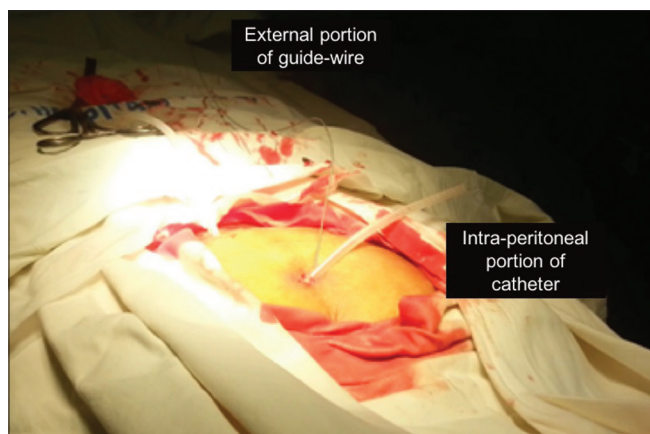
Over a period of 3 years, we attempted blind bedside PD catheter repositioning in 29 patients, aged 47.3 years (range 17 to 78), 18 of which were male. All of them had undergone blind bedside percutaneous PD catheter insertion with an ultrashort break-in period as we have described previously.<sup>[4]</sup> There was an immediate success, i.e., successful inflow and outflow in all these patients after repositioning. The X-rays taken after the procedure confirmed the pelvic location of the tip of the PD catheter. At 1 month, 21 (72.4%) patients had good catheter function. In the patients where the repositioning procedure was unsuccessful, the catheter-tip had migrated to the subhepatic space in all except one patient, in whom poor outflow was presumably due to omental wrapping. Of those who had a recurrence of catheter malfunctioning, six patients underwent surgical catheter repositioning and one preferred to do hemodialysis. At 6 months, 19 patients (65.5%) were continuing successful PD while one had a sudden cardiac death and one had a late recurrence of catheter malfunctioning and preferred to continue hemodialysis.



**Figure 2:** After infiltrating skin over previous midline incision with a local anesthetic, a 5 mm incision is made and soft tissue is dissected until deep cuff is visible



**Figure 4:** The external portion of guidewire is advanced through the PD catheter until it is free from the catheter



**Figure 5:** The proximal end of guidewire is in the peritoneal cavity and the distal end is free externally

## Discussion

The technique that we successfully used in these patients has several advantages. It is a bedside procedure that allows for catheter salvage without constructing a new exit site or tunnel and does not require a break-in period in the majority of patients. The benefits to the patient in terms of cost and shortened hospital stay make it ideal for resource-poor settings. We suggest that this innovative

technique be attempted before resorting to the open surgical method of PD catheter repositioning.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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