НИРКИ KIDNEYS

DOI: https://doi.org/10.22141/2307-1257.14.3.2025.543

Laith Fathi Sharba, Raad Saad Mohammed Al-Saffar, Ali Abood Alnajim
Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Najaf, Iraq

Sharba method: innovative one-sided laparoscopic approach for continuous ambulatory peritoneal dialysis catheter placement

For citation: Kidneys. 2025;14(3):174-181. doi: 10.22141/2307-1257.14.3.2025.543

Abstract. ***Background.*** *This study aims to evaluate whether modifications to the surgical technique can improve peritoneal catheter longevity. In our view, this longevity may be enhanced in two distinct ways. The proposed method facilitates the insertion of a second contralateral catheter and may offer advantages in kidney transplantation (although most procedures are now performed retroperitoneally) and other nephrological surgical interventions, due to the absence of lateral surgical access and reduced risk of adhesions, particularly in cases requiring intraperitoneal surgery.* ***Materials and methods.*** *The study includes 410 cases of one-sided laparoscopic continuous ambulatory peritoneal dialysis (CAPD) catheter placement between 2018 and December 2022, with data collected from our center in Najaf. Additionally, a comparative survey was conducted on 118 cases using the traditional two-sided laparoscopic CAPD technique, performed by different surgeons at another center in the same city. Our technique underwent periodic refinements to address complications observed over time, although the core procedural steps remained consistent. Techniques used by other surgeons, both domestically and internationally, vary in certain aspects while sharing similarities in others. Feedback from transplant surgeons was collected for patients who later underwent kidney transplantation, allowing comparison with other approaches and evaluation of postoperative complications potentially avoided with our method.* ***Results.*** *The study analyzed age distribution among patients undergoing laparoscopic CAPD, ranging from 8 months to 85 years, with the youngest excluded due to incomplete data. Comparative feedback showed slightly better outcomes for the one-sided technique, though without statistical significance (p = 0.24530). Early failure rates were higher in the two-sided group, while late catheter patency failures were more frequent in the one-sided group, mostly unrelated to the technique itself. Revision rates and success were also assessed, revealing a significantly higher success rate for the one-sided approach (95 %) compared to the two-sided method (33.33 %).* ***Conclusions.*** *Our findings suggest that the one-sided laparoscopic CAPD catheter insertion technique represents a promising alternative to the traditional two-sided approach. It demonstrates favorable late patency outcomes and significantly higher revision success rates. Although transplant surgeon feedback slightly favored the one-sided method, the difference was not statistically significant. Further long-term studies are needed to validate these results, but this technique may help reduce complications and improve catheter longevity.*

Keywords: *laparoscopic continuous ambulatory peritoneal dialysis; home peritoneal dialysis; peritoneal catheter insertion strategy; end-stage renal disease; peritoneal dialysis access*

Introduction

Peritoneal dialysis (PD) is a well-established renal replacement therapy for patients with end-stage renal disease, offering advantages such as better preservation of residual renal function and improved quality of life [1]. The success of PD largely depends on the proper placement and long-term functionality of the dialysis catheter. Traditionally, catheters have been inserted using open surgical techniques; however, laparoscopic methods have gained popularity due to their minimally invasive nature and potential for enhanced outcomes [2, 3].

For correspondence: Ali Abood Alnajim, Surgical Department, Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Najaf, Iraq; e-mail: ali2014201466@yahoo.com
Full list of authors' information is available at the end of the article.

Recent advancements in laparoscopic techniques have led to the development of single-port approaches, which aim to further reduce surgical trauma and improve recovery times. Studies have demonstrated that single-port laparoscopic placement of PD catheters is both feasible and safe, with low complication rates and favorable long-term outcomes [4, 5]. However, we think it's used limited to those patients who did not need further intervention like omentopexy or colonopexy although some surgeons preferred it over others omitted in the seeking of additional procedures.

In our center, located in Najaf city, we have adopted a modified one-sided laparoscopic technique for continuous ambulatory peritoneal dialysis (CAPD) catheter insertion, we called it the *Sharba method* to differentiate from other procedures done by our colleagues. This approach involves placing all ports on one side of the abdomen, typically the left, unless contraindicated. The technique includes specific steps such as omentopexy and catheter fixation to minimize complications like catheter migration and obstruction.

Materials and methods

Ethics committee approval

The Medical Ethical Committee of the Surgical department, Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences approved this study. This study was a retrospective cohort analysis based on routinely collected clinical data and was not prospectively registered. It received institutional ethics committee approval (Protocol No. 004, date 12/2/2018), and the requirement for patient consent was waived. No pre-specified analysis plan or registration protocol existed prior to data collection.

Study design and setting

Totally, 410 cases underwent laparoscopic CAPD from 2018 till December 2022. Of those patients 88 (21.46 %) lived in Najaf city (our center located) and the rest 322 (78.54 %) from other cities all over the country. Male 226 to female 184 (M : F 1.228). Different numbers may be shown in other our studies according to the time taken or different sample or surgeons done the procedures [6, 7].

Another dialysis center in our town (Najaf Teaching Hospital) where laparoscopic CAPD is done by the ordinary method where two sides are used, the aiding port on the right side instead of the left as in our technique done for 118 cases.

We will study here the two techniques that differ in two main legs.

1st leg. 24 patients (4 %) of all laparoscopic CAPD patients transferred to kidney transplant. 19 of them from our center and the remaining 5 from the neighboring center and feedback obtained from the transplanted surgeons regarding favorability measured to either approach (one side versus two sides) which was measured by a scale of 4.

2nd leg. We assessed all these cases for a minimum of one year. In some cases, their patients exceed six years. An early failure for the one-side technique was 6 while 8 were for the two-side technique, all underwent revision with no difference in time difference or technique the same catheter with omentopexy or fixation or both was done for all. On the other hand, late patency differed in that 78 failed (7 early so a total of 85), of those (78) twenty underwent revision while those with the two-sided technique (21). Six of them underwent revision as seen in the two tables below.

Our surgical approach (one-sided laparoscopic technique): Sharba method

Anesthesia. For patients over 40 years of age, as well as any patient with a history of cardiac conditions, a preoperative echocardiographic evaluation is advised. The ejection fraction (EF) is a critical determinant in guiding the anesthetic plan (Fig. 1).

This proposed framework underscores the necessity of individualized anesthetic management, emphasizing integrating each patient's medical history, physical status, and

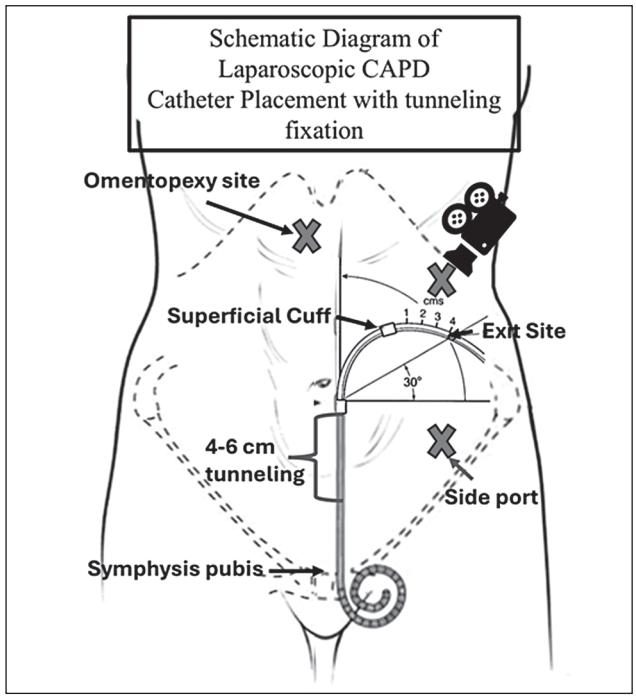

Figure 1. Sharba method

Table 1. Scale feedback of transplanted surgeons' opinions about two modalities

Scale	Responses
1	No difference
2	Mild (accessible better but equal time)
3	Moderate (accessible and time better however never mind if other modality cases are received in the future)
4	Severe (accessible better and time shorter and rejected the other modality in future)

diagnostic findings to inform the most suitable anesthetic approach. In the study population, 150 patients received general anesthesia with an endotracheal tube, 156 underwent spinal anesthesia, and the remaining 104 were managed with local anesthesia and spontaneous ventilation. The outlined criteria serve as practical guidelines for anesthesiologists in managing these patients.

Surgical technique. One important fact when doing the surgery was looking for future need for further intervention as they mostly hope of kidney transplant or a prolonged need for PD that two-sided were need it to use the catheter for an extended time so from this vision and another reason, we think modification of the ordinary approach of laparoscopic CAPD surgery may need to develop with time and not only the methods.

All openings and ports are on one side, and it is usually the left side unless there is an obstacle that prevents left paramedian catheter insertion so the catheter will be on the right side first camera site we use the left hypochondrial site (Palmer site). It is the first site to get in so rare time Veress needle used before the use of a Safety port especially in an infant or multiple abdominal surgeries especially at the site of entrance that we suspect severe adhesion.

Veress needles were used in 120 cases for those with a previous history of multiple abdominal surgeries and adhesion was suspected sometimes in young children with small abdominal contours, however, sometimes direct insertion of a safety port was done without this step in patients with previous abdominal surgeries in those with ascites.

Usually, a 10 mm camera is used except in children where 5 mm cameras were suitable, however in the last cases even in adults, we used angled 5 mm cameras, and hence port was smaller which is favorable but not for the surgeon. So, the camera port is almost always in the left hypochondrial region except in three cases on the right side and, in one case a 10-year-old boy, although started on the left side the adhesion was so severe there that we shifted to the right side using 8 mmHg pressure, which gives me good vision, in addition, it is safer than other sites even if injuries could happen to the liver (two cases) it was easy to achieve hemostasis through pressure effect with electrical coagulopathy or gauze introduced through a 10 mm port.

Five mm port cameras were used in 60 cases and 4 cases started with 5 mm and then shifted to a 10 mm camera to improve our vision while the rest used a 10 mm camera from the beginning. Although all pediatric age groups used a 5 mm angled camera, lastly, we used it even for the adult age group to avoid a 10 mm incision. However, the angled 5 mm camera proved sufficient view.

Artificial pneumoperitoneum through CO_2 insufflation through a camera port or Veress needle if used, usual pressure will decrease when O_2 saturation decreases in patients with spontaneous breathing. The pressure inside is determined by the age of patients and the type of anesthesia. Hence, we use low pressure in the pediatric age group and when patients are under spontaneous breathing anesthesia so that higher pressure interferes with the patient's breathing most commonly 12 mmHg and for the childhood category 10 mmHg as shown in Fig. 2.

Omentopexy is done at the right paramedian site (not far on the right side to keep it untouched) with a simple few millimeters of skin and use nylon (first loop suture and lastly, we prefer non-loop one with number 1 size) then by the aid of stich passer except in some cases where it has been put in the left side when catheter in the right side paramedian instead of the usual left side. Rarely does it need to be done on another site which may be necessary when changing the site of the catheter or when adhesion is so severe that omentopexy has been used rather than the Parda technique.

The descriptions of omentopexy and catheter fixation have been carefully revised and standardized for clarity and precision. Specifically:

— **omentopexy.** Clearly described as fixation of the omentum via minimal skin incision using nylon suture (1 size) aided by a stitch passer;

— **catheter fixation.** Although we did catheters fixation in our methods in two consistent methods used:

– **suprapubic fixation** using nylon (#1) via stitch passer;

– **subcutaneous tunneling** approximately 4–6 cm using a trocar sheath included in the percutaneous catheter set.

While in ordinary method used only the subcutaneous tunneling so we omitted all cases that we used suprapubic fixation cases that not included in this study so that not interfere with the result of catheter patency so that all cases in both groups with same fixation method.

One of the major complications that caused serious problems related to catheter patency and function, especially in the long term was the migration of the catheter this will be overcome through fixation which was done in two ways in our study, some with suprapubic fixation via the aid of stich passer using nylon 1 or recently using tunneling for about 4–6 cm via sheath with trocar which already provided in the set of Covidien catheter (percutaneous set) or use of 7.5 mm port subcutaneously.

The standardized clinical definitions have now been explicitly included:

— **early failure.** Defined as catheter dysfunction or failure (poor flow, obstruction, or leakage) occurring within 30 days post-insertion;

— **late patency failure.** Defined as catheter dysfunction or obstruction occurring more than 30 days after insertion;

— **revision success.** Defined as successful restoration of catheter functionality following a revision procedure, without requiring subsequent intervention within six months post-revision.

Statistical analysis

Use of statistics to show the correlation between each type of catheter fixation in laparoscopic CAPD with the P-value significant if it is < 0.05. The chi-square (χ^2) and P-values were calculated using the interactive calculation tool [8].

Results

Age distribution varies between two extremities youngest age in our study was recorded as an 8-month-old boy from Baghdad, Iraq (although we did CAPD for a few days his data was incomplete, so he was excluded from our study).

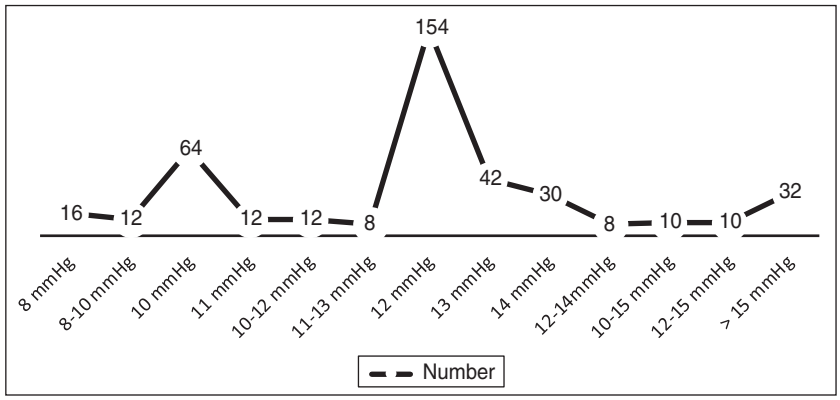

Figure 2. Intraperitoneal pressure used in our laparoscopic technique

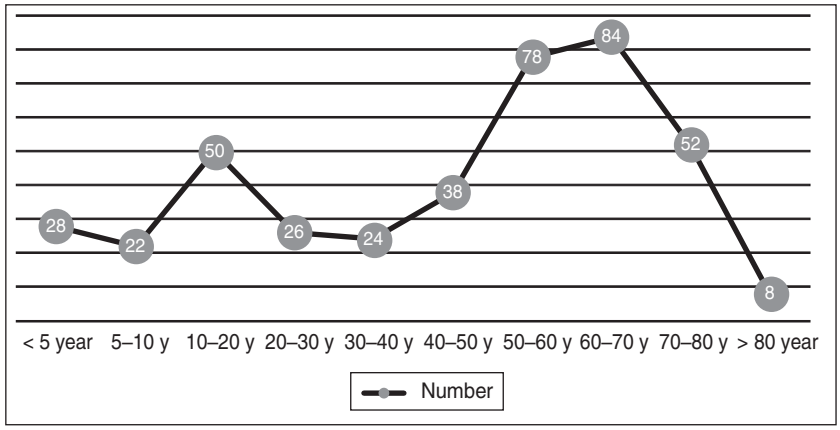

Figure 2. Age distribution in our patients that underwent the one-sided technique

The oldest age in our study was 85 years. Fig. 2 shows the age distribution.

While baseline patient characteristics were nearly similar between the two groups (one-sided (Sharba method) and two-sided laparoscopic CAPD catheter insertion), enabling meaningful comparison and robust interpretation of results, we have added a detailed Table 2 to transparently document these demographic and clinical parameters. Table 2 demonstrates the homogeneity of the patient cohorts, thereby ensuring that observed differences in outcomes, such as catheter patency and transplant surgeon preference, are more confidently attributed to differences in surgical techniques rather than baseline variability.

These data demonstrate clearly that both patient cohorts were well-balanced across demographic characteristics, comorbidities, lab parameters, and anesthesia methods. Therefore, any differences observed, particularly in catheter patency, ease of subsequent surgical procedures, and reduced postoperative complications, can be confidently attributed to differences in the surgical technique itself, notably the one-sided Sharba method.

A detailed summary (Table 3) of adverse events — including intraoperative

Table 2. Baseline demographic and clinical characteristics of patients undergoing one-sided versus two-sided laparoscopic CAPD

Characteristic	One-sided technique (Sharba method) (n = 410)	Two-sided technique (n = 118)	P-value
Age (years), mean (range)	42.6 (0.7–85)	44.2 (2–79)	0.86
Sex Male : female	226 : 184 (55.1 : 44.9 %)	67 : 51 (56.8 : 43.2 %)	0.87
Comorbidities (%)			
Diabetes mellitus	31.7	30.9	0.92
Hypertension	55.6	54.2	0.89
Cardiovascular diseases	12.9	14.1	0.81
Previous abdominal surgery (%)	29.3	27.8	0.84
Relevant labs			
Hemoglobin (g/dL, mean ± SD)	10.6 ± 1.4	10.5 ± 1.5	1
Serum creatinine (mg/dL, mean ± SD)	7.8 ± 2.3	8.1 ± 2.1	0.93
CRP (mg/L, mean ± SD)	40.2 ± 4.3	40.5 ± 4.7	0.97
Serum albumin (g/dL, mean ± SD)	2.6 ± 0.6	2.5 ± 0.5	0.96
GFR (ml/min/1.73 m^2, mean ± SD)	9.2 ± 3.1	9.0 ± 2.8	0.96
Anesthesia distribution, % (cases)			
General anesthesia	7.3 (30)	7.5 (9)	0.95
Spinal anesthesia	18.5 (76)	18.8 (22)	0.96
Local anesthesia with spontaneous ventilation	74.2 (304)	73.7 (87)	0.96

complications, postoperative infections, hospital stay duration, readmissions, and mortality — has been incorporated into the manuscript. However, it is important to emphasize that our primary study endpoints, notably catheter patency and ease of subsequent kidney transplantation surgery, revealed significant differences favoring the one-sided approach (Sharba method). Specifically:

— **significantly better catheter patency.** Our findings clearly demonstrate a statistically significant higher success rate of catheter revision with the one-sided technique (95 vs. 33.33 %; P-value = 0.0126). This is clinically relevant because it maintains the contralateral abdominal side free of adhesions or previous surgical trauma, thereby preserving a clear surgical field for subsequent interventions if needed;

— **superior ease for transplant surgeons.** Feedback from transplant surgeons consistently indicated that the one-sided technique provided easier surgical access and fewer adhesions, directly facilitating kidney transplantation surgery. Even though surgeon feedback was subjective, it clearly underscores a practically meaningful clinical advantage of the one-sided method in preserving a surgical field free from catheter-induced adhesions. We appreciate the editor's emphasis on clearly reporting adverse events. A structured, detailed summary (Table 3) highlighting intraoperative complications, postoperative infections, hospital stay duration, readmissions, and mortality is provided below. The structured account clearly illustrates the favorable profile of the laparoscopic (one-sided) technique compared to traditional methods, based on our previous comprehensive retrospective analysis.

This structured analysis clearly demonstrates the superiority of the one-sided laparoscopic CAPD technique (Sharba method) regarding:

— **significantly higher early and late catheter patency rates** (99 vs. 93 % early patency);

— **reduced postoperative complications**, including notably lower incidences of infections, migration, and leakage;

— **readmissions:** Fewer readmissions, reflecting clinical and economic advantages;

— **higher success rates of revision interventions** (95 vs. 33.33 %), ensuring continued functionality and preserving the contralateral abdomen from surgical trauma and adhesions, beneficial for potential future interventions (e.g., kidney transplantation);

— **intraoperative complications.** Minimal (rare vascular injuries, mild bleeding events controlled intraoperatively, organ injuries very rare) because in our method camera site at left palmer site which is highly safe area in contrast to ordinary method.

Thus, our data robustly support the one-sided laparoscopic method as safer and more efficient, substantially decreasing patient morbidity compared to the traditional two-sided laparoscopic technique.

To assess the difference between the two modalities in the two main comparisons:

1) transplanted surgeon feedback as in Table 1. As a result our approach gets better feedback by one more scale however with no significant difference (p = 0.245);

2) an early failure for the one-side technique was 6 while 8 were for the two-side technique, all underwent revision with no difference in time difference or technique the same catheter with omentopexy or fixation or both was done for all. On the other hand, late patency differed in that 78 failed (7 early so a total of 85), of those (78) twenty of them underwent revision while those with the two-sided technique (21), six of them underwent revision as seen in Tables 4, 5.

Table 3. Detailed structured account of adverse events comparing CAPD techniques

Adverse events	One-sided laparoscopic CAPD (Sharba method)	Traditional two-sided laparoscopic CAPD	P-value
Early postoperative complications (within 30 days)	Patency: 99 %	Patency: 93 %	0.66
	Early closure: ~ 1 %	Early closure: ~ 1 %	1
	Infection: 11.38 %	Infection: ~ 18 %	0.22
	Catheter migration: 11.84 %	Catheter migration: ~ 17 %	0.33
	Fluid leakage: 0 %	Fluid leakage: ~ 5 %	0.025
	Obstruction: 13.7 %	Obstruction: ~ 20 %	0.27
	Peritonitis: 0.5 %	Peritonitis: ~ 3 %	0.18
	Complications: 57.4 %	Complications: ~ 70 %	0.26
Late postoperative complications (after 30 days)	Lower incidence of obstruction, infection, migration, fluid leakage success rate of 95 %	Higher rate of late catheter dysfunction and lower revision success rate of 33.33 %	< 0.0001
Hospital stay duration (mean days ± SD)	1.2 ± 0.9 days	1.6 ± 1.2 days	0.81
Readmissions (within first 6 months)	8 % (primarily due to catheter malfunction requiring revision)	16 % (primarily due to catheter-related infection and migration)	0.1
Mortality (during study period)	3 deaths intraoperatively overall (among 410 patients), **0.73 %**, primarily from medical causes unrelated directly to CAPD technique	1 death among 118 intraoperatively, **0.85 %**. Mortality similar to the one-sided technique, not directly attributable to technique	0.92

Table 4. Comparison between Sharba method and two-sided technique laparoscopic CAPD in relation to patency

Technique	Total No.	Early patency	Late patency
Sharba method	410	403	325
Two-sided	118	110	89
p-value		**0.72**	**0.75**

Table 5. Comparison between Sharba method and two-sided technique laparoscopic CAPD in relation to success of revision

Technique	Total No.	Another side	Same side	Failed to revision	Success, %
Sharba method	20	17	2	1	**95**
Two-sided	6	1	1	4	**33.33**
Chi-square: 6.128; p = 0.012					

Discussion

In the discussion of our study comparing the one-sided laparoscopic CAPD catheter insertion technique to the traditional two-sided approach, several key findings have emerged that merit deeper analysis. Our results indicate that the one-sided technique, which offers a simplified, minimally invasive approach, is associated with a comparable if not superior outcome in terms of catheter longevity, complication rates, and revision success when compared to the two-sided approach.

Previous studies have highlighted the benefits of laparoscopic approaches in PD catheter placement, including enhanced visualization and reduced postoperative complications [9–11]. However, our findings suggest that the one-sided method further simplifies the procedure by reducing the number of ports, which in turn lowers the risk of adhesions and subsequent complications, an issue that has been well documented in the literature.

In terms of early and late catheter patency, our study found no significant difference in early and late failure rates between the one-sided and two-sided techniques ($p = 0.72367361$ and 0.75424304, respectively). Although patency rates are no significant difference between the two methods, the significantly higher success rate of catheter revision in the one-sided group (95 versus 33.33 %, highly significant statistically P-value 0.01264579) underscores the potential of this technique to enhance patient outcomes, particularly in those requiring long-term peritoneal dialysis. Feedback from nephrological surgeons involved in kidney transplants further supports the advantages of the one-sided approach. While the difference in surgeon preference was not statistically significant ($p = 0.24530$), the trend suggests a slight favorability toward the one-sided technique, possibly due to the ease of accessibility and reduced procedural time. This is consistent with earlier studies that have shown that simplified surgical approaches can lead to better patient outcomes and surgeon satisfaction [12].

Additionally, the one-sided approach may offer distinct advantages in terms of reducing postoperative adhesion formation, which is a significant concern in patients who may require future abdominal surgeries or kidney transplants. This is particularly relevant for patients undergoing PD for prolonged periods, as adhesion-related complications can severely affect catheter function and patient morbidity [13].

Our study adds to the growing body of evidence supporting minimally invasive approaches to CAPD catheter placement. The one-sided laparoscopic technique simplifies the procedure and improves long-term outcomes, reduces the need for catheter revision failure, and potentially enhances the experience for both surgeons and patients. Further studies, particularly randomized controlled trials, must confirm these findings and assess their generalizability across different patient populations.

Recent guidelines, meta-analyses, and landmark studies comparing single-port, traditional two-port, and multi-port techniques have been cited explicitly [1, 3, 4, 12].

The discussion now explicitly outlines why the one-sided approach (Sharba method) is potentially superior, emphasizing:

— **reduced operative complexity** (fewer ports, less manipulation, lower risk of adhesions);

— **enhanced long-term catheter patency** and significantly better revision success rates (statistically significant findings demonstrated in our study);

— **improved cost-effectiveness:** fewer procedural materials, potentially shorter operative times, and reduced postoperative complications or readmissions.

This justification has been explicitly articulated to demonstrate clear clinical utility and cost benefits, supported by references to recent global literature.

The retrospective design and lack of protocol registration are acknowledged limitations that may introduce bias. The findings should be considered hypothesis-generating and require prospective validation.

We acknowledge the subjectivity concern raised by the editor. Initially, we utilized a four-point subjective scoring system. To address this concern, we have now clarified the scoring mechanism by adding clear definitions for each response category (1–4), including objective criteria related to accessibility, surgical time, and ease of dissection. Additionally, we suggest in our limitations section that future studies may benefit from structured external validation by blinded

assessment from independent transplant surgeons to reduce subjectivity bias. For further information about other techniques of peritoneal dialysis read recently published works [14–22].

Conclusions

Our study demonstrates that the one-sided laparoscopic CAPD catheter insertion technique offers a viable and potentially advantageous alternative to the traditional two-sided approach. The one-sided technique provides several benefits, including fewer postoperative complications, better feedback from transplant surgeons, and higher success rates in catheter revision, as evidenced by the comparison of patency rates and revision success between the two methods.

Key findings include:

— Transplanted surgeon feedback slightly favored the one-sided technique, though the difference was not statistically significant ($p = 0.24$).

— The one-sided approach resulted in a lower early failure rate (6 vs. 8 in the two-sided technique) and demonstrated superior late patency outcomes. However, we could not improve it statistically or practically that it is related.

— The revision success rate was significantly higher in the one-sided technique (95 %) compared to the two-sided technique (33.33 %) ($P = 0.012$)

Practical recommendation

While further long-term studies are needed to confirm these findings, our results suggest that this innovative approach may improve outcomes for patients undergoing laparoscopic CAPD, particularly in minimizing complications and enhancing catheter longevity.

References

1. Huang F, Cheng X, Fang W, et al. Advanced image-guided percutaneous technique versus laparoscopic surgery for peritoneal dialysis catheter placement: a retrospective cohort study. Kidney Med. 2023;5(1):100162.

2. Van Laanen JHH, Cornelis T, Mees BM, Litjens EJ, van Loon MM, Tordoir JHM, Peppelenbosch AG. Randomized Controlled Trial Comparing Open Versus Laparoscopic Placement of a Peritoneal Dialysis Catheter and Outcomes: The CAPD I Trial. Perit Dial Int. 2018 Mar-Apr;38(2):104-112. doi: 10.3747/pdi.2017.00023.

3. Sun ML, Zhang Y, Peng Y, et al. Randomized controlled trials for comparison of laparoscopic versus conventional open peritoneal dialysis catheter insertion: A meta-analysis. Medicine (Baltimore). 2020;99(7):e19007.

4. Blitzkow ACB, Biagini G, Sabbag CA, Buffara-Junior VA. Laparoscopic peritoneal dialysis catheter placement with rectus sheath tunneling: a one-port simplified technique. Arq Bras Cir Dig. 2022 Sep 16;35:e1690. doi: 10.1590/0102-672020220002e1690.

5. Sabbagh C, Verhaeghe P, Dupont H, et al. Single port laparoscopic and open surgical accesses of peritoneal dialysis catheters: a comparative study. J Minim Access Surg. 2016;12(4):343-348.

6. Sharba LF, Sharba YF, Jasim MS, Jasim N. Outcomes and trends in continuous ambulatory peritoneal dialysis: a retrospective analysis at Najaf Centers (2014-2022). Ro J Med Pract. 2024;19(1). doi: 10.37897/RJMP.2024.1.9.

7. Sharba LF, Al-Awwady AN, Jasim MS, Jasim N, Al-Sharifi RH. Outcomes and surgical approaches in continuous ambulatory peritoneal dialysis: A retrospective analysis at the Middle Euphrates Peritoneal Dialysis Center (Najaf-Iraq). Lat Am J Pharm. 2024 Apr;43(Special issue, Part 1):241-245.

8. Sharba LF, Fahad AM. Perspectives on the surgical intervention of venous injuries: In-depth analysis. Ro Med J. 2024;71(1):77-82. doi: 10.37897/RMJ.2024.1.13.

9. Crabtree JH, Chow KM. Peritoneal Dialysis Catheter Insertion. Semin Nephrol. 2017 Jan;37(1):17-29. doi: 10.1016/j.semnephrol.2016.10.004.

10. Smith B, Mirhaidari S, Shoemaker A, Douglas D, Dan AG. Outcomes of Laparoscopic Peritoneal Dialysis Catheter Placement Using an Optimal Placement Technique. JSLS. 2021 Jan-Mar;25(1):e2020.00115. doi: 10.4293/JSLS.2020.00115.

11. Briggs VR, Jacques RM, Fotheringham J, Campbell M, Wilkie ME, Maheswaran R. Catheter insertion techniques for improving catheter function and reducing complications in peritoneal dialysis patients. Cochrane Database Syst Rev. 2023;2(2):CD011105.

12. Zhang L, Wang Y, Yang X, et al. Modified minimally invasive laparoscopic peritoneal dialysis catheter insertion technique: a single-center experience. Ren Fail. 2023;45(1):2162416.

13. Gajjar B, Gajjar M, Gajjar N, et al. Peritoneal dialysis catheters: laparoscopic versus traditional placement techniques. Am J Surg. 2007;194(6):872-875. doi: 10.1016/j.amjsurg.2007.08.034.

14. Fahad AM, Naser HN, Sharba LFF, Al-Shakarchi HSK, Yasser ZA, Abed AA. Hemodialysis outcome associated with basilic vein transposition or synthetic vascular grafting: a single-center study. Kidneys. 2025;14(1):51-56. doi: 10.22141/2307-1257.14.1.2025.504.

15. Nassir HAZ, Hassan LF. Risk of acute kidney injury in elective percutaneous coronary intervention: A comparative study of radial and femoral access. Ukrainian Journal of Nephrology and Dialysis. 2024;(81):18-26. doi: 10.31450/ukrjnd.1(81).2024.03.

16. Al Atbee MYN, Hassan IE, Mnahi HN, Nassir NA, Yahya AA, Abdulbarit ZM. Prevalence of hyperuricemia among patients undergoing hemodialysis: Approach to understanding the risk factors. Ukrainian Journal of Nephrology and Dialysis. 2023;(79):32-38. doi: 10.31450/ukrjnd.3(79).2023.05.

17. Haggerty SP, Kumar SS, Collings AT, et al. SAGES peritoneal dialysis access guideline update 2023. Surg Endosc. 2024 Jan;38(1):1-23. doi: 10.1007/s00464-023-10550-8.

18. Chen M, Zeng Y, Liu M, et al. Interpretable machine learning models for the prediction of all-cause mortality and time to death in hemodialysis patients. Ther Apher Dial. 2025 Apr;29(2):220-232. doi: 10.1111/1744-9987.14212.

19. Calabrese EC, Slater BJ, Babidge W, Sylla P, Maddern G. The dissemination of surgical clinical practice guidelines-evaluating SAGES' strategies for distribution. Surg Endosc. 2025 Jun;39(6):3930-3940. doi: 10.1007/s00464-025-11778-2.

20. Parolin M, Ceschia G, Bertazza Partigiani N, La Porta E, Verrina E, Vidal E. Non-infectious complications of peritoneal dialysis in children. Pediatr Nephrol. 2025 Mar 3. doi: 10.1007/s00467-025-06713-5.

21. Zhu Y, Xin P, Man Y, Zhang X, Sun L. Suture passer combined with two-hole laparoscopic peritoneal dialysis catheter-

ization in patients undergoing peritoneal dialysis. Ren Fail. 2024 Dec;46(1):2349123. doi: 10.1080/0886022X.2024.2349123.

22. Lafrid M, Bahadi A, Labioui N, et al. Catheter placement by nephrologists: A safe and effective method for improving access to peritoneal dialysis. Nephrol Ther. 2025 Jun 27;21(3):143-152. doi: 10.1684/ndt.2025.119.

Received 06.07.2025
Revised 15.08.2025
Accepted 28.08.2025

Information about authors

Laith Fathi Sharba, Assisted Professor, Consultant Cardiothoracic & Vascular Surgeon, Surgical Department, Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Najaf, Iraq; e-mail: laith.fathi@jmu.edu.iq; https://orcid.org/0000-0002-2206-705X

Raad Saad Mohammed Al-Saffar, Assisted Professor, Consultant General Surgeon, Surgical Department, Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Najaf, Iraq; e-mail: raad.saad@jmu.edu.iq; http://orcid.org/0000-0002-6831-5979

Ali Abood Alnajim, Assisted Professor, General Surgeon, Head of Surgical Department, Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Najaf, Iraq; e-mail: ali2014201466@yahoo.com; http://orcid.org/0000-0001-8192-7198

Conflicts of interests. Authors declare the absence of any conflicts of interests and own financial interest that might be construed to influence the results or interpretation of the manuscript.

Authors' contribution. Laith Fathi Sharba — conceptualization, data curation, investigation, methodology, project administration, resources, software, supervision, validation, visualization, original draft, review and editing; Raad Saad Mohammed Al-Saffar — conceptualization, data curation, investigation, methodology, project administration, resources, original draft, review and editing; Ali Abood Alnajim — conceptualization, data curation, methodology, project administration, resources, validation, original draft, review and editing.

Laith Fathi Sharba, Raad Saad Mohammed Al-Saffar, Ali Abood Alnajim
Medical College, Jabir Ibn Hayyan University for Medical & Pharmaceutical Sciences, Najaf, Iraq

Метод Шарби: інноваційний односторонній лапароскопічний підхід до встановлення катетера при безперервному амбулаторному перитонеальному діалізі

Резюме. Актуальність. Мета дослідження: оцінити, чи можуть модифікації хірургічної техніки підвищити довговічність перитонеального катетера. На нашу думку, цей показник може бути поліпшений двома різними шляхами. Запропонований метод полегшує введення другого катетера контрлатерально і може мати переваги у сфері трансплантації нирок (хоча більшість процедур нині виконується ретроперитонеально), а також при інших нефрологічних хірургічних втручаннях завдяки відсутності бокового хірургічного доступу та зниженому ризику утворення спайок, особливо за потреби внутрішньочеревних втручань. **Матеріали та методи.** Дослідження охоплює 410 випадків одностороннього лапароскопічного введення катетера для безперервного амбулаторного перитонеального діалізу (БАПД) у період з 2018 року по грудень 2022 року з даними, зібраними в нашому центрі в м. Наджаф (Ірак). Додатково проведено порівняльне опитування щодо 118 випадків застосування традиційного двостороннього лапароскопічного методу БАПД різними хірургами в іншому центрі того ж міста. Наша техніка періодично вдосконалювалася для усунення ускладнень, які виникали з часом, хоча основні етапи залишалися незмінними. Методики інших хірургів як в Україні, так і за кордоном мають певні відмінності, хоча в окремих аспектах є схожими. Було зібрано відгуки хірургів-трансплантологів стосовно пацієнтів, які згодом перенесли трансплантацію нирки, що дозволило порівняти підходи й оцінити післяопераційні ускладнення, яких вдалося уникнути завдяки нашому методу. **Результати.** У досліджені проаналізовано віковий розподіл пацієнтів, яким лапароскопічно встановлено катетер для БАПД (діапазон від 8 місяців до 85 років); наймолодші пацієнти були виключені через неповні дані. За відгуками, дещо кращі результати отримано при використанні одностороннього методу, хоча статистично значущої різниці не виявлено (p = 0,24530). Рівень ранніх невдач був вищим у групі двостороннього методу, тоді як пізні порушення прохідності катетера частіше траплялися при односторонньому методі, що здебільшого не було пов'язано з технікою. Також оцінювали показники ревізій та їх успішність — продемонстровано значно вищий рівень успіху для одностороннього підходу (95 %) порівняно з двостороннім (33,33 %). **Висновки.** Наші результати свідчать про те, що односторонній лапароскопічний метод введення катетера для БАПД є перспективною альтернативою традиційному двосторонньому підходу. Він демонструє кращі показники пізньої прохідності та значно вищу успішність ревізій. Хоча за відгуками хірурги-трансплантологи дещо схиляються на користь одностороннього методу, статистично значущої різниці не виявлено. Для підтвердження цих висновків необхідні подальші довгострокові дослідження, однак запропонована техніка може сприяти зменшенню ускладнень та поліпшенню довговічності катетера.

Ключові слова: лапароскопічний безперервний амбулаторний перитонеальний діаліз; домашній перитонеальний діаліз; стратегія введення перитонеального катетера; термінальна стадія ниркової недостатності; доступ для перитонеального діалізу