NURSE-PERFORMED LOCAL-ANESTHETIC INSERTIONS OF PD CATHETERS: ONE UNIT'S EXPERIENCE

Peritoneal dialysis (PD) is an effective form of renal replacement therapy that provides a good quality of life and significant freedom for patients to work, socialize, and travel. Peritoneal dialysis is cost-effective compared with hospital-based or satellite-unit hemodialysis (1) and patient outcomes are at least as good as those for hemodialysis for the first few years of treatment (2–4).

Peritoneal dialysis catheters can be inserted in a variety of ways, ranging from open surgical insertion under general anesthetic (GA), to a variety of GA laparoscopic or peritoneoscopic approaches, to local anesthetic (LA) procedures usually using a blind Seldinger technique by a radiologist or nephrologist. The Seldinger technique involves the introduction of a soft guidewire into the peritoneal cavity through a needle. A dilator including a peel away sheath is then inserted, through which the PD catheter is placed. Multiple studies indicate that there is no significant difference in outcome between any of the insertion techniques (7–11) although local-anesthetic Seldinger insertions are not suitable for patients with significant previous abdominal surgery, a high possibility of peritoneal adhesions, or those with marked abdominal obesity. Nevertheless, the local anesthetic technique has the advantages of simplicity, low-cost, and the ability to insert a PD catheter rapidly, for example in a patient who presents acutely with end-stage kidney disease. Insertion by a nephrologist also keeps the process under the control of the clinical team that is directly involved in the patient's care, and this may result in higher rates of PD utilization (12).

Suitably trained nurses have, for many years and in many countries, been successfully inserting central intravenous catheters (11,12), a procedure with a similar or perhaps higher risk of complications than LA PD catheter insertion. These nurses are often part of hospital-wide, central-line insertion teams, developed with the recognition that central-line insertions have frequently been done by relatively inexperienced junior doctors who perform a small number of procedures. Nurse insertion of central lines has been shown to be a cost-effective approach, with members of the nursing team gaining a great deal of experience in line insertion and with outcomes that are at least as good as those obtained when lines are inserted by medical staff.

Our unit identified the potential benefits of nursing staff inserting PD catheters in 2009. A senior specialist who inserted the large majority of the LA PD catheters in our unit was about to retire and, although we considered training specialist renal registrars, their high turnover and the relatively low number

of LA PD catheter insertions meant that any individual junior doctor would never gain extensive experience. Although consultant nephrologists could be considered to be ideally placed to do the procedure, the demands on their time can reduce their availability to provide a responsive catheter service. Nurses therefore seemed the best candidates to undertake training to lead the LA PD access program. The largest obstacle to starting this initiative was precedent as there were no nurse role models who inserted PD catheters either nationally or internationally. We therefore decided to use the well-documented pathway of nurse-inserted central venous catheters as a model.

Initially there was discussion and anxiety about who would be responsible for the practice of any nurses who undertook LA PD catheter insertion. However, it was agreed that practitioners, whether medical or nursing, are always responsible for their own practice and need to operate independently. Legally, agreement and support from the hospital for this new nurse-led service was required to achieve indemnity in a case of serious harm. As a first step, several nurses from our unit attended the UK PD Access Academy to learn the simulated procedure and were signed off as competent. Appropriate documentation was produced giving: a) the Standard Operating Procedure for Peritoneal Dialysis Catheter Insertion under Local Anesthetic using the Seldinger technique (online supplement 1); b) a Competency Document detailing previous experience essential to the new nursing role (online supplement 2); and c) the detailed elements of training to perform LA PD catheter insertion, with a timeline for training and sign-off to be completed in association with a mentor.

This documentation was then presented to and approved by the renal unit management team, the Trust Directors of Nursing and Education, the hospital committee responsible for New and Novel Procedures and the Trust legal team. Finally, after 9 months, the Trust agreed that the program could start. The next day, the first nurse commenced her training.

The benefits of nurse-inserted PD catheters include the opportunity for 1 or more individuals to gain extensive experience of the procedure. The nursing staff in our PD program were already familiar with LA catheter insertion, as they had always assisted with the procedure and nurses acting as surgeons would complete the cycle of care and improve continuity from assessment to self-care on PD therapy. In addition, the planning of the ideal position for the PD catheter exit site is often best done by nurses, who deal with dressings and practical issues on a day-to-day basis. The patients accept the procedure being performed by a nurse and seem to welcome the continuity of care when the same

Supplemental material available at www.pdconnect.com

individuals are involved in the initial assessment for PD, the planning of the placement of the PD catheter, the insertion of the catheter and then subsequent follow-up and the commencement of training.

Currently, approximately 80% of catheter insertions in our unit are performed under LA using a blind Seldinger technique. We fail to get a catheter into the peritoneum in 10 to 15% of cases, and the procedure is abandoned; this percentage has been reduced in the past few years with the introduction of an upper body mass index (BMI) threshold of approximately 35 kg/m² for LA PD catheter insertion. The nurse specialist started inserting PD catheters in 2010, and, to date, this individual has performed 218 out of the total of 355 LA catheter insertions (60.5%), with a failure rate of 10.3% (22 patients).

Our combined experience and multidisciplinary approach to LA PD catheter access has led to the expansion of our program and the development of new techniques to manage catheter complications such as repositioning catheters that have migrated (13) and the creation of new exit sites with removal of the external cuff in patients with persistent exit-site infections. In addition to the catheter insertions, the nurse specialist has completed another 163 LA PD catheter procedures including removals, removal and reinsertions at the same operation, catheter repositions, and creation of new exit sites.

Our experience of nurse-performed PD catheter insertions has been very positive both for the patients and the PD program. Our PD program has grown since a nurse started inserting PD catheters. Our inpatient bed utilization for PD, in part as a result of performing numerous day-case PD catheter procedures under LA, has fallen from 857 bed days in 2008, to 507 in 2015 despite a slight growth in the PD program. The highest increase of patient numbers during this period was by 28% though the population fluctuates according to demand. This initiative has also enabled the introduction of an acute, urgent-start PD program. Having a PD access team led by a nurse also helps us ensure that patients who present late with end-stage renal failure (ESRF) or change their modality choice at a late stage have access to our PD program. The ease of catheter insertion for most patients has also helped us use PD successfully as a treatment modality in elderly or frail patients and those with severe cardiac disease who might otherwise have chosen a conservative care pathway.

We initially applied strict parameters for determining exclusion criteria for inserting a catheter under LA. Our combined experience and positive outcomes have meant that these have been modified over the years. We now are happy to attempt LA catheter insertion in patients with previous cesarean section, uncomplicated appendectomy, and gallbladder surgery, although we will not attempt an LA insertion in patients with scars close to the umbilicus or in those with a history that suggests a high chance of significant peritoneal adhesions. If the guidewire does not advance smoothly, we abandon the procedure and plan a GA catheter insertion. This team approach means we are always learning though each other's experience and complications. The standard oper-

ating procedure has changed over the years to reflect this, with the development of a customized Safe Surgery Check List and the introduction of a bladder ultrasound prior to each procedure.

The creation of a team to insert LA PD catheters, led by a nurse, has increased the confidence of other team members to refer patients to PD; we have taken referrals for PD catheter insertion from healthcare assistants, counsellors, dieticians, ward nurses, hemodialysis nurses, and the occasional external renal consultant.

We are about to start training a second nurse for PD catheter insertion with the aim of having 4–5 individuals in the renal unit capable of inserting LA PD catheters (2 senior nurses, 1–2 consultants, and an associate specialist). The nurse specialist has also trained several doctors and 1 nurse who are inserting PD catheters in other units. We hope our experience can now be used by other units as the precedent we lacked.

DISCLOSURES

The authors have no financial conflicts of interest to declare.

Elaine Bowes*
Bhezad Ansari
Hugh Cairns

Department of Renal Medicine, King's College Hospital
London, UK

*email: elaine.bowes@nhs.net

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