

## Pneumothorax during laparoscopic cholecystectomy: A rare but fatal complication

Sir,

A 30-year-old ASA physical status I female weighing 60 kg presented to us for laparoscopic cholecystectomy. The patient received general anesthesia with standard drugs. Postintubation patient was put on ventilator to achieve normocapnia (end-tidal CO<sub>2</sub> 35-40 mmHg). After 30 minutes of incision when gall bladder had been separated from the fossa, there was a sudden rise in the heart rate 110/minute, decrease in oxygen saturation to 85%, decreased breath sounds with hyper-resonant note on percussion on the right side and increased airway pressure to 30-35 mmHg suggestive of pneumothorax. Patient was put on 100% O<sub>2</sub> and shifted onto manual ventilation immediately. Keeping a differential diagnosis of bronchospasm and pneumothorax in mind, muscle relaxation was enhanced; patient was nebulised with bronchodilators (salbutamol through the endotracheal tube), corticosteroids and trachea was suctioned. But all these did not improve the clinical scenario. Since surgery was near completion, it was decided to proceed with surgery. Any injury to the diaphragm was ruled out and the pneumoperitoneum was deflated.

Subsequently, oxygen saturation (increased to 95%), other parameters (end-tidal CO<sub>2</sub> and PR decreased to 40 mmHg and 90/min, respectively) and clinical findings (improved air entry on the right side) improved. Her trachea was extubated and she was shifted to SICU. Postoperative CXR confirmed right-sided pneumothorax. The patient was put on parenteral antibiotics, oxygen by facemask and close monitoring in the intensive care unit. After confirming fully expanded lung with clear costophrenic angles on CXR, the patient was discharged on 4th postoperative day.

The known risk factors for a pneumothorax in laparoscopic surgery include a long surgical time (>200 mins), end-tidal CO<sub>2</sub> 50 mmHg, old age and unskilled surgeons.<sup>[1,2]</sup> This can occur spontaneously, rupture of emphysematous bullae due to barotraumas, due to direct injury to the diaphragm during dissection of gall bladder off the liver bed or leak of carbon dioxide through the congenital weakness in the diaphragm leading to pneumomediastinum and subsequent spontaneous pneumothorax.<sup>[3,4]</sup> Pneumothorax during laparoscopic cholecystectomy is a potentially life-threatening complication, and can exaggerate physiological

effects of intraperitoneal carbon dioxide insufflation (decreased functional residual capacity, increased airway pressure, hypercarbia and hypotension), especially in elderly patients with poor cardio respiratory reserve.<sup>[3,4]</sup> A high index of suspicion is required for prompt diagnosis and treatment of such a complication.

If detected early during the surgery, pneumoperitoneum should be deflated, a chest tube should be inserted and then the surgery can be completed. In the presence of a tension pneumothorax, needle thoracostomy in second intercostals space followed by placement of a chest tube should be done. Since, carbon dioxide is highly soluble in blood and thus gets quickly absorbed from the pleural cavity after abdominal desufflation.

Since our patient was relatively stable, and it was detected toward the end of procedure it was prudent to withhold any invasive modality. The patient was immediately given 100% oxygen, shifted from ventilator to hand bag ventilation. The surgeons were also immediately informed of the possibility and were asked to finish the procedure as soon as possible.

In conclusion, although spontaneous pneumothorax during laparoscopic cholecystectomy is rare, it can be life threatening. A high index of suspicion, communication and collaboration with surgeons, intensive monitoring and prompt management helped in a successfully managing the case.

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