

A Prospective Evaluation of Spinal/Epidural Block as an Alternative to General Anesthesia for Laparoscopic Appendectomy at a Tertiary Care Hospital

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ABSTRACT

Background: Appendectomy is one of the most frequently performed surgical procedures worldwide. Laparoscopic appendectomy (LA) became a popular surgical procedure recently, now accounting for 38.1% of all appendectomies. This study was conducted to evaluate Spinal/epidural block as an alternative to general anesthesia for laparoscopic appendectomy.

Materials and Methods: This study comprised 100 subjects who underwent abdominal laparoscopic surgery, out of which 50 were administered spinal anaesthesia (Group 1) while the remaining 50 underwent general anaesthesia (Group 2) for appendectomy. In the L1-L2 intervertebral area, SA was injected using a 24FG or 25FG lumbar puncture needle. Five percent Xylocaine was administered in doses of 1.6 to 1.8 mL (2 mg/kg), or 3 to 5 mL of Sensorcaine (Bupivacaine HCl 5 mg + sod.chl. 8 mg/mL) was used in patients whose surgeries were anticipated to last more than thirty minutes. Comparison of the results was done.

Results: In the SA group, 30 patients were females and 20 were males. In the 2nd group, there were 25 males and 25 females. Hypotension requiring support was recorded in 33 patients of group 1. 19 subjects of group 1 experienced neck or shoulder pain. Headache was observed 36 subjects of group 1.

INTRODUCTION

Appendectomy is one of the most frequently performed surgical procedures worldwide.¹ Laparoscopic appendectomy (LA) became a popular surgical procedure recently, now accounting for 38.1% of all appendectomies.^{2,3} Fewer wound infections and hospitalization days, less postoperative pain, faster recovery and better cosmetic results are the accepted advantages of LA compared to open conventional appendectomy.⁴⁻⁸

Laparoscopic appendectomy is performed under controlled ventilated general anesthesia (GA) with endotracheal intubation in order to prevent aspiration, abdominal and/or respiratory discomfort, and hypercapnia due to carbon dioxide pneumoperitoneum.⁹⁻¹² The development of laparoscopic surgery

Urinary retention was evident in only 2 subjects of group 2. Compared to patients under GA, a notably smaller number of patients had one or more vomiting episodes after surgery. The prevalence of vomiting was higher among subjects of group 2.

Conclusion: Spinal/epidural anesthesia is effective and safe in ASA I healthy patients undergoing LA.


Keywords: Spinal Anaesthesia, General Anaesthesia, Laparoscopic Appendectomy.

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has revolutionized surgical procedures and thus has influenced the practice and techniques of anesthesia. Laparoscopic surgeries are normally performed under endotracheal general anesthesia to prevent aspiration and respiratory embarrassment secondary to induction of pneumoperitoneum. Recent evidence suggests that regional anesthesia has a significant role in the care of patients undergoing laparoscopy.¹³ There are many published reports of laparoscopic cholecystectomy and inguinal hernia repair under segmental thoracic spinal anesthesia and epidural anesthesia.¹⁴⁻¹⁷ Hence, this study was conducted to evaluate Spinal/epidural block as an alternative to general anaesthesia for laparoscopic appendectomy.

MATERIAL AND METHODS

This study comprised 100 subjects who underwent abdominal laparoscopic surgery, out of which 50 were administered spinal anaesthesia while the remaining 50 underwent general anaesthesia for appendectomy. In the L1-L2 intervertebral area, SA was injected using a 24FG or 25FG lumbar puncture needle. Five percent Xylocaine was administered in doses of 1.6 to 1.8 mL (2 mg/kg), or 3 to 5 mL of Sensorcaine (Bupivacaine HCl 5 mg +

sod.chl. 8 mg/mL) was used in patients whose surgeries were anticipated to last more than thirty minutes. For five minutes, a head-down tilt of 10 to 20 degrees was maintained. T4–T5 was the segmental level attained to allow for the epigastric port to be introduced. Blood pressure, SpO₂, SpCO₂, heart rate, and patient anxiety were all tracked for the patient. Anxiety in the patient was defined as anxiety that made it necessary to convert from SA to GA in order to finish the surgery.

Table 1: Gender-wise distribution of subjects.

Gender	Group 1 (spinal anaesthesia)	Group 2 (general anaesthesia)
Males	20	25
Females	30	25
Total	50	50

Table 2: Spinal Anaesthesia Related Complications

Complications	Spinal anaesthesia (n=50)	General anaesthesia (n=50)
Perioperative		
Neck/shoulder pain	22	-
Hypotension	33	-
Anxiety	05	-
Stomach distension	00	28
Postoperative		
Vomiting	19	34
Abdominal pain treated with oral analgesic	43	00
Urinary retention	04	02
Headache	36	00
Port site infection	11	01

RESULTS

In the SA group, 30 patients were females and 20 were males. In the 2nd group, there were 25 males and 25 females. Hypotension requiring support was recorded in 33 patients. 19 subjects experienced neck or shoulder pain. Headache was observed 36 subjects of group 1. Urinary retention was evident in only 2 subjects of group 2. Compared to patients under GA, a notably smaller number of patients had one or more vomiting episodes after surgery.

DISCUSSION

With recent technical advances, acute appendicitis is more commonly performed under laparoscopy than by open laparotomy. Laparoscopic appendectomy (LA) has shown to have considerable advantages over open appendectomy; such advantages include less postoperative pain, better cosmetic results, a shorter hospital stay, and a lower complication rate.¹⁸ However, LA has been routinely performed under general anaesthesia with endotracheal intubation despite the several disadvantages of general anaesthesia compared to regional anaesthesia, including hemodynamic instability, postoperative nausea and vomiting (PONV), increase in the requirement for

postoperative analgesia, complications related to intubation or extubation, and a sore throat postoperatively.^{19,20}

The world literature until about 5 years ago suggested only GA as the anesthetic option for abdominal laparoscopic surgery, and it is only recently that reports of laparoscopic surgery being performed with select patients under spinal or epidural anaesthesia have started to appear.²¹⁻²⁴ Hence, this study was conducted to evaluate Spinal/epidural block as an alternative to general anaesthesia for laparoscopic appendectomy.

In this study, in the SA group (Spinal anaesthesia), 30 patients were females and 20 were males. In the 2nd group, there were 25 males and 25 females. Hypotension requiring support was recorded in 33 patients of group 1. 19 subjects of group 1 experienced neck or shoulder pain. Headache was observed 36 subjects of group 1. Urinary retention was evident in only 2 subjects of group 2. Compared to patients under GA, a notably smaller number of patients had one or more vomiting episodes after surgery. The prevalence of vomiting was higher among subjects of group 2.

Erdem VM et al²⁵ compared spinal/epidural anaesthesia (SEA) and general anaesthesia (GA) during LA with respect to perioperative and postoperative adverse events and postoperative pain. Fifty

patients, aged 18-65, who underwent LA, were randomly allocated to two groups: the GA (n = 25) and SEA (n = 25) groups. Perioperative and postoperative adverse events, postoperative pain level, and patient satisfaction were compared between the groups. None of the patients needed conversion to an open procedure or conversion from SEA to GA. In the SEA group they encountered shoulder pain in 6 (24%) patients, abdominal discomfort/pain in 4 (16%) patients, anxiety in 4 (16%) patients, and hypotension in 2 (8%) patients intraoperatively. Also, post-spinal headache was observed in 5 (20%) patients in the SEA group. Postoperative right shoulder pain was significantly higher in the GA group compared to the SEA group (32% vs. 8%; p = 0.037). In the SEA group the incidence of urinary retention and in the GA group the incidence of postoperative nausea and vomiting (PONV) was higher, but these differences were not statistically significant. The postoperative surgical pain level was significantly lower in the SEA group (p < 0.001). they concluded that spinal/epidural anesthesia is effective and safe in ASA I healthy patients undergoing LA. Less postoperative pain, PONV and shoulder pain are the advantages of SEA compared to GA. Uzman S et al²⁶ assessed the feasibility, efficacy, and side effects of combined spinal-epidural anesthesia (CSEA) in LA. Thirty-three American Society of Anesthesiologist (ASA) physical status classification grade I patients underwent LA under CSEA. CSEA was performed using the needle-through-needle technique at the L3–L4 interspace. Preoperative and postoperative adverse events related to CSEA, patient satisfaction, and postoperative pain levels were recorded. LA under CSEA was performed successfully in 33 patients (84.6%). Peroperatively, right shoulder pain was observed in 8 patients (24.1%), abdominal discomfort in 6 (18.2%), anxiety in 5 (15.2%), hypotension in 2 (6.1%) and nausea-vomiting in 1 (3%). In the first 24 hours after LA, headache, urinary retention, right shoulder pain, and postoperative nausea/vomiting (PONV) occurred in 18.1%, 12.1%, 9.1%, and 0% of patients, respectively. In the first 6 hours postoperation, no patients had operation-site pain that required analgesic treatment. Thirty-one patients (94%) evaluated their satisfaction with the procedure as good or moderate. They concluded that CSEA is an efficient and suitable anesthesia technique in LA for ASA physical status classification grade I healthy patients. CSEA is associated with good postoperative pain control and the absence of PONV and intubation-associated complications.

CONCLUSION

Spinal/epidural anesthesia is effective and safe in ASA I healthy patients undergoing LA.

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