

Laparoscopic Peritoneal Dialysis Catheter Insertion and Its Outcome In a Cohort of Automated Peritoneal Dialysis Patients.

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Abstract

Background: Reliable peritoneal dialysis (PD) access is critical to technique survival. We describe early outcomes from a single-center series of PD catheter insertions and summarize durations and reinsertion events.

Methods: Consecutive patients undergoing PD catheter placement were analysed. The primary outcome was any catheter reinsertion or documented malfunction. Durations from index insertion to 1 September 2025 were computed. Descriptive statistics were generated.

Results: Among 21 patients (mean age 54.9±18.9 years), laparoscopic placement was used in 21 cases. Reinsertion/malfunction occurred in 4 (19.0%). Mean duration was 260.2±169.6 days; median 235 (range 10-601). Duration categories: ≤30 days: 2 (9.5%), 31 – 90 days: 2 (9.5%), 91 – 180 days: 2 (9.5%), >180 days: 15 (71.4%).

Conclusions: Laparoscopically placed PD catheter resulted in an overall successful maintenance of PD catheter short term and long term. Further long term studies are needed for a local experience in PD catheter placement laparoscopically and a comparative analysis with other techniques.

Keywords: Peritoneal dialysis; laparoscopic catheter insertion; catheter malfunction; omental wrap; technique survival; Pakistan.

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DOI: 10.53778/pjkd93318

Received Sep 9, 2025 accepted Sep 28, 2025

PJKD 2025;9(3):3-6

Introduction

Peritoneal dialysis (PD) requires reliable long-term peritoneal access. Catheter-related mechanical complications—such as omental wrap, tip migration, leakage, and obstruction—remain leading causes of early technique failure.^{1,2} Laparoscopic insertion offers direct visualization, adjunctive manoeuvres (omentopexy/omentectomy, rectus sheath tunnelling), and salvage options that may reduce dysfunction compared with open or percutaneous techniques.³ The rationale of the study was to highlight the PD catheter insertion by laparoscopic technique. The objective of the study was to assess the success rate and problems associated with laparoscopic catheter insertion among our consecutive PD patients.

Methods

We conducted a single-centre retrospective analysis of consecutive PD catheter insertions at Bahria international hospital, department of nephrology. The IRB approval of the study was obtained vide letter number IRBEC/BIH/029-2025, Dated 7th July 2025.

Laparoscopic PD Catheter Insertion

All catheters were placed by the author Dr Shahzad Ashraf. The procedure was carried out laproscopically in all cases. The entry site was determined by the surgeon himself and Medcomp coiled tip swan neck catheter PD Catheter (USA) was used for PD access. Laproscopic technique used was as described by Crabtree et al in detail.³

Patient demographics was documented. All patients' data such as age, sex, diabetes, hypertension, catheter tip side, and reinsertion events with documented reasons were abstracted from the clinical log. The primary outcome was any catheter reinsertion or documented malfunction requiring reintervention. The outcomes were measured as short term being less than 30 days and long term beyond this time.

Statistics: All data was collected in a form. SPSS (New York, USA) was used to analyze data. Catheter retention days were calculated for descriptive characterization till September 1, 2025. Categorical data are summarized as n (%); continuous data as mean $\pm$ SD and median (range).

Results

Our cohort consisted of 21 consecutive patients. Baseline characteristics are shown in table 1

Gender (Male/Female)	15/06
Age (Years)	54.9 $\pm$ 18.9
Diabetes mellitus	12
Hypertension	18
ADPKD	03
Exit site: Left	14
Exit site: Right	07

Table 1: Baseline characteristics of 21 consecutive peritoneal dialysis patients.

All patients underwent laparoscopic placement of PD catheter. Only one patient required readjustment of a displaced catheter the same night. Overall, 4 (19%) patients required removal and reinsertion of PD catheter. In one patient happened within 30 days with omental wrap, two other patients had omental wrap more than 6 months after catheter placement and fourth patient had catheter removed due to peritonitis and reinsertion after 2 weeks. The duration from catheter retention is shown in figure 1. So in all the primary patency beyond 4 weeks was 19/21 (91%). The mean duration of catheter patency was 260 $\pm$ 169.6 days.

Discussion

Our early experience demonstrates feasibility of laparoscopic PD access with acceptable mid-term durability. Reinsertion events were predominantly related to remediable mechanical issues (e.g., omental wrap/migration).

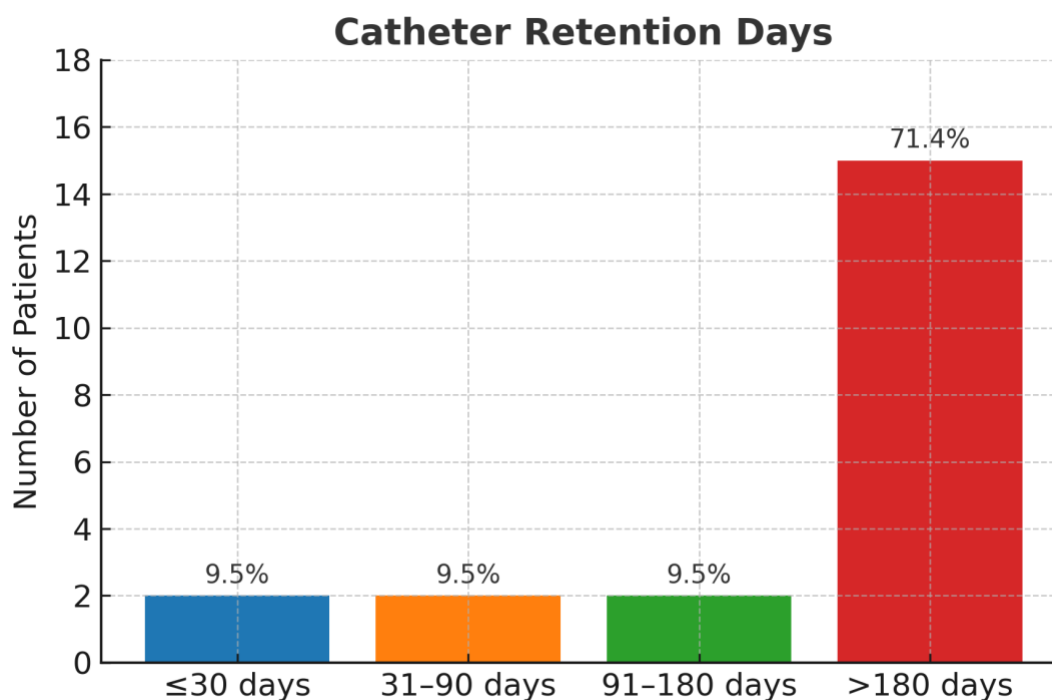


Figure 1: Duration of catheter retention among 21 peritoneal dialysis patients undergoing laparoscopic peritoneal dialysis catheter placement.

These observations align with contemporary guidelines and comparative evidence favouring laparoscopic placement of PD catheter for reduced malfunction, reoperation, and peritonitis risk in many settings.^{4,5} Standardized postoperative care (per ISPD 2023 recommendations) and proactive salvage strategies may further enhance catheter survival.^{6,7}

Three of our patients had omental wrap and required reinsertion of catheter. Laparoscopic readjustment was again done with omentopexy in all three patients. Many techniques have been described to manage the omental wrap since it is one of the major concerns in immediate post PD catheter insertion period.⁶

Limitations of our study include single-center, small sample size, and limited follow-up; these findings should be considered hypothesis-generating.

Conclusion:

The current study highlights the success rate of PD catheter placement via laparoscopic technique. Further studies are needed to evaluate the utility of pre-emptive omentopexy and comparison with other techniques such as fluoroscopic and mini laparotomy.

Conflict of interest: None declared.

Funding: None declared

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