

Videolaparoscopy with Omentopexy: A New Technique to Allow Placement of a Catheter for Continuous Ambulatory Peritoneal Dialysis

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Abstract Malfunction of a peritoneal dialysis (PD) catheter is common and usually occurs shortly after its insertion, due to omental wrapping. In fact, we have encountered this complication in 183 of 578 (31.6%) patients treated at our hospital since 1987. To overcome this problem, I have devised a new laparoscopic technique for catheter insertion. First, the omentum is fixed onto the peritoneum of the lateral abdominal wall at two points using a laparoscopic instrument (Pro Tack 5-mm Auto Suture, Norwalk, CT, USA) placed at the level of the umbilicus. The catheter is then introduced through the umbilical trocar deep into the true pelvis. The cuff is positioned between the posterior rectus sheath and the rectus fibers, and the fascia is sewn. The catheter is then pulled through the 5-mm trocar site. This technique was successfully performed on ten patients with a median age of 46.1 years. There was no morbidity or any malfunction in continuous ambulatory peritoneal dialysis (CAPD) during follow-up periods ranging from 20 days to 9 months. Therefore, this new laparoscopic technique may prevent the obstruction caused by omental wrapping in CAPD.

Key words Laparoscopy · Continuous ambulatory peritoneal dialysis · Catheter placement

Introduction

Catheter obstruction due to omental wrapping still accounts for a substantial number of catheter failures in patients on continuous ambulatory peritoneal dialysis (CAPD). The advantages of laparoscopic cholecystectomy have encouraged surgeons to develop other therapeutic laparoscopic procedures,^{1,2} including peritoneal

catheter placement and revision of catheters.^{3–5} When omental wrapping occurs, a partial omentectomy is usually performed through a laparotomy, although cases of this procedure being performed laparoscopically have recently been reported.⁶ Open revision of the CAPD catheter or replacement may expose the patient to a significant risk of leakage of the dialysis solution, as well as to the potential development of an incisional hernia.⁷ Laparoscopic omentectomy is also a very expensive procedure to perform for repair of the CAPD catheter.⁶ To overcome these problems, I recently devised a new technique of laparoscopic surgery (LS) to place peritoneal catheters and fix the omentum onto the parietal peritoneum.

This present study included ten patients, being six women and four men, ranging in age from 14 to 67 years, with a median age of 46.1 years. The causes of end-stage renal disease were hypertension in three patients, chronic glomerulonephritis in two, diabetes mellitus in two, lupus erythematosus in one, membranoproliferation glomerulonephritis in one, and unknown in one. All of the patients were considered fit enough to be an acceptable risk for general anesthesia, all presented electively, and all gave informed consent. Peritoneal catheter implantation was performed for the first time in each patient. Two patients were obese and four had previously undergone laparotomy before the CAPD catheter placement. Laparoscopic adhesiolysis was performed in three patients, and umbilical herniorrhaphy was performed in another.

Surgical Technique

Prophylactic antibiotic therapy was administered prior to the catheter implantation which was performed under general anesthesia. Standing on the right side of the patient (Fig. 1), the surgeon makes a subumbilical transverse incision, 1 cm long, through the skin, the subcuta-

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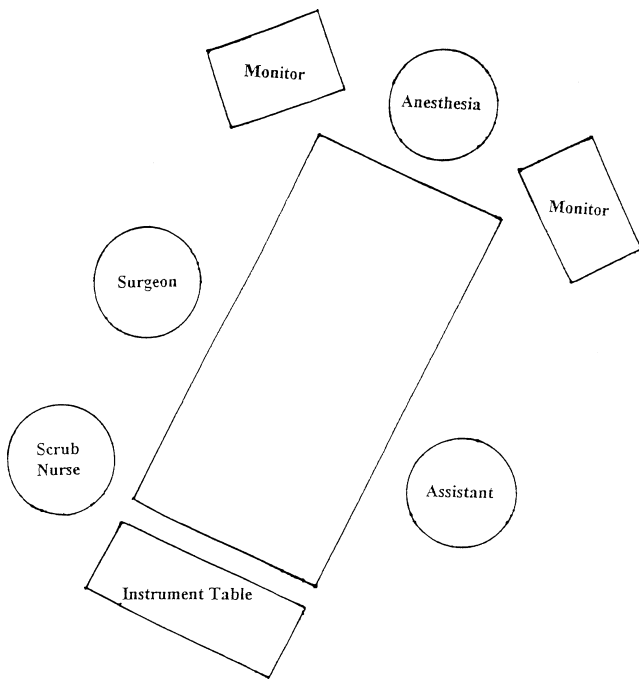


Fig. 1. Organization of the operating room for continuous ambulatory peritoneal dialysis (CAPD) catheter placement

neous tissue, and the anterior rectus sheath. The rectus muscle fibers are then dissected bluntly down to the posterior rectus sheath. A 10-mm trocar with a grip is inserted and fixed. A pneumoperitoneum is established via this trocar, inflating to a pressure of 10 mmHg. The initial exploratory laparoscopy is conducted with a 30° video laparoscope. Two 5-mm lateral rectus sheath ports are placed, one of which is used for the exit site. The operating table is tilted about 30° to enable the patient to be placed in a Trendelenburg position. The lateral inferior edges of the omentum are grasped and fixed onto the parietal peritoneum of the lateral abdominal wall at two points with a tacker (Auto Suture, ProTack 5-mm, Norwalk CT, USA at the level of the umbilicus Fig. 2). A radiopaque polyurethane catheter, 47 × 13 cm in size with two fixed cuffs (Tenckhoff, Bard, Salt Lake City, UT, USA) is threaded onto a stiffening stylet and introduced through the umbilical trocar deep into the true pelvis. The cuff is placed between the rectus sheath and rectus fibers, and the fascia is sewn tightly with 0 prolene sutures. The catheter is grasped with a hemostat and pulled through the 5-mm trocar site. The operation is completed by closing the other port sites with sutures, and catheter patency is verified by a rapid in-and-out exchange before the patient is transferred back to the ward.

The operating time ranged between 30 and 90 min (median, 50 min). After a median follow-up period of 5.5 months, no morbidity was found to be associated

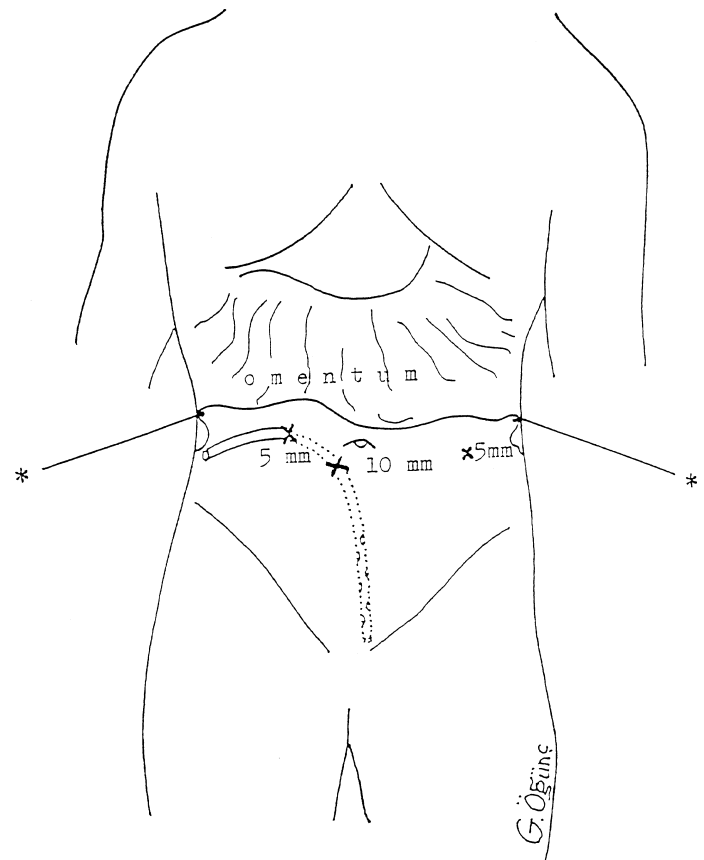


Fig. 2. Port sites for laparoscopic CAPD catheter placement and omental fixation points (asterisks)

with this procedure in the short term. All catheters functioned well postoperatively.

Discussion

Permanent and safe access to the peritoneal cavity is the primary means of achieving successful CAPD.⁷ Catheter failure caused by omental wrapping, migration, leakage, tunnel infection, and peritonitis leads to substantial morbidity and is a major cause of complications developing in patients on CAPD.⁷ Catheter outflow obstruction is common in peritoneal dialysis and usually occurs shortly after peritoneal catheter insertion due to omental wrapping, as observed in 183 of 578 (31.6%) patients treated in our hospital since 1987. Furthermore, up to 20% of patient transfers to hemodialysis are directly related to catheter problems.⁷ Laparoscopic surgery has been used with a new omental fixation technique to prevent the obstruction caused by omental wrapping in CAPD.

To treat catheter obstruction due to omental wrapping, a partial omentectomy is required, which can be

performed either by laparotomy or laparoscopically.⁶ Open revision of the CAPD catheter may expose the patient to a significant risk of leakage of the dialysis solution as well as to the potential development of an incisional hernia.⁷ Performing partial omentectomy by laparoscopy is also relatively expensive.⁶

Four of our ten patients had previously undergone laparotomy before the CAPD catheter placement, and laparoscopic adhesiolysis was performed in three of these patients. Treatment of the accompanying surgical pathology at the time of laparoscopic surgery appears to be the ideal method.⁸

In conclusion, this new laparoscopic technique of omentopexy for peritoneal dialysis catheter placement could prove extremely useful for salvaging catheter malfunction caused by omental wrapping.

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