Case Report

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Thoracic epidural anesthesia for gas-free trans-umbilical single port laparoscopic cholecystectomy: a case report

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ABSTRACT

Laparoscopic cholecystectomy (LC) is usually performed under general anaesthesia (GA). With the advancement of surgical and anaesthetic technique, there were many LC have been successfully performed under epidural anaesthesia in recent years. Surgeons in our hospital have performed gas-free trans-umbilical single port laparoscopic cholecystectomy since 2015. However, the description of thoracic spinal epidural anesthesia (TEA) for gas-free trans-umbilical single port laparoscopic cholecystectomy has not been reported yet. The goal of anesthetic management in gas-free trans-umbilical single port laparoscopic cholecystectomy procedures includes achieving an adequate level of sensory blockade without any respiratory compromise, providing good postoperative pain relief, and mild pain at early ambulation. Epidural anaesthesia fulfils all the mentioned criteria and can contribute to quick recovery and thus has been suggested to be a suitable alternative to general anaesthesia for laparoscopic surgeries. We present a case of the successful application of the thoracic epidural anaesthesia combined with laryngeal mask for gas-free trans-umbilical single port laparoscopic cholecystectomy and postoperative pain.

Keywords: Epidural anesthesia, Laparoscopic cholecystectomy

INTRODUCTION

Laparoscopic cholecystectomy (LC) is usually performed under general anesthesia (GA). With the advancement of surgical and anesthetic technique, there were many LC have been successfully performed under epidural anesthesia in recent years. Surgeons in our hospital have gas-free trans-umbilical performed single laparoscopic cholecystectomy since 2015. However, the description of thoracic epidural anesthesia (TEA) for gastrans-umbilical single port laparoscopic cholecystectomy has not been reported yet. The goal of anesthetic management in gas-free trans-umbilical single

port laparoscopic cholecystectomy procedures includes achieving an adequate level of sensory blockade without any respiratory compromise, providing good postoperative pain relief, and mild pain at early ambulation.

CASE REPORT

A 53-year-old man (weight 75 kg, height 178 cm) with gall-stone and chronic cholecystitis was admitted in our hospital for elective gas-free trans-umbilical single port laparoscopic cholecystectomy. He had a history of frequent pain at the right hypochondrial region with

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ultrasonography-documented calculi in the gallbladder for 2 years. His routine investigations were within normal range. Both his chest X-ray and electrocardiogram were normal. On patients' arrival at the operation room, an intravenous (IV) cannula was secured on the right forearm. And then routine monitoring, namely electrocardiogram, noninvasive blood pressure, and pulse oximetry (SpO₂), all were recorded at 5 minutes intervals. The initial blood pressure (BP) was 120/58 mmHg and the heart rate (HR) was 80 beats/min, oxygen at 5L/min through a facemask was commenced. Ringer lactate (15-20 ml/kg) was infused before giving epidural anesthesia. With the patient at the right lateral decubitus position, TEA was performed with 20-G epidural catheter inserted 4cm in the cephalad direction from T8/T9 successfully. Then the patient was placed in the supine position. A test dose of 3 ml of 2% lidocaine was injected through the epidural catheter. There was no evidence of intravascular or intrathecal injection up to 5 minutes, an additional 10 ml 0.5% ropivacaine was injected. Fifteen minutes later, sensory (pinprick) blockade was established from T4 to L1 and motor block (modified Bromage scale 1-inability to raise extended legs/can bend knee) was achieved, which was accepted to allow surgery. At this point, the BP was 110/54 mmHg and the HR was 54 beats /min. Before surgery was started, another 5ml 0.5% ropivacaine was injected through epidural catheter; intravenous midazolam 2 mg and sufentanyl 15 µg were given. During this period, the patient received Ringer's lactate solution. The patient was mildly sedated and breathed spontaneously without difficulty. Then laparoscopic cholecystectomy was started. A 2.5 cm incision was made paraumbilicus, and a gasless pneumoperitoneum device was inserted into the peritoneum with 250 ml gas insufflated. But the relaxation of the patient's abdominal musculature was poor, which resulted in difficulties in performing the operation. Considering one of the most important problems of this laparoscopic cholecystectomy procedure under epidural anesthesia maybe the inadequate relaxation of abdominal musculature, so laryngeal mask intubation was facilitated with 1.5 mg/kg propofol IV and 0.3 mg/kg rocurronium IV successfully as prepared. The patients' BP and HR decreased abruptly to 75/51mmHg and 56 beats /min, respectively. The BP and HR increased to 108/60 mmHg after 6mg ephedrine IV. Then, the maintenance of anesthesia was with propofol 4 mg/ (kg.h) and remifentanil 0.05 ug/ (kg. min). Ventilation was controlled with a tidal volume of 8-10 ml/kg and ventilatory rate of 12 breaths/ min, the tidal volume and ventilatory rate were adjusted to make sure the PetCO₂ within 37-40 mmHg.

Laparocsopic cholecystectomy was continued with satisfaction after the placement of laryngeal mask and the hemodynamics of the patients were stable. The gallbladder was removed uneventfully, and the total surgical time was 57 minutes. Fifteen minutes before the surgery was over; the anesthetist injected 0.25%

ropivacaine 10 ml with 10 μg sufentanyl through the epidural catheter.

After completion of the surgical procedure, the epidural catheter was removed and the patient was shifted to the post-anesthesia care unit (PACU) for further observation. The patient remained hemodynamically stable and comfortable during the 1 hour at PACU. The patient was followed up for 2 days and was asked to complete a simplified questionnaires (Table 1), which was developed for patients to evaluate comments about this operation. The postoperative visual analogue scale (0-10 VAS score) for pain was evaluated at 24 hours, 48 hours on postoperative 2 days, the patient just felt mild pain (VAS = 2, at rest; VAS = 3, on moving) at 24 hours after surgery. And no pain (VAS = 0, at rest, VAS = 1, on moving) at 48 hour postoperatively.

Table 1: Questionnaire form for patients.

Questionnaire
How was the operation comfort?
Very well
Well
Moderate
Poor
Are you happy after this operation?
Yes
No
Do you advise this operation to your friends?
Yes
No

DISCUSSION

Gas-free trans-umbilical single port laparoscopic cholecystectomy is a new technique which is carried out by Hu Hai, the director of cholelithiasis department of Shanghai East Hospital. Compared with conventional laparoscopic cholecystectomy, this new technique is unique in that it just has one paraumbilical incision and has no carbon dioxide pneumoperitoneum, which has less effect on the patient's hemodynamicas and complications caused by CO2 pneumoperitoneum.

In Ross's studies, he and his colleagues stated that epidural anesthesia may be a preferable alternative to general anesthesia for patient undergoing laparoendoscopic single site (LESS) cholecystectomy with no operative or anesthetic conversions. Considering the successful use for laparoscopic cholecystectomy under epidural anesthesia and the advantages of epidural anesthesia. We choose the thoracic epidural anesthesia alone for the patient undertaking the gas-free transumbilical single port laparoscopic cholecystectomy initially. But we can learn from our case that one of the most important problems of this surgery under thoracic epidural anesthesia is inadequate relaxation of abdominal musculature, in addition, gas-free trans-umbilical single

port laparoscopic cholecystectomy is an immature technique, which need resolve it by combining with laryngeal mask intubation. However, epidural-general anesthesia may offer us better hemodynamic stability, mild pain at early ambulation, and better patient satisfaction, lesser doses of drugs being used in thoracic segmental block than general anesthesia. We can also learn from this case that the patient reported a satisfactory response to postoperative pain for laparoscopic cholecystectomy procedures undertaken with thoracic epidural anesthesia combined with laryngeal mask.

Several studies reported lower levels of postoperative pain for laparoscopic procedures undertaken with spinal or epidural anesthesia compared with general anesthesia. The potential mechanism for pain reduction with regional anesthesia maybe residural analgesia and/or preemptive analgesia, a pharmacologic blockade of the somatosensory pathways before surgical incision. 2

CONCLUSION

Thoracic epidural anesthesia combined with laryngeal patient who mask anesthesia can possibly offer undergoing gas-free trans-umbilical single laparoscopic cholecystectomy lesser doses of anesthetics being used, better postoperative analgesia, better hemodynamic stability, mild pain at early ambulation, and better patient satisfaction. Considering it is a new and immature technique and the relaxation of abdominal musculature is of high quality. We need combine with larygeal mask intubation to provide a satisfactory condition for the operation, but epidural anesthesia alone maybe an appropriate and safety choice for people undergoing gas-free trans-umbilical single port laparoscopic cholecystectomy in the near future and this should be examined in future studies.

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REFERENCES

- 1. Yuksek YN, Akat AZ, Gozalan U, Daglar G, Pala Y, Canturk M, et al. Laparoscopic cholecystectomy under spinal anesthesia. Am J Surg. 2008;195(4):533-6.
- Ross SB, Mangar D, Karlnoski R, Camporesi E, Downes K, Luberice K, et al. Laparo-endoscopic single-site(LESS) cholecystectomy with epidural VS. general anesthesia. Surg Endosc. 2013;27:1810-9.
- 3. Hajong R, Khariong PD, Baruah AJ, Anand M, Khongwar D. Laparoscopic cholecystectomy under epidural anesthesia: a feasibility study. N Am J Med Sci. 2014;6(11):566-9.
- 4. Karim HM, Mitra JK. Laparoscopic cholecystectomy under epidural anesthesia: a feasibility study. N Am J Med Sci. 2015;7(3):129-30
- Lee JH, Huh J, Kim DK, Gil JR, Min SW, Han SS. Laparoscopic cholecystectomy under epidural anesthesia: a clinical feasibility study. Korean J Anesthesiol. 2010;59(6):383-8.
- 6. Imbelloni LE, Fornasari M, Fialho JC, Anna SR, Cordeiro JA. General anesthesia versus spinal anesthesia for laparoscopic cholecystectomy. Rev Bras Anestesiol. 2010;60:217-22.
- Yousef GT, Lasheen AE. General anesthesia versus segmental thoracic or conventional lumbar spinal anesthesia for patients undergoing laparoscopic cholecystectomy. Anesth Essays Res. 2012;6:167-73.
- 8. Tzovaras G, Fafoulakis D, Georgopoulou S, Pratsas K, Stamatiou G, Hatzitheofilou C. Laparoscopic ventral hernia repair under spinal anesthesia: a fesibility study. Am J Surg. 2008;196:191-4.
- Kuramochi K, Osuga Y, Yano T, Momoeda M, Fujiwara T, Tsutsumi O et al. Usefulness of epidural anesthesia in gynecologic laparoscopic surgery for infertility in comparision to general anesthesia. Surg Endosc. 2004;18:847-51.

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