

Previous abdominal surgery is not necessarily a contraindication for peritoneal dialysis

Original article Chen S-Y *et al.* (2007) Does previous abdominal surgery increase postoperative complication rates in continuous ambulatory peritoneal dialysis? *Perit Dial Int* 27: 557–559

SYNOPSIS

KEYWORDS abdominal surgery, catheter malfunction, complications, continuous ambulatory peritoneal dialysis, peritonitis

BACKGROUND

Adhesions resulting from previous abdominal surgery can cause migration, kinking and obstruction of catheters in patients initiating continuous ambulatory peritoneal dialysis (CAPD). These complications can lead to malfunction of the catheter, which prolongs hospital stay and increases health-care costs.

OBJECTIVE

To compare the rates of complications following CAPD catheter insertion in patients who have previously undergone abdominal surgery and those who have not.

DESIGN AND INTERVENTION

The outcomes of all patients with end-stage renal disease who underwent catheter insertion for CAPD at the Tri-Service General Hospital in Taipei, Taiwan, during the period January 1999 to November 2004 were retrospectively reviewed. Previous catheterization for CAPD was an exclusion criterion. A single experienced surgeon carried out all catheter insertions using an open technique, via a low midline incision; patients received parenteral sedation and local anesthesia before the procedure. Follow-up continued for a minimum of 2 years. Postoperative complication rates were compared in the patients with a history of abdominal surgery and those without a history of abdominal surgery, using the χ^2 test.

OUTCOME MEASURES

The end points were rates of catheter malfunction (defined as peritoneal dialysis failure caused by catheter blockage, malpositioning of the catheter or leakage of dialysate during dialysis) and CAPD-related peritonitis.

RESULTS

The 122 patients included in this review (67 females; 55 males) were aged 21–80 years. Dialysis was initiated the day after catheter insertion in most patients. A history of abdominal surgery was noted in 18 patients (14.8%); the procedures comprised appendectomy ($n=10$), cholecystectomy ($n=4$), left hemicolectomy ($n=3$) and subtotal gastrectomy ($n=1$). Patients who had undergone previous abdominal surgery were of a similar age to those who had not (mean \pm SD 51.2 \pm 16.7 years vs 49.4 \pm 14.5 years; P = nonsignificant). Mean operation duration was significantly longer in the group that had a history of abdominal surgery than in the group that did not (84.8 \pm 20.1 min vs 65.2 \pm 17.7 min; $P < 0.05$), but neither the rate of catheter malfunction nor the rate of CAPD-related peritonitis differed significantly between the groups (16.7% vs 12.5% [3/18 patients vs 13/104 patients], and 33.3% vs 28.8% [6/18 patients vs 30/104 patients], respectively). The overall rates of catheter malfunction and CAPD-related peritonitis were 13.1% (16/122) and 29.5% (36/122), respectively.

CONCLUSION

Previous abdominal surgery does not seem to significantly increase the incidence of postoperative complications in patients who undergo insertion of a CAPD catheter.

COMMENTARY

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For patients who require peritoneal dialysis, any previous surgery involving violation of the peritoneal cavity has two potential adverse consequences: adhesions, and peritoneal boundary defects (e.g. incisional hernia). Peritoneal adhesions form after 70–90% of abdominal operations;¹ the extent of adhesion formation is unpredictable and varies greatly between individuals. Catheter insertion for dialysis can become complicated if the site of peritoneal entry coincides with an adhesive scar. Compartmentalization of the peritoneal cavity caused by adhesions can impede insertion of the catheter, produce kinking or malpositioning of the tubing, cause blockage of the side drainage holes resulting in flow dysfunction, or limit communication between the dialyzed compartment and the remainder of the peritoneal cavity. Even if the catheter is placed successfully, dialysis dosing can be inadequate if adhesions reduce the effective peritoneal surface area or if scarring compromises peritoneal transport.

Incisional hernia is a frequent complication of abdominal surgery, with a reported incidence of 2–20%. Dialysis in the presence of this defect can cause pain, dialysate leakage, intestinal obstruction, and inadequate dialysis dosing. The need for simultaneous repair of hernias during catheter insertion, or for delayed repair of occult hernias that manifest after initiating dialysis, can complicate implantation or the postimplantation period.

The incidence of previous abdominal surgery in the patient population studied by Chen and colleagues (14.8%) is considerably lower than that observed by others (45.8–55.1%),^{2–4} indicating possible bias in their selection of patients for peritoneal dialysis. Moreover, this small number of individuals in the previous surgery group renders the study underpowered; consequently, the nonsignificant differences reported by the authors must be interpreted with caution.

Chen *et al.* observed that the time taken to accomplish peritoneal access was significantly longer in the patients who had undergone previous abdominal surgery; however, they did not report the reasons for this prolonged procedure

time. The incidences of catheter malfunction in patients with and without a history of abdominal surgery were 16.7% and 12.5%, respectively, although the difference between these rates was not significant. In a study by Tiong *et al.*,⁵ which was similar to the present study but which had a larger study group with a higher incidence of previous abdominal surgery (26.2%), the rate of postoperative complications was significantly greater in patients who had undergone prior surgery than in those who had not (41.9% vs 26.4%; $P=0.02$). The types of complications were not, however, specified for each group. The catheter malfunction rates reported by Chen *et al.* and the 10.4% overall rate of catheter malfunction observed by Tiong *et al.*⁵ are within the 10–19.4% range expected with a conventional open dissection approach.^{2–4}

Scars on the abdomen from previous surgery do not predict the extent of adhesions and should not be used to judge eligibility for peritoneal dialysis. Currently, laparoscopy is the only practical way to reliably investigate the suitability of the peritoneal cavity for dialysis in patients with a history of abdominal surgery.^{2–5} Conventional open catheter placement is a suboptimal approach for these individuals.⁵ Laparoscopy, with adjunctive procedures enabled by this modality (e.g. adhesiolysis and omentopexy), has reduced the rate of catheter insertion failure for reason of adhesions to less than 2% and the overall rate of catheter flow dysfunction to less than 3%.^{2,4}

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Competing interests

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PRACTICE POINT

Previous abdominal surgery is not a contraindication for peritoneal dialysis, but it does indicate that laparoscopy should be employed when creating the peritoneal access