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Case report: Post operative pulmonary atelectasis – Bronchial adenoma - Rare cause

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Abstract
Atelectasis is one of the most common pulmonary complications seen in the cardiac surgery. However, it resolves with physiotherapy and without further intervention in most of the cases. This is the case report involving atelectasis in the post operative period. Fifty-six years old male with single vessel disease and severe aortic stenosis with moderate aortic regurgitation underwent coronary artery bypass grafting and aortic valve replacement. Subsequently, he developed complete right upper lobe atelectasis during the post-operative period which required maximum intervention such as bronchoscopic intervention and cryoextraction of the bronchial mass prior to extubation. Silent bronchial adenomas may undergo haemorrhagic transformation leading to complete bronchial occlusion and atelectasis.

Keywords: Atelectasis, bronchoscopy, cryoextraction, bronchial adenoma

Introduction

Atelectasis is seen in approximately 30 – 72%% of postoperative chest radiographs after cardiac surgery and is a major contributor to the postoperative respiratory dysfunction and it is a common cause of hypoxemia and impaired gas exchange after cardiac surgery. Nearly, all patients with general anaesthesia develop atelectasis while spontaneously breathing and after muscle paralytics are administered, regardless of the use of intravenous or inhalational anaesthetics. Large atelectasis has been shown in the immediate postoperative period in patients with respiratory distress after cardiac surgery. In an animal study, cardiopulmonary bypass produced large atelectasis with a corresponding increase in intrapulmonary shunt and decrease in PaO2. But, here it is a report of an unusual case of atelectasis during post-operative period due to bronchial adenoma and required active intervention measures including bronchoscopy and cryoextraction of bronchial mass. Silent bronchial adenoma may undergo haemorrhagic transformation and may lead to fatal bronchial obstruction.

Case Presentation

Fifty-six years old male with the known case of hypertension and old ischemic cerebrovascular event had single vessel disease and severe aortic stenosis with moderate aortic regurgitation along with the features of congested heart failure and had no history of smoking and alcohol. On examination, patient had fair general condition, conscious and oriented, afebrile, blood pressure -129/77 mm Hg, pulse rate - 76 bpm and 97% oxygen saturation on room air. On chest auscultation, patient had S1+S2+ along with systolic ejection murmur grade 3/6 @ right 2nd intercoastal space radiating to the carotid and heaving apical impulse, respiratory system – bilateral air entry present with decreased basal breath sounds. On 2D echo, patient found to have moderate concentric left ventricular hypertrophy, mild dilatation of ascending aorta (38mm), regional wall motion abnormality present, global left ventricle hypokinesia, hypokinesia less marked in inferior and posterior segments on the mid level, all apical segments are hypokinetic, left ventricle ejection fraction – 28%, grade II/III left ventricle diastolic dysfunction, left atrium > 18 mm Hg, normal right ventricle systolic function, mild mitral reurgitation, aortic valve - calcified number of cusps not made out clearly, maximum pressure gradient – 82.8 mmHg and mean pressure gradient – 53.5 mmHg across aortic valve, severe aortic stenosis / moderate aortic reurgitation, moderate tricuspid reurgitation with, right ventricle systolic pressure =63 + right atrial pressure, small pericardial effusion which is approximately 3mm laterally 10mm superior to right atrium and inferior venacava is 21 mm in size which showed < 50% inspiratory collapse. On coronary angiography, he had type III left anterior descending vessel with mid 80% stenosis – found to have single vessel disease. On carotid doppler, plaque causing 9% stenosis and 7% stenosis in right and left bulb, normal velocity and pattern of flow seen in bilateral carotid artery. On investigations, patient was found to have serum creatinine in raising trend, NT-pro BNP – 7509 and rest all the investigations are normal. Chest Xray showed enlargement of cardiac size and presence of pulmonary edema and bilateral pleural effusion pre-operatively. Then patient underwent off-pump coronary artery bypass grafting for left anterior descending artery and aortic valve replacement on cardiopulmonary bypass. On the 1st post-operative day, patient found to have right upper lobe atelectasis which is revealed on the chest x-ray. On further intervention like bronchoscopy which showed small clot mass like structure on the anterior segment of bronchus of the right upper lobe which had been removed through the cryoextraction [7].

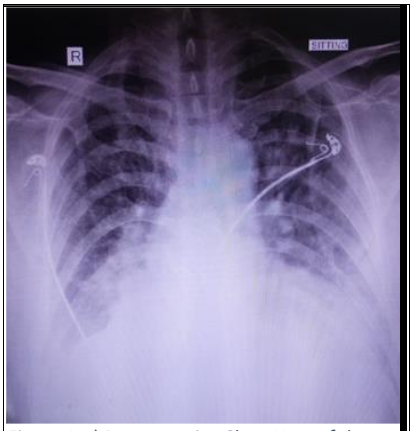

Figure 1-a) Pre-operative Chest Xray of the patient which showed congested chest

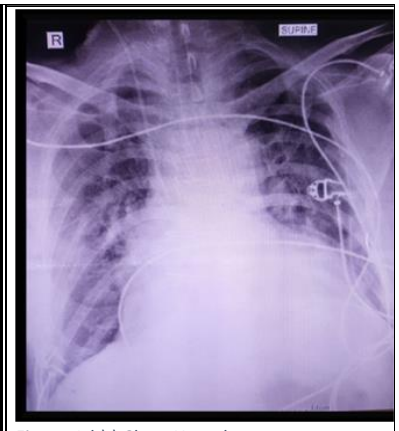

Figure 1-b)) Chest Xray done on postoperative day – 0

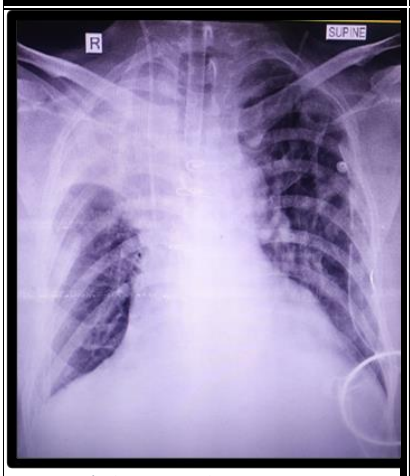

Figure 1-c) Chest Xray done on post-operative day -1 where arrow denotes right upper lobe atelectasis

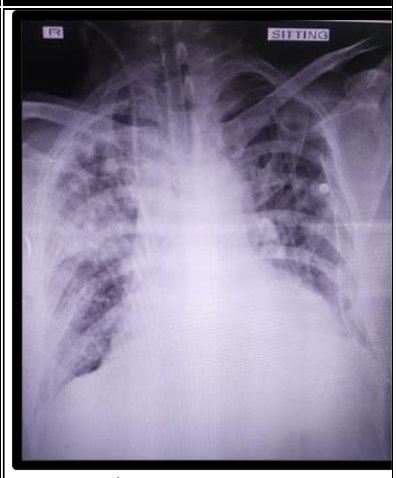

Figure 1-d) *After bronchoscopy, chest got clear after cryoextraction of mass*

And the patient began to manage with the higher antibiotics as he developed fever with the raising trend of total leukocyte counts, serum procalcitonin and deranged liver function test and kidney function test with the normal urine output. As the sputum culture shows the growth of klebsiella, antibiotics were upgraded according to the sensitivity. Since patient was continued to have right upper zone opacities on 5th post operative day, he underwent CT chest which suggestive of organized consolidation in the right upper and lower lobe with atelectatic areas. Also areas of ground glassing seen in both the lungs which may represent pulmonary haemorrhage. But on the repeated bronchoscopy which showed normal left bronchus and abnormal right upper lobe mucosa and bronchoalveolar lavage was done which showed a growth in acetobacter, antibiotics upgraded accordingly. Also the histopathology of bronchial mass showed tissues which are lined by pseudostratified ciliated columnar epithelium with underlying fibromuscular tissue, tiny piece of cartilage with numerous sero-mucinous glands and focal collection of lympho-histiocytic inflammatory infiltrate, lung parenchyma with numerous alveoli and alveolar macrophages dispersed in clusters and scattered singly and no granuloma or malignancy seen which represents the incidental bronchial adenoma. As the total leukocyte count was fluctuating during the entire post-operative course which came down gradually with the normal liver and kidney function test. Then the patient was vitally and haemodynamically stable and got discharged.

Discussion

Post operative atelectasis is the most common complication seen in 30 – 72% of cardiac surgery which usually managed by the ventilatory recruitment and adequate chest physiotherapy [1, 2]. There are many cause for post operative atelectasis due to inhalational or intravenous anaesthetics [3] or increase in intrapulmonary shunt and decrease in pO2 on cardiopulmonary bypass [4]. etc. But here is the case where the atelectasis is due to intraluminal bronchial adenoma, type of benign pulmonary neoplasm where the patient was not diagnosed preoperatively. Bronchial adenoma develops in the peripheral lung with mucus production and was first reported as a rare tumor [5]. In 2021, the tumor was listed as bronchiolar adenoma including a nonclassical type with less papillary growth in the WHO Classification 5th edition [6]. The epidemiological characteristics of bronchial adenoma include no sex difference and development at age 60 to 80 years (mean: 70.1 years) [7, 8]. Bronchial adenoma is a very uncommon, benign entity, defined as a proliferation of seromucous glands in the bronchial lamina propria, without cellular atypia [9], usually arising in the proximal airways, with some reports of peripheral and endobronchial localization [10]. Clinical manifestations are the result of bronchial obstruction due to tumor growth and include haemoptysis, cough, dyspnea, wheezing, and sometimes pneumonia [11]. Though the patient presented with the non-specific symptoms like cough and dyspnea which were obscured under the symptoms of severe aortic stenosis pre-operatively. Postoperatively, he developed right upper lobe

atelectasis which raised a huge suspicion to undergo bronchoscopy, on which small clot like mass found on the anterior segments of the right upper lobe and underwent cryotherapy for its extraction [12] which was found to be bronchial adenoma on histological evaluation. On the post operative day - 5, he underwent CT chest which suggestive of organized consolidation in the right upper and lower lobe with atelectatic areas. Also areas of ground glassing seen in both the lungs which may represent pulmonary haemorrhage [13]. Though he didn't have any clinical symptoms, still we decided to repeat the bronchoscopy which showed normal left bronchus, abnormal and granulation tissue at the right upper lobe mucosa. Thus, it is important to diagnose and treat the patients with a pulmonary tumor with inclusion of bronchial adenoma in differential diagnosis before surgery to avoid post-operative complications.

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