

# Laparoscopic placement of peritoneal dialysis catheter



## - technique and results of a novel method

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Peritoneal dialysis catheters according to Tenckhoff oder Oreopoulos-Zellermann are traditionally implanted by a trans-rectal laparotomy. Laparoscopy offers not only minimally-invasive catheter implantation, but also inspection of the peritoneal space with the option to correct intraperitoneal pathology minimally invasively

### Patients

In 80 patients (39 female, 41 male, Alter  $45 \pm 21$  [5-63] years, BMI  $28,5 \pm 5,1$  [22,2-35,1]) 10 Tenckhoff catheters and 70 Oreopoulos-Zellermann-catheters were placed using the newly described method.

### Method

After intubation narcosis, a 10 mm port is inserted after right transrectal mini-laparotomy, a pneumoperitoneum is created and a 12 mm suprapubic port is inserted under laparoscopic vision. Then, after left supraumbilical stab incision, the left rectal sheath is tunneled under laparoscopic vision with a newly developed pull-through instrument (Fig. 1). The peritoneum is then perforated with the instrument at the level of the arcuate line and the instrument is pushed intraperitoneally and then lead out of the abdomen through the suprapubic port (Fig. 2a-2e).

The detachable tip of the instrument is screwed off and the oral end of the peritoneal catheter is connected with the instrument (Fig. 1a, 1c+2d). Now, the pull-through instrument with the connected catheter are pulled into the peritoneum (Fig. 2e-g), and the oral part of the catheter is then pulled retrogradely through the rectal sheath out of the abdomen.

### Results

There were no intraoperative complications. The average procedure vtime was  $25 \pm 12$  [15-45] minutes. Adhesiolysis was performed in 12 cases, a Spiegelhelia hernia was corrected in one case. Indirect hernias were closed by simple sutures of the inner inguinal ring in 5 cases.

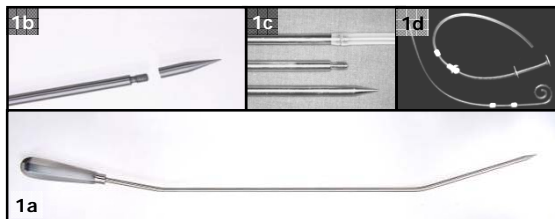


Fig. 1a-c : Pull-through instrument (Item number 30160 PD, Karl Storz Endoskope, Tuttlingen) with 5 mm diameter and detachable tip (Fig. 1b). After screwing off the tip, the catheter is connected and fixed with a ligature. (Fig. 1c). The instrument fits to any type of PD-Catheter. (Fig. 1d)

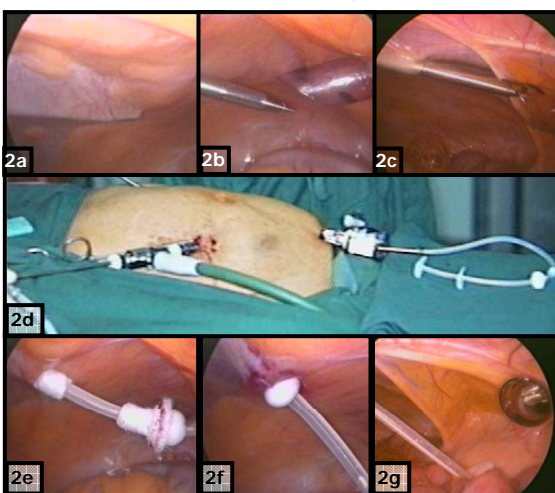


Fig. 2a - g : The pull-through instrument is lead transrectally along the left posterior rectal sheath (2a) into the left lower abdomen, where the peritoneum is perforated (2b) and pushed out of the abdomen through the suprapubic port (2c+2d). The oral end of the catheter is connected to the instrument (2d+1c) which is then pulled through the port into the peritoneum (2e). The felt-ring (Tenckhoff-catheter) or the felt-ring with silicone-olive (Oreopoulos-Zellermann-catheter) are placed epiperitoneally (2f) and the end of the catheter is placed into the Douglas-space (2g).

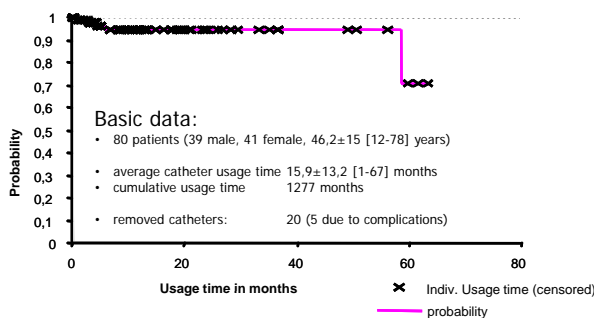


Fig. 3: Kumulative störungsfreie Funktionswahrscheinlichkeit (Kaplan-Meier-Methode) n. laparoskopischer CAPD-catheterimplantation.

Postoperatively, 2 catheter leakages and 1 epigastric vessel bleeding were noticed, both being treated conservatively. There were no more leakages, after introducing the measure to apply the first dialysis not before 5 days after catheter implantation.

15 catheters were explanted after successful renal transplantation. Catheter infections or exit site infections lead to catheter explantations in 5 patients.

All catheters are working free of complications with a cumulative usage time of 1277 ( $15,9 \pm 13,2$  [1-67]) months.

### Discussion

A safe and reliable access to the peritoneal space is mandatory and of specific significance for peritoneal dialysis patients. In many patients under chronic ambulatory periteal dialysis (CAPD), this access has to be used for many years.

Our newly developed method with the pull-through-tool allows safe and quick placement of any type of peritoneal catheter, which is the major difference to other methods of laparoscopic peritoneal catheter placement.

The low rates of leakage, exit site- and tunnelinfections are due to the long cranked tunnel through the rectal sheath with no contact of the catheter to the skin during implantation.

Another very significant advantage is the gain in diagnostic information on intraabdominal pathologies with potential minimally invasive therapy.

### Conclusion:

This newly developed method of minimally invasive peritoneal dialysis implantation catheters allows quick and safe intraperitoneal placement of any type of PD-catheter with the additional option to recognize and correct intraperitoneal pathologies. Functional results are excellent.