Case Report

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Removal of Bronchial Thrombus and Perioperative Anesthetic Management in a Cardiac Case: A Case Report

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Abstract

A 63-year-old male with a history of Rheumatic heart disease with post-balloon mitral valvuloplasty (BMV) presented with a carcinoid tumor of the right lower lobe, posted for lobectomy plus regional lymph node resection. Anesthetic challenges and management of this patient is well described here. A rare post-operative complication i.e, blood clots in the bronchus, resulting in hypoxia and desaturation was found during the extubation time. Handling such complications with a bronchoscope is also discussed in this case report.

Keywords: Rheumatic Heart Disease; Pulmonary Complications; Bronchoscopy.

Abbreviation: PET-CT: Positron Emission Tomography and Computed Tomography
2D ECHO: 2 Dimensional Echocardiography
HRCT: High Resolution Computerized Tomography
ECG: Echocardiogram
TMT ECG: Treadmill Test ECG
RMI: Reversible Myocardial Ischemia
BMV: Balloon Mitral Valvuloplasty
PFT: Pulmonary Function test
DLT: Double lumen endotracheal tube
ABG: Arterial Blood Gas
TEA: Thoracic Epidural Analgesia

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INTRODUCTION

Bronchopulmonary carcinoid tumors are rare, slow growing, malignant neuroendocrine tumors arising from Enterochromaffin cells lining of the aerodigestive tract and account for less than 2% of lung tumors.[1] Management of patients with Rheumatic heart disease and post - BMV posted for non-cardiac surgery involves cardiac assessment for valvular function, residual pathology, infective endocarditis, functional status, risk of bleeding and

to prevent cardiac complications during the intra and post-operative period. High-risk patients can be optimized with preoperative and post-operative cardiopulmonary rehabilitation to reduce their operative risk, frequency of complications, hospital stay and improve post-operative outcomes, including post-operative lung function.[2,3]

CASE PRESENTATION

A 63-year-old male presented with dyspnea on exertion for 5 months, fever, non-productive cough, and loss of appetite for the initial 20 days, and recently had dyspnea of grade III. The patient had an addiction to tobacco chewing for 16 years and is a known case of Rheumatic heart disease and had undergone BMV 10 years back. A HRCT scan of the thorax, revealed a hypodense lesion in the apical segment of the right lower lobe. This was further confirmed by histopathology as carcinoid tumor (Neuroendocrine tumor). On examination, the vitals were all within normal range, and bilateral air entry was present but was decreased on the right infrascapular region, with no remarkable findings in other systems. His routine investigations were normal. TMT was positive for RMI, with no arrhythmia or angina with fair effort tolerance. While Angiography, PFT, and the 6 min walk test were found to be normal. 2D echo showed LVEF-66%, mild MR, AR, moderate MS with MVOA (T)-1.40 cm2, and the digital chest X-ray revealed right lower zone homogenous opacities. For anesthetic purposes, airway, Metabolic equivalent (METS) >4. Predicted Postoperative FEV1 68%, Lee's revised cardiac risk index (RCRI)[4] 0.9-1.3%,VO2 max between 10-20 mL/kg/min was within the normal limits.[5,6] Right lower lobectomy plus regional lymph node resection under General anesthesia with TEA with DLT for one lung ventilation along with invasive monitoring was planned.

The patient was educated for deep breathing, coughing maneuvers, and incentive spirometry after the surgery. After the arrival of the patient in the operation theater, ASA - specific monitors were attached. Induction of anesthesia was done by i.v.propofol and vecuronium bromide after premedication, the left-sided DLT of 39 Fr (Sheridan) was facilitated into the trachea using conventional direct laryngoscopy and positioning was confirmed. Initially, dual lung ventilation was maintained with 50% oxygen: 50% nitrous oxide, and isoflurane with boluses of vecuronium bromide during the chest incision and was continued till the thoracic cavity was opened. Further, single lung intermittent positive pressure ventilation was started and was restricted to the left lung until the right lower lobe and lymph resection was done. Chest tube was also placed. The intra-operative course was uneventful except for there were multiple episodes of desaturation (not below 80% on Fio2 1.0) for which intermittent dual lung ventilation with PEEP was done. At the end of the surgical procedure, reversal of the residual neuromuscular blockade was done. Right upper chest indrawing was noticed on inspection and a dull note was found. There was no air entry on the upper right and lateral side of the chest, and crepitations were found over the basal areas of the lung. The ABG revealed a pH of 7.290, Pco2 of 38.6mm Hg, Po2 of 90.7 mm Hg, and bicarbonate of 18.1 mmol/L. Intravenously steroids and salbutamol puffs were given. The DLT was removed due to suspicion of dispositioning of the tube. But after extubation, the patient developed hypoxemia, and oxygen saturation decreased from 98% to 85% on 100% FiO2. As we had a fiberoptic bronchoscope available in our operation-theater, bronchoscopy was immediately performed. It was found that there was a clot (Fig. 2) present in the right upper bronchus which was removed by suction. The patient improved clinically and radiologically and postoperative ABG was also found to be normal. After 72 hours of surgery, ultrasonography showed minimal to a mild hypoechoic collection with free air in the right pleural cavity, and on the left side minimal pleural effusion was noted. Consecutive chest x-rays till 5th days were done showing an expanded upper lobe with increased radiodensity in the lower right part.

Fiber-optic bronchoscope view showing clot in Right bronchus

DISCUSSION

This patient was a known case of Rheumatic heart disease, post-BMV. To prevent cardiac complications, the goals for anesthetic management were to maintain stroke volume, adequate analgesia, avoidance of drug induced myocardial depression, maintenance of normovolemia, and prevention of increased ventricular afterload.[7] Furthermore, the patient was undergoing major surgery, i.e., lobectomy, which required TEA along with parenteral opioids to provide superior intraoperative and post-operative analgesia in comparison with parenteral opioids. TEA reduces pulmonary morbidity.

In the present case, there were multiple episodes of desaturation intraoperatively during one lung ventilation that might be due to the above mentioned reasons, for which the patient was shifted to dual lung ventilation and PEEP was given. Here, there was a retraction of the right upper chest wall with decreased air entry at the end of the surgery, leading to desaturation and atelectasis of the right upper lobe that was probably due to some obstruction in the bronchus. Fiberoptic bronchoscopy should always be available at the patient's side before extubation and, if needed, bronchoscopy of the remaining segments and suctioning of any foreign body, mucous or clots should be done before extubation. Fiberoptic bronchoscopy is the gold standard to aid diagnosis and management of such complications.[8] For the present case, postural drainage can be done post-operatively on evidence or suggestion of difficulty with secretion clearance and the presence of a foreign body in the airway. Although fiberoptic bronchoscopy is a gold standard to aid diagnosis and management, a trial of postural drainage may be life-saving.[9,10]

In conclusion, the retraction of the right upper lobe is an uncommon post-operative complication after thoracic surgery. A fiberoptic bronchoscope should be available in the operation theater and if such complication occurs, then immediately, bronchoscopy should be performed to locate or remove any foreign body, mucous or clots before the extubation.

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