

Hemoptysis: A Postoperative Pulmonary Complication after Neurosurgery Causing Unilateral Lung Collapse

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Abstract

Post-operative pulmonary complications are one of the important causes of morbidity and mortality in Neurosurgical patients. The common pulmonary complications include pneumonia, postoperative atelectasis, respiratory failure, pulmonary embolism and neurogenic pulmonary edema. Prompt and timely management decreases the morbidity and mortality. Post-operative pulmonary complications are usually associated with poor neurological outcome. Prevention, timely recognition and appropriate prompt management are of paramount importance for the Neuroanesthesiologists and Neurosurgeons. Here, we report a case of hemoptysis in post-operative period causing hypoxemia and blood causing lung collapse in a patient, which was managed in time before it could have led to catastrophic events.

Keywords: Hemoptysis; Lung collapse; Neurosurgery; Pulmonary complications

Introduction

Pulmonary complications are one of the major causes of morbidity and mortality in Neurosurgical patients in post-operative period. The common pulmonary complications in neurosurgical patients include pneumonia, postoperative atelectasis, respiratory failure, pulmonary embolism and neurogenic pulmonary edema. Prevention and timely management of these complications can help to decrease the morbidity and mortality associated with pulmonary complications [1,2]. Development of postoperative complications may also be associated with poor neurological outcome in many situations [3].

Therefore, prevention, timely recognition and appropriate management of these have great importance for the Anesthesiologists and Neurosurgeons. Following is the case of postoperative hypoxemia has been discussed which occurred due to hemoptysis and fresh blood causing lung collapse in a patient, which was diagnosed and managed in time before it could have led to catastrophic events.

Case Report

A 45-year-old male, 60 kg, diagnosed as a case of hydrocephalus was scheduled for elective Ventriculoperitoneal shunt procedure. His medical history revealed pulmonary tuberculosis four years back. The patient had taken complete Anti tubercular treatment for it. There was no history of hemoptysis in past. All routine investigations were within normal limit. He had no other associated comorbid condition. His recent chest radiograph (Figure 1) and electrocardiograph showed normal study.



Figure 1: Recent chest radiograph.

On the day of surgery, he was premedicated with injection Glycopyrrrolate 0.2 mg, inj, Ondansetron 4 mg, inj. Midazolam 1 mg and injection Fentanyl 2 mcg/kg body weight intravenous (i.v). General anesthesia was induced with inj. Propofol 2 mg/kg i.v and Endotracheal intubation was facilitated with Vecuronium bromide 0.1 mg/kg body wt. Anesthesia was maintained with mixture of nitrous oxide and oxygen mixture (50:50) along with 1% sevoflurane, which was titrated to maintain a mean blood pressure of 60-70 mm Hg, and maintenance dose of vecuronium bromide was administered intermittently for muscle relaxation.

Intraoperative monitoring included electrocardiography, pulse oximetry, end tidal carbon dioxide, noninvasive blood pressure, and central venous pressure monitoring. The patient was stable throughout the procedure. The surgery lasted one hours and the intraoperative course was uneventful. At the end of the surgical procedure, the trachea of patient was extubated in the operating theater after reversal of the residual neuromuscular blockade.

Postoperatively, the patient was conscious, coherent, and well oriented. The patient was shifted to Post anesthesia Care Units (PACU) for postoperative monitoring. After fifteen minutes in PACU, the patient had a bout of cough along with fresh blood and blood clots (Hemoptysis). Patient became drowsy, unresponsive and developed hypoxemia and oxygen saturation decreased from 98% to 60%. Immediately oral suction was done and fresh blood and clots were removed. Trachea of patient was reintubated and airway was secured blood was still coming through endotracheal tube (ETT). Gentle Endotracheal tube suction was again done. Oxygen saturation increased from 60%-90%. Injection Tranexamic acid 1 gm i.v. was given along with injection Vitamin K 10 mg i.v.

On auscultation, sounds were diminished in right supraclavicular, mammary and scapular areas with crepitations present in the corresponding areas. A portable chest radiograph was suggestive of moderate right lung collapse along with infiltrates (Figure 2). The patient remained hemodynamically stable. Gentle sterile endotracheal tube suction yielded thick brown blood clots.

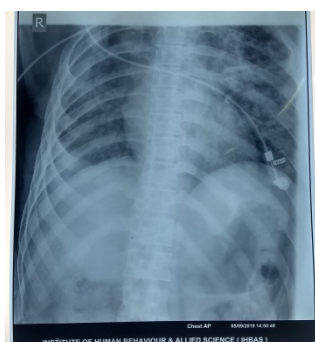


Figure 2: Moderate right lung collapse along with infiltrates.

A sudden improvement was seen in the respiratory movement. Air entry improved on auscultation of right lung. Oxygen saturation rose to 95%. Repeat chest radiograph was taken after 12 hrs showed increased expansion of the right lung (Figure 3).



Figure 3: Increased expansion of the right lung.

Mechanical ventilation with supplemental oxygen was continued, and the patient was kept on fentanyl infusion. The patient was hemodynamically stable and maintained oxygen saturation.

Bronchodilator nebulization, repeated suctioning, and chest physiotherapy were done to clear tracheobronchial tree. The patient was extubated the following day after T-piece trial, regaining protective airway reflexes and a normal arterial blood gas profile. On post extubation, the patient was able to maintain saturation to 95% on an oxygen mask, and on chest auscultation, bilateral equal air entry and normal vesicular breath sounds were heard. She was shifted to Neurosurgery ward two days later with better chest X-ray.

Discussion

Acute pulmonary complications are common in the postoperative and ICU setting, especially in neurosurgery cases. It is prudent to be aware of and make certain simple strategies as part of the routine protocol of care in ICUs as well as ward patients, so as to reduce the various pulmonary complications in the postoperative period [2,3]. Most common causes of acute pulmonary collapse include endobronchial intubation or blockage of the tube by secretions and blood. Atelectasis due to blood clot and mucus plug as a cause of hypoxemia is uncommon and may be potentially fatal [4,5]. Our report highlights the onset of hemoptysis in post-operative period causing hypoxemia associated with unilateral right lung collapse due to blood clot.

In our patient, the initial clinical presentation included sudden onset of hemoptysis causing hypoxemia with diminished chest movement and diminished breath sound on the right side and chest radiograph suggestive of moderate right lung collapse and infiltrates. Before going ahead with fiberoptic bronchoscopy, after gentle sterile suction through ETT blood clots were aspirated, and the patient improved clinically and radiologically, so fiberoptic bronchoscopy as planned earlier was not performed. While lung collapse and intraoperative hypoxemia have been reported previously, few involve mucous plugging, blood clots and atelectasis [6-9].

Conclusion

A case of successful re-expansion of lung following drainage of blood clots causing right lung collapse has been reported. Although fiberoptic bronchoscopy is a gold standard to aid diagnosis and management, a trial of postural drainage and suctioning may be life-saving.

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