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Case Report *Volume 6 Issue 1*

Anaesthetic Considerations in Excision of Right Endobronchial Carcinoid Tumour by Posterolateral Thoracotomy

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Abstract

Bronchial Carcinoid tumours are rare to diagnose and need a multidisciplinary approach for treatment. Early excision helps recurrence free period with good prognosis. The Carcinoid syndrome is to be evaluated in these lesions to tailor the plan of treatment. Excision of Lung tumours require one lung ventilation and anaesthesiologist face a challenge to maintain ventilation and oxygenation due to altered physiology related to patient-positioning, one lung ventilation and hemodynamic changes are to be considered. In this case reports we discuss about "The Anaesthetic considerations for bronchial carcinoid tumour excision and emphasising strategies to mitigate Intraoperative Hypoxia during One lung ventilation".

Keywords: Bronchial Carcinoid Tumours; Anaesthesiologist; Posterolateral Thoracotomy; Oxygenation

Introduction

Bronchial Carcinoid tumours are rare slow growing neuroendocrine tumours arising from kulchintsky cells in bronchopulmonary mucosal layers usually presenting as perihilar masses in third to fifth decades of life. These tumours account to 0.5-1% of lung malignancies and are rare to diagnose and treat due to similarity to other lung pathologies.

Carcinoid syndrome is seen in <5% of these tumours and most of them have an indolent course. They may present with symptoms of Lower respiratory tract infections. early diagnosis and excision are important to prevent recurrence.
Anaesthetic management includes detailed evaluation, optimisation with planning and preparedness to manage the case. Goals were to maintain Hemodynamics, oxygenation, Ventilation and adequate analgesia during perioperative period. Extreme vigilance and Preparedness help in mitigating complications and aid in better patient outcome.

Case Report

A 51-year-old female presented with history of Fever for 2 months and Cough for 1 month. The patient was a homemaker who was apparently asymptomatic 2 months ago; then she developed High Grade Fever which was continuous and not subsided by conventional Antipyretics; Cough was not associated with expectoration, shortness of breath, chest pain, Haemoptysis. She had no history of Diarrhoea, Vomiting, Flushing, Bladder and Bowel disturbances. Her past medical

history was normal, and she had undergone Hysterectomy for Uterine fibroids 9 yrs ago under Regional Anaesthesia which was uneventful.

She was 150cm tall and 70 kg with a BMI of 24.2, moderate built and well nourished. She was conscious, coherent, cooperative, afebrile with Pulse rate (PR) 77/min, Blood pressure (BP)180/100mmHg, Room air saturation (SpO2) 99%, Auscultation had normal vesicular breath sounds and normal heart sounds with no murmurs. Airway examination was normal (Mouth opening Adequate with Mallampati grading 2, Normal neck and Spine).

She was diagnosed with Denovo Hypertension and was started on Tab. AMLODIPINE 5mg OD, Tab. TELMISARTAN 40mg OD.

A 6-minute Walk Test was performed. Distance covered was 420m with no functional limitation, all blood investigations were normal.

ECG was normal, 2D echocardiography was normal.
Chest x ray: Elevated right hemidiaphragm with crowded bronchovesicular markings in the right lower lobe.
CT chest: evidence of Heterogeneous enhancing small ovoid nodular lesion in right lower lobe bronchus measuring 8*14mm with mild luminal compromise causing atelectasis of the distal lower lobar segments with ground glass opacity. Right paratracheal cranial lymph node enlarged 15*10mm likely reactive.
PETCT: metabolically active endobronchial mass lesion in right lower lobe and metabolically active enlarged lymph node with mild right pleural effusion.
Bronchoscopy: right lower lobe endobronchial mass lesion with basal segment atelectasis.
Histopathology of Bronchial Biopsy; Well differentiated Neuroendocrine Tumour/ carcinoid tumour.
Pulmonary function test was done to calculate predictive postoperative forced expiratory volume (PPOFEV1) which was 47%. (to estimate lung function after resection of lung segments).
Provisional Diagnosis: 51-year-old female with Right lower lobe bronchial carcinoid tumour with denovo hypertension without carcinoid syndrome.
The patient was posted for right lower lobectomy by posterolateral thoracotomy approach.

Preoperative vitals: GCS 15/15, PR-82/min, BP-170/90mmHg, SPO2-99% on room air, Auscultation of Heart and lungs was normal.

A Thoracic Epidural sited T9-T10 intervertebral space was placed.
Patient was premedicated with Inj. Ondansetron 4mg IV, Inj. Glycopyrrolate 0.2mg IV, Inj. Midazolam 1mg IV, Inj. Remi fentanyl 80 mcg IV

Preoxygenation done with 100% oxygen for 3 minutes.
Induction was done with Graded doses of Inj. Propofol 100+20mg IV, Inj. Lignocaine 60mg IV, after giving Inj. Succinylcholine 100mg IV

Patient was intubated with Left sided double Lumen oral cuffed endotracheal tube of size 32 French using video laryngoscope blade and placement confirmed by auscultation with and without clamping of bronchial and tracheal tubes.

Maintenance done with nitrous oxide+oxygen+sevoflurane 2+2+2%.
Left Radial artery catheterised for arterial blood pressure monitoring.

The surgery was performed in left lateral decubitus position. One lung ventilation was done. After the initiation of one lung ventilation gradual decrease in saturations was noted which did not improve with FiO2 100%, Increasing PEEP. As saturation dropped till 88% with Fio2 100%. Incremental decremental Alveolar Recruitment manoeuvre (automatic through ventilator settings) was performed for 15 seconds two times following which saturations were improved to 97%.

Intraoperative Blood Pressure was optimised by Inj. Nitroglycerine infusion and tapered according to the BP. MAP of 60-70, PR 60-80/min maintained. Analgesia was maintained throughout the surgery by timely Epidural top-ups with Inj. Bupivacaine 0.25% 6ml 3 hourly, Total duration of One lung Ventilation was 4 hrs. A right intercostal drain was put before closure of surgery. prior to extubation ABG (arterial blood gas) was normal, Double lumen Endotracheal tube was replaced with single lumen tube 7.0mm. As PPOFEV1 was above 40% and extubation trial was normal patient was extubated on table.

Postoperative period was uneventful with adequate analgesic and antibiotic supports and was discharged on postoperative day 8.

Discussion

The Carcinoid tumours are neuroendocrine tumours developing from enterochromaffin cells. The site of origin is mostly gut tissue but 70% occur as bronchial carcinoid tumours. The bronchial carcinoids are 0.5-1% of lung malignancies. Types of carcinoid tumours include typical and atypical. Typical type can secrete active substances like kinins, neuropeptides and are known to cause a constellation of symptoms known as carcinoid syndrome. Carcinoid syndrome has flushing of skin, diarrhoea, vomiting, hypertension, bronchospasm. Atypical type are usually slow growing tumours which may metastasise and cause compression symptoms. The bronchial tumours

are usually intraluminal tumour affecting major bronchi. The disease is seen in adult age group with symptoms pertaining to lower respiratory tract infection and is diagnosed based on symptoms and investigations. Confirmed diagnosis is by histopathology of biopsy. The definitive treatment is resection of tumour. The recurrence is less after resection and doesn't require further radiotherapy and chemotherapy.

Anaesthesiologist role starts from detailed evaluation and work up with multidisciplinary team in tailoring the plan of treatment and postoperative care.

As the lobectomy is a long-standing surgery involving one lung ventilation, a thorough respiratory system assessment in physical, functional aspects; cardiopulmonary reserve testing to assess and anticipate the intraoperative and postoperative hemodynamic and maintaining ventilation and oxygenation of the patient.

One lung ventilation needs special airway equipment including double lumen tubes or bronchial blockers and ventilatory management with vigilant monitoring and knowledge on the changes due to one lung ventilation, patient positioning is required.

Management of Hypoxia during One lung Ventilation

In this case as there were gradual desaturations after One Lung Ventilation, the surgery was not stopped and continued with one lung ventilation and checked for ventilation, perfusion, titration of PEEP. as there was further decline to 88% alveolar recruitment strategy was done using incremental decremental method with PEEP of 5-10-15-20-15-10-5 cm of water and 3 breaths given with each change of PEEP value.

Alveolar Recruitment Manoeuvres are employed to open collapsed lung alveoli and use of high PEEP to keep lungs open and restore lung function and decrease ventilator induced lung injury (VILI). It also reduces peak airway pressures, increases PaO2 and decrease dead space during One Lung Ventilation. This technique is of prime importance in thoracic surgeries which have severe derangements in gas-exchange and risk of lung injury.

In case of the patient with carcinoid syndrome, standby medications like octreotide {endocrine genocide}, drugs to treat bronchospasm, hypertension, tachycardia and other complications should be prepared.

In our case the patient was thoroughly pre-evaluated and optimised prior to surgery. The patient was not diagnosed with carcinoid tumour but precautionary measures were taken due to neuroendocrine nature of the tumour.

Absence of carcinoid syndrome though reduced the risk of complications like bronchospasm could not omit the incidence of other complications like hypoxia and hypertension in this case scenario.

The Hypertension during intraoperative period cannot indicate the carcinoid syndrome; as hypertension is a multifactorial disease.

Anaesthesia was planned by thoracic epidural for analgesia, double lumen tube insertion for one lung ventilation, standard ASA grade monitoring and arterial monitoring was done throughout the surgery. Hypoxia was noted and optimised using 100%fio2, PEEP, Recruitment Manoeuvre. Extubation was planned based on PPOFEV1and regular extubation criteria has been followed. More than 40%PPOFEV1 indicates the preservation of lung function postoperatively and have lesser risk of postoperative pulmonary complications like pneumonia, atelectasis or respiratory failure.

Conclusion

This case underscores prompt management of hypoxia during One lung ventilation and maintaining intraoperative blood pressure by thoracic epidural anaesthesia for bronchial carcinoid resection. The lobectomy for lung tumours is mostly an elective procedure giving an adequate window for preop work-up and optimisation.

Anaesthesiologists play a major role in the treatment due to high changes in respiratory, cardiovascular, endocrine system involvement in the disease process intraoperative and postoperative management. Anticipation and preparedness help in mitigating the adverse outcomes and should be practised regularly for a better patient outcome.

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