

The evolution and evaluation of laparo-endoscopic single site (less) cholecystectomy without general anesthesia

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Introduction: Laparo-Endoscopic Single Site (LESS) surgery, laparoscopy undertaken through a single small incision at the umbilicus, reduces the need for general anesthesia and, thereby, the use of regional anesthesia has been explored as an alternative. This study illustrates the evolution and progression of our journey with LESS cholecystectomy without the administration of general anesthesia.

Methods: Evolution of Approach: Initially, spinal anesthesia was administered, with a complete motor block, and a single 3-trocar port was placed through a 12 mm incision at the umbilicus. This approach required adjunctive sutures into the gall bladder to facilitate exposure even with a 5 mm deflectable tip laparoscope. We began to rely on epidural anesthesia and progressively improved the regimen and noted increased peritoneal space and decreased diaphragmatic excursion. We evolved to use a single 4-trocar port and, with this, 2 graspers for retraction; adjunctive sutures became superfluous. The necessary "critical view" became clearer. We currently use epidural anesthesia utilizing 2% lidocaine and 1% bupivacaine. Sedation is achieved with propofol, midazolam, or dexmedetomidine, as requested. We use intraperitoneal irrigation with dilute bupivacaine solution to minimize shoulder pain.

Evaluation of Current Approach: We approached patients with chronic cholecystitis or symptomatic cholelithiasis and BMI <35 kg/m² for LESS cholecystectomy with epidural anesthesia. Blood loss, operative time, complications, and length of stay were evaluated. Preoperatively and 14 days postoperatively, outcome and symptom resolution were scored. Exclusion criteria included pregnancy, or documented contra-indications for epidural catheter placement. Patients were followed postoperatively; using a Likert scale from 1 (worst)-10 (best), they scored their pain, satisfaction, cosmesis, and symptom resolution. Median (Mean ± Standard Deviation) data are reported.

Results: 20 patients underwent LESS cholecystectomy with epidural anesthesia. In the recovery room and through discharge, all patients denied nausea or vomiting, hypotension, neurologic deficits, pruritis, palpitations, drowsiness, or "hangover" from anesthesia. Immediate postoperative pain and discomfort were minimal and well tolerated. The umbilical incisions healed without apparent scar. The patients scored "Satisfaction" as 10 (10±0.6), "Cosmesis" as 10 (10±0.8), and perioperative "Pain" as 5 (5±3.1). When compared to patients undergoing LESS cholecystectomy with general anesthesia, patients experienced significantly less pain with an average pain score of 4.4 while patients in the general anesthesia group had an average pain score of 6.3 (p=0.018), on postoperative day one. On postoperative days six and seven and at the one and three month follow up visits, the reported pain scores for both groups were low and not significantly different. All patients returned to full activities by 2 weeks. Cholecystectomy was significantly less expensive when undertaken via LESS with epidural anesthesia (\$22,508 vs. \$33,483 for LESS cholecystectomy with general anesthesia, p=0.002). LESS cholecystectomy with epidural anesthesia was less expensive than cholecystectomy with general anesthesia in every category measured: supplies, anesthesia, case-level, and pharmacy.

Conclusion: In selected patients, LESS cholecystectomy with epidural anesthesia can be undertaken safely with clinical outcomes equivalent to LESS cholecystectomy with general anesthesia. Patient satisfaction and cosmesis are particularly prominent. This approach is warranted in avoiding the ill effects of general anesthesia and in patients wanting to maintain control through their operative experience. This approach also provides better pain control in the immediate postoperative period and on postoperative day one compared to general anesthesia. LESS cholecystectomy with epidural anesthesia is the most cost effective with the least resource consumption. We recommend LESS cholecystectomy with epidural anesthesia for select patients. LESS cholecystectomy can be undertaken safely avoiding the adverse effects of general anesthesia.

Biography

Sharon B. Ross completed her General Surgery residency at the University of South Florida, College of Medicine, Department of General Surgery and was later awarded the prestigious HPB/Advanced Gastrointestinal Surgery and Minimally Invasive Surgery Fellowship at USF/Tampa General Hospital. She then completed an Endoscopic Gastroenterology Fellowship at the Division of Digestive Disorders & Nutrition, Department of Medicine, University of South Florida. She is currently the Director of Minimally Invasive Surgery, Director of Surgical Endoscopy, Founder & Director of the FHT Women in Surgery Initiative at Florida Hospital Tampa and the Program Director/Chair of the 2010, 2011, 2012 and the upcoming Annual International Women in Surgery Career Symposium. She was one of the first surgeons in the United States to undertake Laparo-Endoscopic Single Site (LESS) surgery, and continues to develop new techniques and instrumentation to improve its safety and application. As a thought leader in American medicine, she continues to push the envelope in the advancement of Minimally Invasive Surgery.

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