

Perioperative management of a scoliotic patient posted for laproscopic cholecystectomy-challenge for anaesthesiologist

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ABSTRACT

Scoliosis is a complex deformity of the spine resulting in lateral curvature and rotation of the vertebrae as well as a deformity of the rib cage. Patients with ankylosing spondylitis or severe kyphosis or scoliosis represent a challenging group to anesthesiologists and laparoscopic surgeons since these diseases are associated with difficult intubation, restrictive ventilatory defects, and cardiac problems. Here, we describe a case of 51-year-old male with severe thoracolumbar scoliosis posted for laparoscopic cholecystectomy.

Keywords: Cholecystectomy, Laparoscopic, Perioperative, Scoliosis

INTRODUCTION

Scoliosis is a complex deformity of the spine resulting in lateral curvature and rotation of the vertebrae as well as a deformity of the rib cage. There is usually secondary involvement of the respiratory, cardiovascular and neurologic systems. Its reported prevalence in the general population varies from 0.3–15.3%. However, the prevalence is less than 3% for curves more than 10° and less than 0.3% for curves more than 30°. It is more common in adolescents and has a female to male ratio of about 3:1.

Laparoscopic cholecystectomy is a standard operation for benign gallbladder disease. Patients with ankylosing spondylitis or severe kyphosis or scoliosis represent a challenging group to anesthesiologists and laparoscopic surgeons since these diseases are associated with difficult intubation, restrictive ventilatory defects, and cardiac problems.

Laparoscopic cholecystectomy is usually performed under general anesthesia but considerable difficulties in anesthetic management are encountered during laparoscopic surgery; for example, hemodynamic instability may develop in patients with cardiopulmonary dysfunction due to pneumoperitoneum and

position changes during the operation. Nonetheless, regional anesthesia can be considered as a valid option for patients with gallbladder disease who are poor candidates for general anesthesia due to cardiopulmonary problems.

CASE REPORT

A 51-year-old male weighing 70 kg with severe thoracolumbar scoliosis was admitted with complaints of intermittent right upper quadrant pain for 2 years with an acute onset fever, jaundice, and pruritus for 15 days. On Examination Pulse-96/min, regular, normo-volumic, Blood pressure: 100/70 mmhg, SPO₂-87% on room air, RR-24/min, Temp-98°F. Further examination revealed that he was icteric. There were bilateral basal crepitations and rhonchi. Abdominal examination: The abdomen was soft and lax with significant tenderness in the right upper quadrant with positive Murphy's sign. All other physical findings were within normal limits.

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How to cite this article: Vishen VS, Kark Gi. Perioperative management of a scoliotic patient posted for laproscopic cholecystectomy-challenge for anaesthesiologist. Central Journal of ISA 2018; 2(2):72-74.

Airway examination showed mouth opening of two and half fingers, Mallampati grade 3, restricted extension of the neck, thyromental distance of 5 cm. His breath holding time was 12 s. All the features were suggestive of difficult intubation. Spinal examination revealed severe scoliosis of the thoracolumbar spine. Chest X-ray showed scoliosis and tubular heart with Cobb angle of 80°. The Pulmonary Function Test (PFT) showed moderate-to-severe restriction. USG abdomen was suggestive of cholelithiasis. ECG: sinus tachycardia and T-wave inversion in V4 and V5. Echocardiography was normal with an ejection fraction of 55% and no pulmonary arterial hypertension.

ANAESTHETIC MANAGEMENT

The risk of anaesthetic technique and requirement of post-operative intensive care) was explained to patient and his care takers, and the patient was accepted for anaesthesia under ASA grade III physical status with written informed consent.

Patient was shifted to operation theatre and intravenous access was obtained with 18G IV canula. Monitors (ECG, NIPB, SPO₂) were connected and the patient was preloaded with 500 ml ringer lactate Difficult intubation cart was kept ready. Patient was premedicated with Inj. ondansetron 4 mg i.v and inj. Hydrocortisone 100 mg i.v and then the patient was prepared for regional block (subarachnoid block). Intervertebral space was identified by tracing the spine from upwards. Spinal anaesthesia was given with 23 G Quincke spinal needle in L2–L3 intervertebral disc space in sitting position by injecting Inj. Bupivacaine 0.5% 2.5 ml and Inj. Fentanyl 25 ug.

Sensory block was achieved up to T6 & surgery was started. Hemodynamic parameters and saturation were monitored and maintained within normal limits. Intraoperative patient vitals were Heart Rate (HR) = 70–90 bpm, Blood Pressure (BP) 90/60–110/70 mmHg, and Saturation of peripheral Oxygen (SpO₂) = 92–95% (supplemental oxygen 4 L/min). Surgery was completed uneventfully.

Post-operative pain relief was given by injection diclofenac 75 mg intramuscular; patient was monitored and shifted to high dependency unit for further observation and management. Incentive spirometry and chest physiotherapy were continued in the postoperative period. The patient was mobilized on the third postoperative day. She was discharged from the hospital 1 week after the procedure without any complication.

DISCUSSION

Scoliosis is derived from the Greek word meaning ‘crooked’.

The scoliotic spine poses a unique challenge for the anaesthesia provider and may complicate general or regional anaesthesia.

Scoliosis is broadly classified into three categories: congenital, neuromuscular, or idiopathic. Scoliosis is defined as lateral curvature of the >10°. The degree of lateral curvature is determined by the Cobb angle. The severity of compression is directly related to the degree of scoliosis angulations and is determined by measuring Cobb’s angle which is measured between the most tilted vertebral bodies in the coronal plane. A line is drawn parallel to the superior end plate of the cephalad vertebrae with the greatest angulations. A second line is drawn parallel to the inferior end plate of the caudal vertebrae with the greatest angulation. If this angle is 40° the cardiopulmonary function frequently decreases and if 100° it significantly decreases.

Patients with scoliosis suffer from restrictive lung disease which decreases vital capacity, functional residual capacity, tidal volume, and increases respiratory rate. Positive pressure ventilation decreases venous return and along with negative inotropic effect of anaesthetic agents can lead to severe decrease in blood pressure. Coughing and bucking at the end of the surgery may transiently but significantly decreases functional residual capacity, resulting in further ventilation perfusion mismatch and hypoxemia.

The abnormal spine makes intubation and ventilation difficult. Co-existing hypoxemia and pulmonary infection may lead to difficult extubation and prolonged ventilation due to difficulty in aligning the airway. Postoperatively after general anaesthesia, elements of laryngeal incompetence and impaired swallowing further decrease the airway defense mechanisms. All these factors together can lead to delay in extubation and need for postoperative ventilation. So General Anaesthesia is not favoured as a choice of anaesthesia due to difficulty in intubation and post op ventilation, presence of pulmonary infection, poor respiratory reserve and location of the surgery.

The main handicap of regional anaesthesia is decreased success rate due to unsuccessful insertions, multiple attempts, false loss of resistance, failed or inadequate block. The volume of local anaesthetic must be accordingly adjusted. There are reports that in patients with severe curves, hyperbaric solution may pool in the dependent portion of the spine and results in inadequate block. Caution must be advised with regional anaesthesia as neurological anomalies may associate with spinal abnormalities^[1,2,3].

Several advantages of regional anesthesia technique are quicker recovery, decreased post-operative nausea and vomiting, fewer hemodynamic changes, less postoperative pain, shorter hospital stay, early diagnosis of complications, improved patient satisfaction and cost effectiveness. This anesthetic technique requires a cooperative patient, low IAP to reduce pain and ventilation disturbances, gentle surgical technique and a supportive operating room staff^[4,5].

CONCLUSION

Subarachnoid block with a proper planning and meticulous approach can be a useful technique in patients with thoracolumbar scoliosis resulting in a successful outcome.

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