

Case Report

Anesthetic Consideration of Intraoperative Pneumothorax in Laparoscopic Surgery

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ABSTRACT

Intraoperative pneumothorax is a rare but potentially lethal complication during general anesthesia. History of lung disease, barotrauma, and laparoscopic surgery increase the risk of developing intraoperative pneumothorax. The diagnosis during surgery could be difficult because the signs are often nonspecific. We report a case of a middle-aged women who developed right pneumothorax during an elective laparoscopic hysterectomy. Intraoperative resuscitation, management of pneumothorax and ventilatory management of this case.

Conclusion

It is important to have a high index of suspicion to early detect and treat such complication. In addition, good communication with the surgeon and use of available diagnostic tools will aid in the proper management of such cases.

KEYWORDS: General anaesthesia, laproscopic surgery, pneumothorax.

INTRODUCTION

Pneumothorax is among, one of the most fatal intraoperative complications. Early diagnosis and prompt treatment required. Detecting pneumothorax during conduct of general anaesthesia is difficult, as the changes in hemodynamic parameters are non-specific.¹ Various factors are there, that contribute to development of pneumothorax in intraoperative period.^{2,3} Patient related factor include emphysematous disease, pleural blebs, congenital defect in diaphragm^{1,4} Surgical factor is laproscopic surgery (0.01-0.4%) itself⁵⁻⁷ Intrathoracic surgery, CVP placement and rare factors include airway manipulation.^{2,3,8,9} In some case pneumothorax by laparoscopic port insertion in upper abdominal surgery, unrecognized endobronchial intubation. Recognition of pneumothorax can be difficult during general anaesthesia, and some cases are only identified postoperatively.¹⁰

CASE REPORT

A 42year old female patient (weight 70kg) was planned for total laproscopic hysterectomy, Patient having no any comorbidity, all routine blood investigation normal, Chest X ray & ECG done no any significant changes, 2d echo done which shows EF-55% with reduced LV compliance. Patient was advised 8-hour NBM, Informed and written Consent & IV cannula taken, patient shifted to OT, Pre op vitals taken pulse-110/min, BP-130/80mmhg, -99% on RA, IV fluids started, Pre medication Inj.Ondansetron, Glycopyrrolate, Midazolam & fentanyl given. Pre oxygenation done with 100% o2 for 3min. Induction done with inj. Propofol & sch, intubation with portex cuffed ETno.7, conformation by auscultation, B/L air entry checked then fixed at 22. NDMR inj. atracurium loading dose given. Analgesic drug inj. paracetamol given, patient put on VCV mode of ventilator, TV 450ml, F-14, PEEP-4. Maintenance done with O2+N2O+sevoflurane+atracurium. Lithotomy and

Trendelenburg Position given. Air entry check by auscultation. Airway pressure was maintained under 18 mmHg. The surgeon then proceeded with the peritoneal insufflation and placement of the ports. Round ligament coagulation started, within few minutes patient saturation started to drop reach up to 80% & Heart rate 120 beat per minute, at that point, we asked the surgeon to halt the surgery and deflate the abdomen and we started the emergency management. Patient put on 100% oxygen; N2O & Inhalation stopped. Bilateral air entry checked by auscultation. After 5 min patient BP raised up to 180/110mmhg, NTG drip started, saturation still 84%, sudden frothing coming out from ET tube, B/L craps +, suction done, BP was 140/92mmhg, NTG stopped, after 5 min pulse was fall down atropine 1 amp. iv stat given, still drop down up to 40/min, repeat atropine given. BP fall down reach up to 80 systolic, inotropic injection started, patient shifted to ICU.

In ICU Patient put on IPPV mode of ventilator with inotropic support, in auscultation- rt side air entry decreased, bed side Chest X ray done which shows Right pneumothorax with left mediastinal shift, ICD insertion done by general surgeon, In ICD bag continuous air bubbling seen. Saturation improved up to 97%, rt side air entry improved, mild crepitations present B/L, BP - 110/60mmhg, inotropic support reduced. After that patient put on SIMV mode, maintain saturation. Inotropic support stopped after 12hr of ICU admission, after 24hr of ICU admission patient extubated successfully with ICD in situ. HRCT thorax done which shows basal atelectasis and mild pneumothorax. Patient shifted to higher center, where conservative treatment given for 5 days followed by removal of ICD beg and then discharge successfully. The patient was seen on a follow-up visit, was hemodynamically stable without clinical or radiological evidence of recurrence of the pneumothorax.

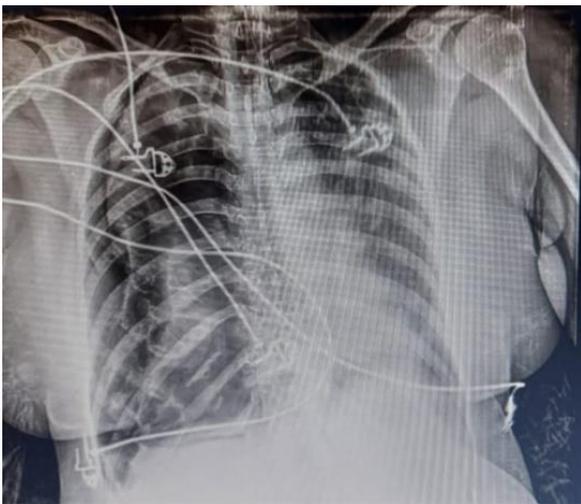


Figure 1: Chest X ray shows Right pneumothorax

DISCUSSION

During conduct of general anaesthesia, pneumothorax is rare, It can be life threatening condition if it turns into tension pneumothorax.¹¹ Positive pressure ventilation during general anaesthesia is the major risk factor by causing barotrauma.^{12,13} Patient related factor include emphysematous bulla on smaller blebs, which can get ruptured with positive pressure ventilation.¹⁴ So it is recommended to avoid positive pressure ventilation and PEEP in patient with known emphysematous disease.¹⁵ One lung ventilation either planned or accidental can pose additional risk in these kinds of patients.¹⁶ Surgical factors include laproscopic surgery itself. Factors that contribute is leak of gas from peritoneal cavity to pleural cavity via either congenital or iatrogenic defect in diaphragm.^{17,19}

Laposcopic surgery has negative effect on respiration, which will be add on by pneumothorax. So, it will be a dangerous situation.^{17,18} Other rare contributing factors include airway manipulation either noninvasive via laproscopy in which cause is still unclear, or invasive in which leakage of air through paratracheal tissues into pleural space.^{8,20,21}

Regardless of the cause of pneumothorax, early recognition and management is crucial for preventing unfavorable outcomes, in our case initial management of any deterioration in vital signs should go simultaneously while diagnosing the main problem. The initial steps of management include immediate cessation of the surgery, deflation of the abdomen while the anaesthetist is running the crisis algorithm. The patient is switched to manual ventilation with 100% oxygen once airway patency is confirmed. These were the steps taken in our case. The definitive management of pneumothorax, in the absence of tension pneumothorax, is the insertion of an intercostal tube. In our patient, once the vital signs were stabilized and the diagnosis of pneumothorax was confirmed, afterwards, lung expansion was confirmed by taking another chest radiograph. After rechecking that all the vitals are stable and the patient was switched back to mechanical ventilation without difficulty.

CONCLUSION

Intraoperative pneumothorax is a rare but potentially lethal complication that can be happen due to congenital defect of diaphragm, rupture of bulla, endobronchial intubation, during creation of pneumoperitoneum. Early recognition and management are crucial for preventing life-threatening complications. The availability of diagnostic tools, such as portable radiography machines, are valuable tools to facilitate early diagnosis and management of such complication.

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