

# Minimally Invasive Surgical Option in a Patient on Peritoneal Dialysis - A Case Report

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**Abstract:** Clinicians often view abdominal surgery as unsuitable for patients undergoing peritoneal dialysis, despite the lack of clear indicators for peritoneal dialysis failure. Advances in technology have led to more minimally invasive options that are more patient friendly. Peritoneal dialysis allows patients to avoid the demanding nature of haemodialysis and reduce hospital admissions. However, abdominal surgeries may cause a leakage of peritoneal dialysate from the surgical site. Laparoscopic surgeries can help avoid this issue and are therefore recommended for patients on peritoneal dialysis. We present a case of a patient who underwent a total laparoscopic hysterectomy while receiving peritoneal dialysis. Laparoscopic hysterectomy is suggested to be safe and feasible and allows early resumption of dialysis, in patients who are receiving peritoneal dialysis, however, mandates complete peritonealisation.

**Keywords:** Peritoneal dialysis, hysterectomy, laparoscopy, total laparoscopic hysterectomy, adenomyosis, peritonealisation

## 1. Introduction

The reported prevalence of Chronic kidney disease (CKD) in India is around 17%; and ranges from <1% to 13% in different regions<sup>1,2</sup>. Haemodialysis (HD), peritoneal dialysis (PD) and kidney transplant are the three modalities of treatment offered to these patients. Peritoneal Dialysis, introduced in India in 1991, offers an advantage to those patients who find it difficult to take up haemodialysis either due to financial constraints or due to location wherein haemodialysis is mostly available in cities<sup>3</sup>.

Abdominal surgeries have been found to be associated with higher chances of perioperative complications like dialysate fluid leakage, wound dehiscence, incisional hernia, peritonitis and hemoperitoneum<sup>4</sup>. Laparoscopic surgeries being less invasive, cause less stress on the peritoneum, can avoid these problems and hence are advocated for surgery in these patients<sup>5</sup>; however, very few cases have been reported in the literature. We herein report total laparoscopic hysterectomy in a patient with severe adenomyosis, uncontrolled bleeding not responding to medical management, receiving peritoneal dialysis.

## 2. Case Presentation

A 43 years old lady, P3L3, presented with bleeding PV for 15 days that has continued from her LMP. The patient also had breathing difficulty, chest pain and few episodes of vomiting prior to admission. Prior to presenting to us, the patient had been taking treatment for the previous 1 year for abnormal uterine bleeding. She has been receiving cyclical progesterone over the last one year, however, she continued to have irregular and severe bleeding, despite being on regular medications. She is a known case of CKD on peritoneal dialysis, diabetic on diet control and hypertensive.

The patient was severely anaemic and on pelvic examination her uterus was uniformly enlarged to around 10 weeks size. Ultrasonography of the abdomen and pelvis was done which

showed an enlarged uterus with thickened endometrium of 27mm. She was already receiving peritoneal dialysis which was continued.

This time when the patient presented to us, she was on progesterone but despite that she continued to bleed. She was initially treated with medical therapy by increasing the dose of progesterone and administering haemostatics like tranexamic acid. She also received packed red blood cells transfusion as her haemoglobin was less; despite these methods, her bleeding did not reduce. Her haemoglobin continued to fall even after blood transfusions due to the continuous bleeding per vaginum. In view of thickened endometrium on ultrasonography, endometrial biopsy was done which reported endometrial hyperplasia without atypia. Due to uncontrolled bleeding which was not getting controlled despite all medical measures and also leading to fall in haemoglobin, the patient was planned for laparoscopic hysterectomy.

Pre-operative optimization was done. During the surgery, adequate care was taken to keep the PD Catheter clean (PIC 1). Ports placed were kept away from the PD Catheter – 10mm Optical port introduced through the Palmer's Point and two 5 mm infraumbilical operating ports on each side of midline. This position of the ports (as they were distantly placed from the PD catheter) helped us avoid any injury to the catheter during the surgery. Also, the reduced number of ports helped us in reducing the breaks in the peritoneum. No intra-abdominal adhesions were present (PIC 2,3). Total laparoscopic hysterectomy with bilateral salpingo-oophorectomy was performed. Specimen was removed from the vagina. Vault was then closed in two layers – complete closure of the vaginal vault and then the peritoneum closed separately as depicted in the picture (PIC 3). Blood loss during the surgery was minimal. PD Catheter was intact and close to the vault in the abdominal cavity (PIC 4), without being damaged. She withstood the procedure well.

Post-operatively, on day 7 of the surgery of the surgery, the patient developed fever, painful oedema at the haemodialysis catheter site. She also complained of vaginal discharge per vaginam. Haemodialysis catheter was changed and sent for culture sensitivity which reported as the presence of Vancomycin resistant E.coli sensitive to linezolid. CT abdomen and pelvis revealed collection at the vaginal vault area. Under sedation, vaginal vault was opened on day 13, around 20ml pus drained, area cleansed with betadine and vaginal drains were kept for the remaining pus to drain. Post procedure, vaginal area was kept clean with betadine vaginal pessaries. Drains fell out on its own, discharge dried up after antibiotic escalation by day 21; however, we did not open the closed peritoneal layer to drain the pus. PD was resumed on day 16, despite, the treatment for the pus discharge was still going on. There was no leakage of dialysate fluid. The patient recovered fully by day 25 of the surgery and was discharged on day 28. She is continuing to have her follow-up regularly, having her PD at her hometown, being 1 year now from the date of surgery.

### 3. Discussion

Women suffering from chronic kidney disease suffer from a range of reproductive and menstrual health issues like abnormal uterine bleeding (AUB), sexual dysfunction, reduced fertility, and higher risks of pregnancies and associated pregnancy complications<sup>6,7</sup>. Abnormal uterine bleeding is found to be present in about 10% of females with CKD, however, around 10% have heavy menstrual bleeding<sup>8</sup>. Our patient, with CKD, on peritoneal dialysis and abnormal uterine bleeding, had been taking hormonal therapy for the same for a prolonged period of time, however, she had to be planned for hysterectomy because she failed to respond to progesterone and bleeding could not be controlled.

Patients on peritoneal dialysis need to be carefully planned for surgery. Abdominal surgeries in these patients have considerable risk of developing complications like peritoneal dialysate leakage, wound infection, wound dehiscence, peritonitis, hemoperitoneum, incisional hernia and at times may lead to removal of PD catheter due to these complications<sup>5</sup>. Therefore, surgeries in these patients need to be carefully planned in order to minimise these complications and having a more favourable outcome. Laparoscopic surgeries offer a great advantage to such patients in minimizing such complications.

We carefully planned our patient peri-operatively. Surgical steps were planned that ensured minimum number of breaks in the peritoneum. Port placement was planned that included the size of the optical port (10mm) and the operating ports (5mm). The surgery was planned keeping the number of ports less (total 3 in number – one optical and 2 operating) which would reduce break in the peritoneum. The PD catheter was kept away from the operating field to avoid displacement. Uterus was removed vaginally and vault was closed in 2 layers–complete closure of the peritoneum and then the vaginal vault. Before ending the surgery, complete peritonealisation of the ports was also ensured. Anaesthesia to the patient was also planned, patient optimized which made her intraoperative course uneventful. Postoperatively,

she developed vault infection but could be managed conservatively with higher antibiotics and opening of the vault which healed after the course of antibiotics. The PD which was resumed on day 16 continued despite the vault infection. There was no leakage of dialysate or spread of infection. This could be attributed to a good and complete closure of the breaks in peritoneum that occurred during surgery. It is a well-known fact that peritoneal healing starts as early as 48 hours to up to 5,6 days<sup>9</sup>, along with small size of the peritoneal break may lead to faster peritonealisation with early resumption of peritoneal dialysis.

Tomohito Tanaka, Shoko Ueda et al have also reported an early resumption of PD using the same PD catheter, with minimal postoperative complications<sup>10</sup>. Lew et al. have reported a case of robotic assisted total laparoscopic hysterectomy for endometrial cancer in a PD patient where PD could be resumed three days after surgery, although the patient suffered from perioperative complications, including opiate-associated constipation and peritonitis<sup>11</sup>, which is very similar to our case scenario where PD was resumed and continued despite developing postoperative complications that could be treated and the patient is continuing to be on PD - one year after the procedure. Other authors<sup>10,12</sup> have also reported similar outcomes when they have performed laparoscopic surgeries for other conditions in these patients, however, Kakuda et al. performed total laparoscopic hysterectomy for endometrial cancer in a patient receiving PD, while they successfully performed the procedure, PD could not be restarted due to leakage of dialysate fluid<sup>13</sup>.

Peritoneal dialysis is one of the effective modalities of treating patients with chronic kidney disease. It helps in avoiding the strenuous haemodialysis, reduces hospital admissions, can be carried out at remote places, economic and thus patient friendly. Patients requiring abdominal surgeries may be planned for laparoscopic surgeries which are more beneficial to them in resuming the dialysis and also does not need removal of the PD catheter. However, evidence is less and only few cases have been reported. We report this case, with the following observations which are consistent with the observations of the other reported cases<sup>10,11,12,13</sup>:

- a) A pre-operative planning and optimization of the case for both surgical steps, intraoperative and postoperative management.
- b) The PD catheter should be cleansed and covered with sterile gauze during the surgery.
- c) Ports should be planned so, that they are away from the PD catheter thus avoiding any damage to it during port insertion, PD catheter should also be kept away from the operating field – to avoid its contamination.
- d) If possible keep the number of ports limited – limits the areas of break in the peritoneum.
- e) PD catheter may be flushed with normal saline to ensure that it does not get blocked after surgery.
- f) Ensure suturing the peritoneum at all the break points at the end of the surgery, this also prevents adhesion formation.
- g) PD may initially be started with low volume of the dialysate which can be gradually increased. This reduces the stress of performing by the injured peritoneum which is in its healing stage.

h) A carefully planned postoperative management gives good outcomes.

To conclude, laparoscopic surgery is advantageous in patients with CKD on peritoneal dialysis in early resumption of PD with minimal complications, however, not many cases have been reported and this observation needs more data and studies.

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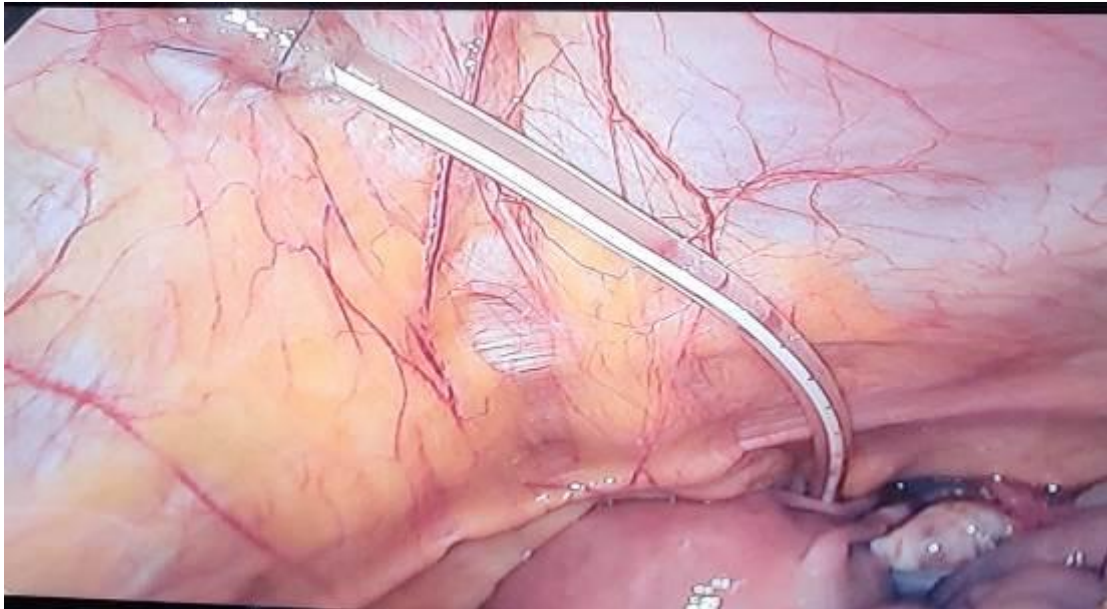
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### Figures



**PIC 1:** Picture showing painting of the abdomen while maintaining the PD Catheter clean



**PIC 2:** Intra-abdominal picture showing the site of insertion of PD Catheter i



**PIC 3:** Showing complete peritonealization of the vault after TLH



**PIC 4:** Picture showing complete peritonealisation of the vault after TLH with the PD Catheter intact