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Case report

Case report and review of literatures: Thoracic epidural as a sole anaesthetic technique in laparoscopic myomectomy

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Abstract Thoracic epidural anaesthesia for elective laparoscopic myomectomy is good alternative to general anaesthesia and seems to be effective technique, with minimal hemodynamic consequences and excellent patient satisfaction and no post-operative complications provided patient cooperation, minimal inflation pressure and mild table tilt. We present here one case of laparoscopic myomectomy under thoracic epidural anaesthesia in patient with relative contraindication to general anaesthesia.

1. Introduction

Laparoscopic cholecystectomy with pneumoperitoneum has traditionally been performed under general anaesthesia, however, owing in part to the advancement of surgical and anaesthetic techniques; many laparoscopic surgeries have been successfully performed under the spinal anaesthetic techniques [1–3]. In the recent years, advanced laparoscopic surgery has targeted older and high risk sick patients for general anaesthesia. In these patients, regional anaesthesia offers several advantages with improved patient satisfaction. Generally, spinal anaesthesia has lower postoperative mortality and fewer complications than general anaesthesia, so spinal anaesthesia seems more suitable for the minimally invasive laparoscopic surgery [4]. Thoracic epidural anaesthesia provides a segmental, temporary motor and sensory block that advantages over lumber spinal anaesthesia, such as reducing morbidity and mortality by reducing cardiac and splanchnic sympathetic activity [5]. In addition, the level of anaesthesia achieved by a spinal anaesthetic is too low to perform laparoscopic surgery in some cases, due to pooling of drug in the sacral region by lumbar lordosis [6]. Although further evaluation and comparison will be required, segmental thoracic epidural anaesthesia in laparoscopic surgery offers some benefits over lumbar spinal anaesthesia: the avoidance of urinary retention and the benefit of a daytime surgery setting [7].

However, this anaesthetic approach requires a relaxed and cooperative patient, low intra-abdominal pressure (IAP) to reduce shoulder pain, postoperative nausea, vomiting and ventilator disturbances, and reduced table tilt with a precise and gentle surgical technique [7].

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2. Case report

A 34 years old female patient American Society of Anaesthesia class II, presented with large uterine intramural leiomyoma, with history of subarachnoid haemorrhage managed medically in March 2014 at our hospital with no neurological consequences.

Neurological consultation asked from the same treating physician and he recommended regional anaesthesia as the optimum method of choice for the patient.

After obtaining informed written approval and high risk consent from the patient, with normal partial thrombin time, prothrombin time and international normalized ratio, she was scheduled to undergo laparoscopic myomectomy. The patient was informed about the advantages and disadvantages of epidural anaesthesia and possible conversion to general anaesthesia and similarly the surgeon was prepared for conversion to open procedure in case of need.

On the patient's arrival at the operating room, noninvasive monitoring (electrocardiogram, noninvasive BP monitoring, and pulse oximetry), and a peripheral venous infusion of 20 ml/kg lactated ringer to prevent hypotension during anaesthetic procedure were started 20 min before anaesthesia. Oxygen 3 L/min was applied via a nasal cannula.

Patient was placed at sitting position and under full aseptic precautions; local infiltration with xylocaine 1% at the desired level (T9–T10) was done close down to the ligamentum flavum, and an epidural block catheter (Perifix®, B. Braun, Melsungen, Germany) was placed at the 10th thoracic interspace using a 17 gauge Tuohy needle and a paramedian approach. The epidural space was identified by the 'loss of resistant' technique and the tip of the catheter was advanced 5 cm cephalad beyond the tip of needle. The anaesthetic solution was prepared with xylocaine 2%, plus epinephrine (1: 200,000).

After negative aspiration, 3 ml of the solution was administered as a test dose. After 2 min there was no evidence of intravascular or subarachnoid injection, an additional 8 ml of Bupivacaine 0.5% was injected over 5 min period with 100 μg fentanyl, and an additional 2 ml of the solution was administered incrementally to reach the desired level of segmental block. Upper and lower levels of sensory and motor block were assessed by a pinprick test and the Bromage scale respectively. After confirmation of adequate level of anaesthesia (T4–T12), 10 mm umbilical portal entry and pneumoperitoneum created at 7 mmHg and maintained at 8 mmHg inflation pressure, two inguinal 5 mm and one suprapubic 5 mm ancillary ports were applied. With mild degree of table tilt myomectomy was performed smoothly and the patient was all through the procedure hemodynamically stable and awake.

Intraoperative anxiety was treated with midazolam 1–2 mg, and hypotension with ephedrine 5–10 mg, all as intravenous boluses as required.

The average duration of the surgery was 2 h and the procedure went smoothly with no complications.

3. Discussion

Epidural anaesthesia was considered safe for laparoscopic cholecystectomy without associated respiratory depression as the respiratory control mechanism remains intact to allow the patients to adjust their minute ventilation. Moreover, the respiratory changes are less evident in awaken patients under regional anaesthesia and patients maintain an unchanged end tidal carbon dioxide [8]. The central neuraxial anaesthesia has been found beneficial usually in patients with significant medical diseases when low intra-abdominal pressure and less degree of patient tilt during surgical procedure are used [5]. The shoulder pain, secondary to diaphragmatic irritation from carbon dioxide pneumoperitoneum, is incompletely alleviated using epidural anaesthesia alone and extensive sensory block from T4 to L5 is needed for the laparoscopic procedure. Many researchers have observed that laparoscopic cholecystectomy performed under regional analgesia is advantageous due to reduction in surgical stress response, and avoidance of airway instrumentation and lower incidence of deep vein thrombosis are few other advantages.

Van Zundert et al. [2] noted shoulder and neck pain in 2 of their 6 patients operated under epidural anaesthesia. Minai et al. attributed the high incidence of shoulder pain to the physical and chemical stimulations of the diaphragm by pneumoperitoneum [9]. In our case, there was no shoulder pain was observed which could be attributed to low intra-abdominal pressure of 8 mmHg combined with minimal table tilt. At IAP < 15 mmHg, venous return is augmented as blood is squeezed out of splanchnic venous bed with increased cardiac output which also increased secondary to peripheral vasoconstriction due to hypercapnia [10]. During our case, the hemodynamic changes were also minimal due to preloading with 20 ml/kg of ringer lactate over 20 min, low intra-abdominal pressure and minimal table tilt.

There was no postoperative nausea and vomiting reported which could be attributed to antiemetic prophylaxis with multi-modal treatment of patient with high risk for post-operative nausea and vomiting, avoidance of hypotension, adequate pain control and avoidance of postoperative parenteral opioid medication.

On this basis and after review of literatures this case report was aimed to evaluate the efficacy of epidural anaesthesia for laparoscopic myomectomy as a part of ongoing large randomized clinical study on safety of thoracic epidural anaesthesia for high risk surgical cases, lack of complications and morbidity in previous researches encourage us to share our experience of thoracic epidural anaesthesia for laparoscopic myomectomy.

At the time of discharge of this case, the patient was being satisfied with the anaesthetic technique, good postoperative pain control and minimal nausea and vomiting.

Bejarano et al. used spinal anaesthesia with midazolam sedation for laparoscopic ventral hernia repair and concluded that spinal anaesthesia is feasible and well tolerated [11]. Van Zundert et al. stated that segmental spinal anaesthesia can be used safely for patients with impaired organ function [2]. Lau et al. also quoted that laparoscopic hernia can be performed successfully under spinal anaesthesia [12]. However, epidural anaesthesia is not free from complications, dural puncture and sympathetic denervation of high regional block which may lead to bradycardia, hypotension and decreased cardiac output. The vigilant monitoring and of course high technical skill of anesthesiologist needed to perform thoracic epidural safely, are essential for prevention and treatment of complications.

In this case report, our results are related to many factors, we used a low CO_2 pressure 8 mmHg, our surgeon was experienced and operative time was relatively short.

4. Conclusion

This case report has demonstrated that laparoscopic myomectomy and post-operative analgesia are feasible under thoracic epidural anaesthesia. This approach should be considered as a valid option for patients with multiple fibroids who are poor candidates for general anaesthesia due to cardiopulmonary problems as well as for patients with other contraindications for general anaesthesia.

Thoracic epidural anaesthesia for elective laparoscopic myomectomy seems to be effective technique, with minimal hemodynamic consequences and excellent patient satisfaction and no post-operative complication in the form of pain, nausea and vomiting, provided patient cooperation, minimal inflation pressure and mild table tilt.

Further study on large scale is recommended to evaluate the efficacy and safety of this technique to be conducted in high risk surgical patients. Close monitoring and follow-up are crucial to ensure patient safety with thoracic epidural anaesthesia.

Conflict of interest

None declared.

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