The Ochsner Journal 9:17–19, 2009

Laparoscopic Cholecystectomy in Chronic Ambulatory Peritoneal Dialysis

Jennifer F. Ha, MBBS (Hons),*† Harsha Chandraratna, MBBS, FRACS†‡§

**Department of General Surgery, University of Western Australia, Nedlands, Western Australia*
†Department of General Surgery, St John of God Hospital, Subiaco, Western Australia
‡Sir Charles Gairdner Hospital, Nedlands, Western Australia
§University of Notre Dame, Fremantle, Western Australia

ABSTRACT

Laparoscopic cholecystectomy is the established procedure for treatment of cholelithiasis. There is no consensus on its use in patients receiving chronic ambulatory peritoneal dialysis, and there is no clear recommendation in the literature of how to manage perioperative dialysis. With the increased practice of laparoscopic techniques, peritoneal dialysis can be resumed soon after the surgical procedure without interruption of hemodialysis. We present a successful case of laparoscopic cholecystectomy in a patient receiving chronic ambulatory peritoneal dialysis, and we recommend that laparoscopic cholecystectomy should be used in this patient population who are often at an increased risk for perioperative complications and would benefit from a less invasive surgical technique.

INTRODUCTION

Since 1987, laparoscopic cholecystectomy (LC) has become the established procedure for treatment of cholelithiasis.[1–3] There is no consensus on the use of LC in patients receiving chronic ambulatory peritoneal dialysis (CAPD).[4] In addition, there are no clear recommendations in the literature regarding continuation or interruption of CAPD in the perioperative period among this patient population for laparoscopic procedures.[5]

Before the introduction of laparoscopic techniques, surgical interventions often required interruption of CAPD with temporary hemodialysis to allow for surgical repair and return of peritoneal integrity before CAPD could be resumed.[2,5] The traditional practice after laparoscopic surgery has been to delay reinstatement of CAPD for a minimum of 6 weeks because of the belief that increased intra-abdominal pressure would stress the peritoneum and abdominal wall at the surgical sites, which may result in peritoneal rupture and fluid leakage during CAPD.[6] In addition, there is potential for wound dehiscence, abdominal hernia, inferior ultrafiltration due to peritoneal edema or dialysate leakage, postoperative sepsis, peritonitis, hemoperitoneum due to impaired host defenses, uremic coagulopathy, and protein depletion.[1,6,7] The smaller abdominal incision obtained by suturing and using fibrin glue at the trocar incision sites decreases the incidence of peritoneal fluid leakage, and early dialysis resumption obviates the need for temporary hemodialysis.[3,6] Early return to CAPD has varied from 1 to 14 days.[1–5,8–11]

Address correspondence to:
Jennifer F. Ha, MBBS (Hons)
Department of General Surgery
St John of God Hospital
12 Salvado Road
Subiaco, Western Australia 6008
Email: jenha81@yahoo.com.au

Key Words: Laparoscopic cholecystectomy, management, peritoneal dialysis

CASE

A 54-year-old woman receiving CAPD for chronic renal failure due to multiple myeloma (in remission) presented for an elective LC because of symptomatic cholelithiasis. Her medical history included hypothyroidism secondary to total thyroidectomy for thyroid cancer.

A 10-mm supra-umbilical port was inserted, and the other three 5-mm ports were inserted under direct videoscopic control along the right costal margins. A cholangiogram was obtained, and the cholecystectomy was performed. The ooze from the gallbladder bed was diathermied, and Floseal and Tisseel (Baxter, McGraw Park, IL) fibrin glue was applied to seal the peritoneum. The peritoneum was closed with Vicryl (Ethicon, a Johnson & Johnson Company, Somerville, NJ) sutures and Tisseel.

On the second postoperative day, her CAPD was resumed at four 1.5-L exchanges per day. The initially blood-tinged effluent improved with time, and she tolerated this well and was discharged on the fourth postoperative day.

DISCUSSION

CAPD is a simple and easy technique in terms of insertion and maintenance of access route and allows for gentle fluid shifts, in contrast to hemodialysis, in

patients with end-stage renal disease.[12] Postoperative sepsis and incisional hernia of the abdominal wound were found to occur in 2.5% to 11% of patients after laparotomy.[9] In open cholecystectomy, morbidity is 4.5% (compared with 1%–3% in LC), and mortality is 1.6% to 26% in patients undergoing abdominal surgery, attributed to sepsis, hyperkalemia, and bleeding.[3,13] Laparotomy involves a large abdominal incision and may require removal of the catheter or at least temporary interruption of CAPD to prevent dialysate leakage.[7,9] Dialysate may dissect through tissues denuded of peritoneum, and CAPD may disseminate contamination throughout the peritoneal cavity.[7]

The advantages of LC over open cholecystectomy have been well documented and include reductions in operative time, postoperative pain, postoperative pulmonary dysfunction, postoperative recovery time (which may be prolonged to 6 weeks), and surgical morbidity, as well as improved cosmesis.[1–5,9–11] The laparoscopic approach avoids the creation of a laparotomy wound, which may cause significant morbidity and delay in the resumption of CAPD.[3,4] It is associated with minimal breaching of the peritoneum, reducing the risk of postoperative leakage of dialysis fluid; therefore, CAPD can be resumed in the immediate postoperative period with less chance of fluid leakage (7%–27% in traditional surgery) or peritonitis.[8,9] Compared with the open procedure, LC avoids problems such as poor wound healing, development of hernia, and higher rates of wound infection.[1,4,8] It is also believed that laparoscopy may reduce the absolute risk of the occurrence of postoperative adhesions.[9] All of these factors reduce treatment costs by decreasing the total duration of hospital stay and by avoiding the need for perioperative hemodialysis, which costs the patients in terms of burden to their lifestyle and appointments at dialysis centers, typically 3 times a week.[1,3,6,9–11]

Patients with end-stage renal disease are often at an increased risk for perioperative complications and would benefit from a less invasive surgical technique such as laparoscopy.[2,4,13] Peritoneal thickening and adhesions secondary to chronic dialysis, as well as recurrent episodes of dialysis-related peritonitis, are thought to have the potential to impede laparoscopic surgery, increasing the risk of conversion to an open procedure.[1,4,5,8,14] Intraperitoneal adhesions due to CAPD may not interfere with LC, as they are usually confined to the peritoneal catheter sites.[8,10] Contraindications to LC reported in the literature include major abscesses and peritonitis with extended adhesions because there may be extensive and dangerous dissection.[9] There is a 0.4% incidence of postoperative bleeding after LC in general.[11] Uremic platelet dysfunction is thought to contribute to hemoperitoneum in some CAPD patients, and preoperative correction may reduce the incidence of post-LC bleed.[11] The use of Floseal reduces coagulopathy in these patients.

The CAPD catheter has been found to be an ideal conduit to achieve intraperitoneal insufflations of carbon dioxide, which may reduce the risk of trocar injuries to bowel or vascular structures.[4,8,9] While the risk of bacterial introduction by the insufflation apparatus and contamination of the antimicrobial filter is low, the use of an antimicrobial filter has been advocated to further reduce this risk.[4] Although the CAPD catheter may be an ideal conduit to create pneumoperitoneum, it does not allow intra-abdominal visualization for safe introduction of the first trocar; therefore, an open technique is still advocated to avoid injury.[8]

CONCLUSION

Dialysis should be maintained before surgery because it allows the first postoperative dialysis treatment to be delayed for a few days and the initial stages of healing to proceed unimpeded without the stress of abdominal distension by dialysis infusion.[7] It may also ameliorate defects in thrombocytic function to aid hemostasis during operations.[7,13]

Surgery may require temporary interruption of CAPD. Hence, suturing the peritoneum and fascia is believed to provide an adequate seal at the port sites, and glue will reinforce it further, allowing for rapid resumption of postoperative CAPD.[4] Drains should be removed before dialysis is resumed or avoided, as dialysate leakage may impede effective dialysis.[7] By itself, CAPD will assist in draining abdominal debris with each exchange.[7] Chronic ambulatory peritoneal dialysis is often reinstated at varying intervals, depending on the opinions of the treating team.[6] It may be resumed immediately if abdominal wall integrity is maintained.[2,5,9] Minimal interruption to CAPD in patients undergoing LC is possible.[1–5,8–11] Some authors[2,7,10,11] reinstituted it with decreased volume of dialysate exchange and increased frequency in the first few postoperative days (day 3 by Speck et al[2] and Breyer and Chaudhry[10]).

CAPD is not a contraindication for LC. It can be safely and successfully performed in this patient population without significant morbidity, and it has the advantage of allowing continued CAPD.

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