Laparoscopic Cholecystectomy Under Epidural Anesthesia in Patients with Chronic Respiratory Diseases

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Abstract

Laparoscopic cholecystectomy (LC) has become firmly established as a procedure of choice for gallstone disease. The procedure usually necessitates general anaesthesia and endotracheal intubation to prevent aspiration and respiratory embarrassment secondary to the induction of pneumoperitoneum. There is a paucity of data in the literature on the procedure being performed under regional (epidural) anaesthesia, especially in patients with coexisting pulmonary disease who are deemed high risk for general anaesthesia.

Keywords: *anesthesia, patients, chronic respiratory diseases, Laparoscopic cholecystectomy.*

Introduction

Single physiological parameter that defines this syndrome is: Limitation of expiratory airflow. [6] It is because of the combination of small airway inflammation and parenchymal destruction. Several anatomical lesions contribute to airflow limitation, including the loss of lung elastic recoil and fibrosis and narrowing of small airways, both of which are likely to cause fixed airflow limitation. [7] It adversely affects both the ventilation/perfusion (V/Q) matching and mechanics of the respiratory muscles. In the patients with advanced CoPD, the CoMBINATION. of V/Q mismatch decreased gas transfer and alveolar. Hypoventilation ultimately leads to respiratory failure. Multiple pathogenetic mechanisms contribute to the development of CoPD among which the most important risk factor is cigarette smoking, which can affect the lungs by a variety of mechanisms.[8] However, recently, the role of genetic factors has also been implicated, with the finding that a genetic variant (FAM13A) is associated with the development of CoPD in the CoPD gene study [9]

Diagnosis and Assessment

Surgeons and anesthesiologists should have clearly defined criteria for COPD regarding the assessment of perioperative and postoperative risks, surgical outcome and postoperative ventilation requirement. Airflow limitation should be assessed according to the reduction in forced expiratory volume in 1 s (FEV1), Providing anesthesia to severe cases of lung disease poses some challenges especially when the patients are taken up for laparoscopic surgery. An underlying knowledge of the cardiovascular and respiratory pathophysiology is of paramount importance for providing safe anesthesia in these patients because all these changes get aggravated in patients with COPD because intraoperative and postoperative complications occur more commonly than in those without the disease and can lead to prolonged hospital stay and increased mortality

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Pathophysiological Effects

During Laparoscopy

In physiological effects of pneumoperitoneum, Carbon dioxide is shown to be affected by raising the intra-abdominal pressure (IAP) above the venous pressure which prevents CO_2 resorption leading to hypercapnia. Respiratory effects include the changes in pulmonary Function during the laparoscopic surgery in the form of a reduction in lung volumes, decrease in pulmonary compliance and increase in peak airflow pressure. Increased IAP shifts the diaphragm cephalad and reduces diaphragmatic excursion, resulting in the

early closure of smaller airways, leading to intraoperative atelectasis with a decrease in functional residual capacity. Additionally, the upward displacement of diaphragm leads to the preferential ventilation of nondependent parts of lungs, which results in ventilation-perfusion (V/Q) mismatch with a higher degree of intrapulmonary shunting

Methodology

I report MY preliminary experience with LC using epidural anaesthesia in patients with chronic obstructive pulmonary disease I performed LC in 2o patients (12 man and 8 women), with a median age of 56 years (range, 38-74), under thoracic epidural anaesthesia over an 2 years period. All patients were ASA grade III/IV and the mean FEB1/FVC was o.52 (range, o.4-o.68), due to chronic asthma (6 cases) and COPD (14 cases). They were admitted a day prior to surgery for pulmonary function tests, nebulisers, and chest physiotherapy. An epidural catheter was introduced at T1o/11 intervertebral space, and a bolus of o.5% Bupivacaine was administered. Depending on the patient's pain threshold and the segmental level of analgesia achieved, incremental doses of 2 ml of o.5% Bupivacaine along with boluses of intravenous 5o MIC fentanyle was given to each patient. The patients were breathing spontaneously. No nasogastric tube was inserted, and a low-pressure (1o mmHg) pneumoperitoneum was created. LC was performed according to the standard technique

Results and Discussion

All the patients tolerated the procedure well and made an uneventful postoperative recovery. Median operating time was 5o min; average length of hospital stay was 2.5 days (range, 2-4). The epidural catheter was removed the morning after the operation. only 3 patient required postoperative opioid analgesia. 3 patients complained of persistent shoulder tip pain during surgery and required intraoperative analgesia (fentanyl) . There was no change in the patient's cardiorespiratory status, including PO2 and pCO2, and no complications occurred either intra- or postoperatively

Conclusion

LC can be performed safely under epidural anaesthesia in patients with severe CoPD. Intraoperative shoulder tip or abdominal pain does not seem to be a major PRoMBLEM and can be effectively controlled with small doses of opioid analgesia.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Aldewaniya teaching hospital and all experiments were carried out in accordance with approved guidelines.

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