ORIGINAL ARTICLE

Peritoneoscopic insertion of peritoneal dialysis catheters by nephrologists. A single centre preliminary experience

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Abstract

Background: Peritoneal Dialysis (PD) catheter has been characterized as the "lifeline" of PD patients. Timely and effective insertion of the PD catheter is essential for the success of a PD program. We describe our initial experience with peritoneoscopic implantation of PD catheters by nephrologists.

Patients and Methods: Twenty-one patients underwent peritoneoscopic PD catheter implantation in our centre during 2007 – 2009. Their mean age was 57.3±14.7 years, 8 patients (38%) were transferred from hemodialysis and 12 patients (57%) had a previous history of uncomplicated abdominal surgery for various reasons.

Results: All PD catheters were inserted under local anaesthesia in a nephrology ward. There were no major complications during, or immediately after catheter implantation. There were 4 cases of eosinophilic peritonitis following air entrapment in the peritoneal cavity. PD fluid leak was observed in two cases and an abdominal hernia in one case. The PD catheter did not work properly in 3 cases and in two of them the catheter was removed and replaced by a new one by surgeons. During the follow up period a total of 5 catheters were removed: three of them after successful renal transplantation and two due to poor functioning.

Conclusions: PD catheter insertion by nephrologists with peritoneoscopy is a rather simple, safe and efficient method. It offers the opportunity for timely initiation of PD and a relative independence from surgeons, reducing the waiting times and therefore enhancing PD uptake. Hippokratia 2011; 15 (Suppl 2): 27-29

Key words: catheter, peritoneal dialysis, peritoneoscopy

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Peritoneal Dialysis (PD) has been established as an effective therapy for End Stage Renal Disease (ESRD). However, PD is constantly declining as a dialysis modality in Europe and US, whereas its prevalence remains high in Asia[1]. Among the several reasons that may contribute to its decline[1,2], a key factor remains the permanent access to the peritoneal cavity. The PD catheter has been characterized as the "lifeline" of the PD patient and catheter related problems remain a cause of permanent transfer to hemodialysis (HD) in up to 20% of patients needing a therapy change[3].

PD catheters should provide rapid dialysate flow rates without leaks or infections and should be placed by an experienced operator. Although traditionally the vast majority of PD catheters has been inserted by surgeons[3,4], many nephrologists have started getting involved in catheter insertion, by percutaneous methods using the Seldinger technique[5,6], or more recently by the peritoneoscopic method[7-10].

PD catheter implantation by nephrologists has been reported to improve PD utilization and expansion of the PD programs in US[10,11], or Asia[12,13], mainly due to timely placement of the PD catheter, avoiding unnecessary delays that may drive patients to permanent HD.

Our PD program was started in 1996 and the PD catheters were inserted by surgeons using the open dissection technique under local or general anaesthesia in an operating room. However, during the last years we have observed a big delay in PD catheter insertions (more than months) due tight operating theatre schedules that made many patients to select HD and started to jeopardize our PD program. So, we decided to start a PD catheter implantation program by using the peritoneoscopic technique operated by ourselves. This technique is minimally invasive, rather simple to learn and quick and offers the opportunities to have a visual inspection of the peritoneal cavity and stabilize the deep cuff into the rectus sheath.

Materials and Methods

We prospectively collected data from all patients which underwent peritoneoscopic insertion of PD catheters in our unit from 2007 to 2009. Patient demographics are shown in table 1. Twelve (12) patients (pts) had a history of previous uncomplicated abdominal operations such as appendectomy (3 pts), cholecystectomy (5 pts), caesarian section (2 pts) and renal transplantation (2 pts). Eight patients (38%) were transferred from HD due to vascular access problems

We used a modified peritoneoscopic technique,

Number of Patients	21
Age	57.3±14.7 (30-83)
Males	13 (61%)
Causes of ESRD	
Glomerulonephritis	5
Diabetic Nephropathy	4
Unknown Etiology	8
Chronic Allograft Nephropathy	2
Polycystic Kidney Disease	1
Malignant Hypertension	1

Table 1: Demographics of the patient population.

applying an initial step with a laparoscopic Veress needle, as introduced by Asif et al, in order to reduce the risk of bowel perforation[8]. All patients were admitted one day before the procedure receiving laxatives and enemas for bowel preparation and antibiotic prophylaxis with vancomycin i.v. one hour before catheter implantation. Catheter break-in for initiation of PD was usually performed after 2 weeks post implantation.

Results

All PD catheters (coiled double cuff Tenckhoff catheters) were placed in a nephrology ward under local anaesthesia. Most catheters (19) were placed on the left lateral border of the rectus sheath 2-3 cm below umbilicus and two (2) on the right side due to the presence of a renal allograft on the left side.

There were no major complications during and immediately after catheter implantation. Mild tingeing of dialysate with blood was noted in five (5) cases that were cleared with subsequent exchanges the next day after implantation.

In four cases a cloudy effluent was observed during the first week after catheter implantation due to eosinophilic peritonitis, after air entrapment in the peritoneal cavity.

PD fluid leak was observed in two cases. In one case, as PD was immediately introduced in an old lady, whereas in the second case, leaking was observed after one month of in hospital intermitted PD.

PD catheter migration was seen in four (4) patients: in three of them, after at least 3 months post catheter implantation due to constipation and was treated successfully by laxatives and in one case during the first days after catheter placement. That catheter was repositioned under direct fluoroscopic control.

There was only one case of incisional hernia observed in a thin female patient after 4 months of CAPD therapy probably due to increased intra-abdominal pressure.

In three patients the PD catheter could not work properly. One case was due to PD catheter occlusion by a large intraluminal fibrin clot, repaired by laparoscopic surgery, whereas two catheters had to be removed and replaced in one time by our surgical team.

During the follow-up period a total of 5 PD catheters were removed: three during operations for renal transplantation and two due to poor functioning leading to a total primary catheter failure of 10%.

Discussion

Here, we describe our initial experience with peritoneoscopic PD catheter implantation in twenty-one (21) patients. This technique is minimally invasive, rather simple to learn and quick, leading to independence from surgeons or anaesthesiologists and operating theatres.

We decided to use it as the delay in PD catheter implantation in our hospital (more than months) had started to jeopardize our PD program. By using this technique there was no more waiting time for catheter implantation, as the PD catheters were placed in a nephrology ward.

Our total primary catheter failure was almost 10% (2/21) and rather low compared with the recommendations of the International Society of Peritoneal Dialysis[3,14] and the European Best Practice Guidelines for Peritoneal Dialysis[15] guidelines, which suggest that regardless of the technique used, one years' PD catheter survival should exceed 80%.

All except one, cases were primary PD catheter implantations. In one case the PD catheter was reinserted after an episode of fungal peritonitis and peritoneoscopy offered the advantage of visual information about the status of the peritoneal cavity[16].

With the modification of the technique[8] by applying an initial step with a laparoscopic Veress needle, we have avoided major complications such as bowel or bladder perforation, or major bleeding.

Eosinophilic peritonitis was seen in 4 cases due to air entrapment in the peritoneal cavity. This is a rather benign condition not needing antibiotic therapy or catheter removal. Reabsorption of entrapped air and/or treatment with ketotifen might be all that is required [17]. This complication was avoided during future procedures by placing the patients in the Trendelenburg position and manually compressing the abdomen gently toward the quill. In this way air can escaped through the quill inserted at the catheter insertion site.

Catheter migration is rather frequent in PD patients. It is mainly due to constipation and resolves easily by administration of laxatives or enemas. Only one PD catheter in our series needed to be corrected under direct fluoroscopy with relative ease.

Incisional hernias are more frequent after surgical placement of PD catheters due to larger incisions[3,14]. However, we observed one case of incisional hernia in a thin female patient, probably as an adverse effect of increased intra-abdominal pressure during CAPD therapy. The patient was treated by switching to Automated PD with a dry daytime.

Our experience is supporting previous studies indicating that placement of PD catheters by nephrologists is a feasible option in order to maintain and expand a PD

program[10-13]. As the European Best Practice Guidelines for Peritoneal Dialysis state, the most important element of success for PD catheter implantation does not rely on the technique used (surgical, percutaneous, or laparoscopic) but the experience of the people getting involved[15]. As Li and Chow also underline "practice makes perfect"[13], and all nephrologists dealing with PD and facing similar problems should be encouraged to start putting PD catheters by themselves regardless of the preferred technique.

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