

Laparo-Endoscopic Single Site (LESS) Cholecystectomy with Regional Anesthesia

Rachel Karlnoski PhD^{1,2}, Devanand Mangar MD^{1,2}, Enrico Camporesi MD^{1,2}, Alexander Rosemurgy MD², Sharona Ross MD²
¹Florida Gulf-to-Bay Anesthesiology, Tampa General Hospital, Tampa Florida
²University of South Florida, Department of Surgery, Tampa Florida

BACKGROUND

Laparo-endoscopic single site (LESS) surgery is a novel procedure that requires a single incision in the umbilicus. Besides approaching a “no scar” surgery, LESS offers the potential advantages of decreased postoperative pain and shortened hospitalization^{1,2}. Our hospital offers regional anesthesia (RA) as an option for intraoperative anesthesia when undergoing LESS surgery for cholecystectomy. We report our experience with RA in 8 patients that have elected to undergo LESS surgery.

METHODS

In August 2009, we began to utilize RA for LESS surgery. We accepted patients with chronic cholecystitis with a BMI of less than 35 kg/m², no cardiopulmonary disease and a normal coagulation profile. Patients received a combination of 20mL of 2% lidocaine plus 20mL of 1% Ropivacaine via an epidural catheter at a thoracic level and duramorph 0.1mg plus bupivacaine 3.5 mg in a spinal block. All patients had the epidural position confirmed with fluoroscopy and contrast injected. In addition to the spinal/epidural anesthesia, patients were lightly sedated with dexmedetomidine, midazolam or propofol. Pneumoperitoneum was established with CO₂ at a maximum intra-abdominal pressure of 10-15 mm Hg and the diaphragm was irrigated with 500 to 1000 mL bupivacaine (0.15-0.3 mg/mL) to reduce shoulder pain caused by pneumoperitoneum if the patient complained.

We report the fluoroscopic confirmation of epidural placement, prophylactic drugs given for nausea, vomiting, pain and anxiety, and the volume/dose of irrigated bupivacaine. Adverse events were assessed and included symptoms related to the pneumoperitoneum, such as shoulder pain, headache, nausea, discomfort, symptoms related to the anesthetic approach, such urinary retention, pruritus, neurologic sequelae, nausea and vomiting, surgical conversions from 1 port to multiple ports to open approach and anesthetic conversions from epidural anesthesia to general anesthesia. Post-operative pain in the PACU (recorded every 10 minutes), length of PACU stay, and operative time are also reported.

RESULTS

Patient characteristics are shown in Table 1. Three out of eight patients were male. The average age was 54.9 ± 9.4 years and the average BMI was 26.8 ± 5.6 kg/m². Radiological confirmation showed epidural placement to be at a level of T8/9 in 6 out of 8 patients, T6/7 in one patient and T5/6 in one patient. Of the 8 patients, one experienced postoperative urinary retention and discomfort, one experienced intraoperative vomiting and one experienced postoperative nausea and vomiting. There were no surgical or anesthetic conversions. The average postoperative pain (recorded every 10 minutes in PACU) was 1.5 on a visual analog pain scale. The average operative time was 137 minutes and the average PACU time was 113.3 minutes. A summary of prophylactic and anesthetic medications used for each patient are listed in Table 2.

Table 2. Summary of Medications Administered for LESS Surgery

Patient #	Prophylaxis for N/V and pain	Anxiolytics/ twilight sedation
1	Zofran 4mg Zantac 50mg	dexmedetomidine 0.05 µg/kg/hr Torabol 30mg Versed 1mg
2	Fentanyl 150 µg Zofran 4 mg + 8mg in PACU Zantac 50 mg	dexmedetomidine 0.05-0.2 µg/kg/hr
3	Zofran 4 mg Zantac 50 mg Reglan 10mg	dexmedetomidine 0.2-0.4 µg/kg/hr Propofol 130mg
4	Zofran 4mg Zantac 50 mg Reglan 10 mg Fentanyl 150 µg	dexmedetomidine 0.3-0.6 µg/kg/hr Propofol 50mg
5	Zofran 4mg	dexmedetomidine 0.5 µg/kg/hr
6	Zofran 4mg Zantac 50mg	dexmedetomidine 0.7-1.0 µg/kg/hr
7	Fentanyl 50µg	dexmedetomidine 0.5 µg/kg/hr
8	Fentanyl 100 µg Zofran 4mg Morphine 10mg	Versed 6 mg Propofol 70 mg

Table 1. Patient Characteristics

Gender (male/female)	3/5
Age (yr)	54.9 ± 9.4
BMI (kg/m ²)	26.8 ± 5.6
Operative Time (min)	136.6 ± 34.6
PACU Recovery Time (min)	113.3 ± 77.4
Postoperative Pain	1.3 ± 2.3
Surgical Conversions	None
Anesthetic Conversions	None

CONCLUSION

Preoperative anxiety and fear have been linked to refusal of certain types of anesthesia, intra and post operative pain, and other unfavorable psychophysical reactions. In this selected patient population, LESS cholecystectomy with epidural anesthesia was completed with minimal adverse events, no surgical or anesthetic conversions, minimal post-operative pain and therefore, appears to be a safe alternative to traditional general anesthesia. In order to further investigate the feasibility and safety of performing LESS foregut surgery in adult patients that are anesthetized with regional anesthesia versus general anesthesia, we have designed an IRB-approved prospective randomized study to evaluate intraoperative and postoperative adverse events.

REFERENCES

- Hodgett, S.E., et al., Laparoendoscopic single site (LESS) cholecystectomy. J Gastrointest Surg, 2009. 13(2): p. 188-92.
- Teixeira, J., et al., Laparoscopic single-site surgery for placement of adjustable gastric band-a series of 22 cases. Surg Obes Relat Dis, 2009.