

Strangulated umbilical hernia in a peritoneal dialysis patient

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ABSTRACT

Hernia is one of the commonest complications of peritoneal dialysis. It is recommended that patients undergo surgical repair of hernias immediately after the diagnosis. We report a patient on continuous ambulatory peritoneal dialysis presenting with strangulated umbilical hernia. He underwent resection of the gangrenous ileum and end-to-end anastomosis. He was shifted to hemodialysis on second postoperative day and was continued on hemodialysis for 2 weeks. In the third week, he was initiated on low volume PD exchanges and by the fourth week, he returned to normal CAPD exchanges.

Key words: Peritoneal dialysis, strangulation, umbilical hernia

Introduction

Continuous ambulatory peritoneal dialysis (CAPD) is one of the treatment options for patients with chronic kidney disease (CKD). Hernias are one of the most common complications of peritoneal dialysis (PD). They can be unsightly and pose a risk for bowel incarceration and even strangulation. For these reasons, it is usually recommended that patients undergo surgical repair of hernias. Most of the recent studies recommended continuation of PD around the hernia repair. However, hernia complicated with strangulation requires transfer to hemodialysis during hernia repair to prevent peritonitis. We report a patient on CAPD presenting with strangulated umbilical hernia. He was temporarily shifted to hemodialysis following hernia repair.

Case Report

A 40-year-old nondiabetic man was diagnosed with CKD in March 2006. He was initiated on hemodialysis through left brachiocephalic arteriovenous fistula (AVF). He underwent surgical placement of double-cuffed, swan-neck, Tenckhoff catheter under local anesthesia in December 2008. He was initiated on regular CAPD exchanges after 2 weeks of break-in period. His peritoneal equilibration test showed high-average transporter status. His residual urine output was 250 ml per day. He was on three exchanges per day with 2.5% dextrose solution and achieved around 1500 ml ultrafiltration daily. After 2 months of initiation of CAPD, he noticed a small swelling at the umbilicus which reduced in size in lying posture and increased on standing. After 4 months, he presented with complaints of pain abdomen and vomiting of 5 days' duration. Pain abdomen was severe in intensity, colicky in nature, periumbilical, and nonradiating. He had bilious vomiting 4–5 episodes a day. He also complained of progressive abdomen distension and constipation of 2 days' duration. There were no complaints of fever, loose motion, or cloudy PD fluid. There were no previous episodes of peritonitis. He also denied history of abdominal surgeries or hernias prior to CAPD initiation. On physical examination, he was dehydrated and blood pressure was 100/70 mmHg. Abdominal examination showed irreducible umbilical hernia of 6 cm in size. The swelling was tense and tender. There was no expansile cough impulse. Bowel sounds were absent. Rectal examination showed empty rectum.

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Cardiovascular and respiratory system examination were unremarkable. Investigations revealed hemoglobin 8.6 g/dl, total leukocyte count 11,000/mm³, blood urea 70 mg/dl, serum creatinine 11.2 mg/dl, serum sodium 136 meq/l, potassium 4.2 meq/l, chlorides 94 meq/l, total proteins 7.0 g/dl, serum albumin 3.2 g/dl, serum alkaline phosphatase 196 IU/L, alanine aminotransferase 10 U/L, and aspartate aminotransferase 13 U/L; viral markers were negative; chest radiograph was normal; and abdominal radiograph showed dilated small bowel loops with multiple air fluid levels. A diagnosis of obstructed umbilical hernia was made. CAPD exchanges were continued till a day before surgery. He underwent laparotomy under general anesthesia. On opening the abdomen, hernial sac of 6 cm was found and there was 4 cm defect in the rectus. The rectus defect was enlarged on either side and the peritoneum over the umbilical hernia was opened. Ileal gangrene of 15 cm was noted, proximal small bowel loops were mildly dilated [Figure 1]. He underwent resection of the gangrenous ileum and end-to-end anastomosis in two layers. After reducing the peritoneum of the hernial sac, the rectus defect was closed. Tenckhoff PD catheter was not disturbed [Figure 2]. He was on Ryles tube aspiration for 2 days, and antibiotics for 10 days. Sutures were removed on the 10th postoperative day. He was temporarily shifted to hemodialysis through left brachiocephalic AVF on the second postoperative day and was continued on hemodialysis three times a week for 2 weeks. On the third week, he was initiated on CAPD exchanges with 1 L of 2.5% dextrose three times a day. Initially the PD fluid was slightly hemorrhagic. Gradually by the fourth week, he returned to normal CAPD exchanges with 2 L of 2.5% dextrose and around 1 L clear ultrafiltration. There was no leakage either from the incision site or the exit site.

Discussion

In CAPD patients, abdominal hernias are not uncommon. The prevalence of hernia in PD patients is higher than that in the general population. The reported prevalence of this complication ranged from 9% to 32% in most series,^[1-5] with an incidence of 0.06 hernias per dialysis-year at risk.^[6]

In addition to the hydrostatic pressures and the anatomically weak sites such as the inguinal canal and the umbilicus, other contributing factors to the formation of hernias in PD patients include uremia, obesity, and poor nutrition secondary to transperitoneal protein loss, anemia, and the sites of previous abdominal wall surgical procedures. The site of the hernia may be incisional, inguinal, umbilical, epigastric, spigelian, and even diaphragmatic. In the early 1980s, the most



Figure 1: Intra-operative photograph showing gangrenous ileal loops and mildly dilated proximal small bowel loops



Figure 2: Post-operative photograph showing intact Tenckhoff peritoneal dialysis catheter

common location was the inguinal area (23%).^[7] With the utilization of a paramedian approach to PD catheter insertion, umbilical hernia now seems to be the most frequent type of hernia.^[4,8] The time on PD prior to hernioplasty was close to 12 months.^[4,5,9] Hernias detected before initiation of CAPD should be repaired before the catheter is installed.^[10] Performing the hernia repair as a separate procedure prior to inserting the CAPD catheter has disadvantages; the patient must undergo two anesthetics and there is a delay in starting PD while the hernia repair is allowed to heal.

A systematic repair of abdominal defects and insertion of the CAPD catheter can be done simultaneously.^[4,11] The development of a hernia after the initiation of CAPD does not necessitate discontinuation of CAPD. It is recommended that patients undergo surgical repair of hernias immediately after the diagnosis. Otherwise it may pose a risk for bowel incarceration and even

strangulation.^[12] In five of 31 hernia episodes (four women and one man), presentation was accompanied by complete bowel obstruction, while one episode presented as incomplete intestinal obstruction.^[10] In a review by Rocoo *et al.*,^[7] 27 (13.2%) of the 174 CAPD patients with hernias were strangulated or incarcerated. There are two case reports of hernia through the peritoneal entry of the Tenckhoff catheter.^[13] The hernial orifices were small, and thus strangulation of bowel was a common feature in both the patients. Nq *et al.*^[14] also reported a case of pericatheter herniation with small bowel incarceration in a CAPD patient. However, the predominant clinical features were signs of a severe catheter tunnel infection rather than ileus. Lee *et al.*^[15] reported a case of strangulated umbilical hernia with perforation misdiagnosed as CAPD peritonitis. The patient was operated 36 h after the first inspection but expired due to overwhelming sepsis 257 days after the admission to hospital.

In a series by Chan *et al.*,^[16] one of eight abdominal hernias died of strangulated incisional hernia. Other strangulated hernias reported in patients undergoing CAPD were umbilical^[1] and epigastric.^[17]

There are no guidelines as to whether PD treatment can be safely continued after hernioplasty or should be withheld postoperatively in order to avoid stress in the repair.^[5,9] To allow proper healing and to avoid postoperative dialysate leakage from hernia repair site or early hernia recurrence, treatment is commonly withheld for several days or even weeks. Imvrios *et al.*^[3] started their patients on PD within a few hours of surgery, with reduced volume and increased frequency. Lewis *et al.*^[18] restarted PD within 24 h in 100% of postoperative recoveries, as did Guzman-Valdivia *et al.*^[19] Mettang *et al.*^[9] utilized low-volume high-frequency exchanges within 1–3 days after surgery. Tension-free hernia repair with polypropylene mesh reinforcement allowed the patient to commence or continue PD as early as 24 h after surgery,^[20] thus avoiding the need for a change in dialysis modality and offering advantages both to patients and to hard-pressed hemodialysis programs. Gustavo Martínez-Mier *et al.*^[8] also supported the idea that early restoration of PD with low exchange volume after hernioplasty was feasible, avoiding temporary hemodialysis. Shah *et al.*^[21] recommended continuation on standard PD therapy until the morning of the surgery, followed by no dialysis for the first 48 h and intermittent PD 3 times per week (1 L exchange for 10 h) for 2 weeks, low-volume CAPD for another 2 weeks, and resumption of the preoperative PD prescription after 4–5 weeks, with excellent results. Another PD management protocol had been suggested by Crabtree *et al.*^[22] in which low-volume automated PD exchanges were used, with an initial fill volume of 1 L,

which was gradually increased to 1.5 L the second week, and with resumption of usual dialysis regimen thereafter.

In strangulated hernia, the integrity of the intestinal mucosa may be disrupted, compromising the bacterial barrier of the bowel wall. This may increase the risk for enteric peritonitis. Even though recent studies recommend continuation of PD following hernia repair, consideration should be given to transferring the patient temporarily to hemodialysis if the hernia is associated with bowel incarceration and strangulation. Cherney *et al.*^[5] reported a 45.4% incidence of temporary hemodialysis in PD patients with incarcerated abdominal wall hernias. In a protocol recommended by Shah *et al.*,^[21] patients with bowel strangulation were not included and were often changed temporarily to hemodialysis when bowel ischemia was suspected. Our patient was found to have gangrenous ileal loop on opening the hernial sac, hence was changed to hemodialysis temporarily after hernia repair. He resumed CAPD 2 weeks after hernia repair.

In conclusion, we recommend hernia repair in patients on CAPD in order to decrease the incidence of hernia complications; bowel obstruction, incarceration, and even strangulation. Continuation of PD with initially low-volume and frequent exchanges and then gradually increasing the volume is a feasible possibility in patients undergoing hernioplasty. However, patients with strangulated hernia require temporary change to hemodialysis to prevent peritonitis.

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