

Hemorrhagic bronchial mucosa syndrome

Amit Panjwani

European Diploma Adult Respiratory Medicine,
Department of Pulmonary Medicine, Seven Hills
Hospital, Mumbai, Maharashtra, India

Correspondence to Amit Panjwani, MD, DM,
3203, Type 3 Staff Quarters, Seven Hills
Hospital, Marol-Maroshi Road,
Mumbai - 400 059, Maharashtra, India
Tel: 91-22-67676767 (Ext: 72091);
E-mail: drameetp@gmail.com

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Flexible fiberoptic bronchoscopy is a commonly performed procedure that helps in the management of pulmonary disorders. Complications during this procedure are uncommon. An elderly man was subjected to fiberoptic bronchoscopy for the evaluation of his respiratory disorder. He had no clinical, biochemical, or hematological signs of coagulopathies. During the procedure, he developed hemorrhagic bronchial mucosa syndrome after a bout of uncontrolled severe coughing. This is an extremely rare complication of this procedure. A description of this condition and its mechanism is discussed here.

Keywords:

bronchoscopy, excessive cough, mucosal bleeding, petechiae

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Introduction

Flexible fiberoptic bronchoscopy (FOB) is an important tool in the hands of a pulmonologist for the management of various types of lung diseases. Several studies have confirmed very low rates of major complications with the use of FOB for diagnostic purposes. These complications are more frequent with transbronchial lung biopsies (TBLB) than with the standard FOB. The two most important complications seen with TBLB are pneumothorax and hemorrhage. Hemorrhage of more than 50 ml was seen in around 1.3% of cases subjected to TBLB in one series [1]. A very unusual, less recognized complication, ‘the hemorrhagic bronchial mucosa syndrome’, is presented here. Only one series of five cases in post-lung-transplant patients has been reported in the literature [2]. This is the first case of this complication described in a nonlung transplant situation with no features of pre-existing coagulopathies.

Case report

A 66-year-old gentleman presented with low-grade fever of 4-month duration. He also had anorexia and lost 3 kg of weight over 4-month duration. He had no cough, dyspnea, wheezing, hemoptysis, and bleeding from any site. He was a diabetic patient with fairly controlled blood glucose levels on glimepiride and metformin. He was not receiving any antiplatelets or NSAIDs. On evaluation, he was afebrile, pulse was 90/min, respiratory rate was 24/min, and blood pressure was 140/90 mmHg with an SpO₂ of 99% on room air. General and systemic examination was unremarkable. Investigations showed a hemoglobin of 13.5 g%, total leukocyte count of 11 000/mm³, differential counts were N63%, L22%, M7%, E8%B0%, platelet count was 2, 28 000/mm³, and erythrocyte sedimentation

rate was 45 mm after 1 h. Bleeding time was 2 min 10 s, prothrombin time was 10.6 s (control 10.3 s), international normalized ratio was 1, activated partial thromboplastin time (APTT) was 23.2 s (control 24.4 s), and creatinine was 0.72 mg%. Liver function test was normal. HbA1c of 7.4% was observed. HIV serology was negative. Ultrasonography of the abdomen and pelvis was unremarkable. Chest radiograph showed reticular opacities in both lungs. High resolution computed tomography (HRCT) of the thorax showed focal consolidation in the right lower lobe. Interlobular thickening was seen in the subpleural areas on both sides. Randomly distributed micronodular opacities were seen in both lungs. A few of these nodules were calcified. Right-sided mild pleural thickening was seen along with small subcentimeter mediastinal lymph nodes. Hypertonic-saline-induced sputum for ziehl-neelsen (ZN) smear examination was negative for acid fast bacilli on three occasions. Induced sputum for bacterial culture was insignificant. Pulmonary function test (PFT) showed a mild restrictive defect with no significant bronchodilator reversibility and normal diffusion study. Two-dimensional echocardiography was normal. Patient was treated with co-amoxiclav and azithromycin for 10 days and 5 days, respectively. As there was no significant improvement, he was subjected to FOB with an intention to collect bronchoalveolar lavage for microbiological and cytological studies and obtain a TBLB. Sedation was obtained with midazolam 1 mg. He was subjected to nebulized lignocaine as a measure to anesthetize the airway and prevent coughing during the procedure.

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After the bronchoscope was introduced, tracheal and bronchial mucosa appeared normal with no hyperemia or significant secretions (Fig. 1). Within sometime, the patient had a fit of coughing and developed diffuse petechiae in the mucosa of the trachea and both main bronchi. The petechiae coalesced into mucosal hemorrhages (Figs. 2 and 3). The procedure was stopped and the patient was managed with antitussives during the postbronchoscopy period. There was no significant hemoptysis later and it completely subsided by the next day. The sputum culture subsequently showed rapidly growing atypical mycobacteria on three consecutive samples. The exact species could not be identified. However, the sensitivity profile of the isolated organism revealed sensitivity to quinolones, tetracyclines, tigecycline, and imipenem. He was treated with moxifloxacin and doxycycline with which he showed a satisfactory clinical and radiological improvement.

Discussion

FOB is a commonly performed diagnostic and therapeutic procedure for evaluation of patients with pulmonary disorders. It can safely be performed as an outpatient procedure. Most of the series report a serious complication rate of 1.1% and a mortality of 0.02%. The common complications reported include bleeding, tachycardia/bradycardia, cough, dyspnea, bronchospasm/laryngospasm, pneumothorax, and pulmonary edema. Minor bleeding occurs in 0.19% and severe bleeding in 0.26% of bronchoscopies. The majority of patients who develop bleeding have normal coagulation parameters with no significant risk factors for bleeding [3]. The patient developed hemorrhage during the bronchoscopy after the patient had a bout of excessive violent coughing. The appearance of these hemorrhages has recently been described as 'the hemorrhagic bronchial mucosa syndrome' [2]. He did not have any clinical, biochemical, or hematological signs of coagulopathies. He was not on any drugs known to cause bleeding. Efforts were made in the present case to prevent cough by providing an adequate sedation and using lignocaine during the procedure. FOB was performed with utmost care positioning the tip of the bronchoscope in the airway lumen and avoiding collision of the scope with the airway mucosa. Cough can be described as modified Valsalva maneuver, especially during the compressive and expiratory phases. During vigorous coughing, intrathoracic pressures upto 300 mmHg, expiratory velocities of up to 28 000 cm/s, and systolic pressure up to 140 mmHg may be generated [4]. Thus, the high vascular pressures generated during coughing also increases the mucosal capillary pressure. This could result in rupture of the

Figure 1



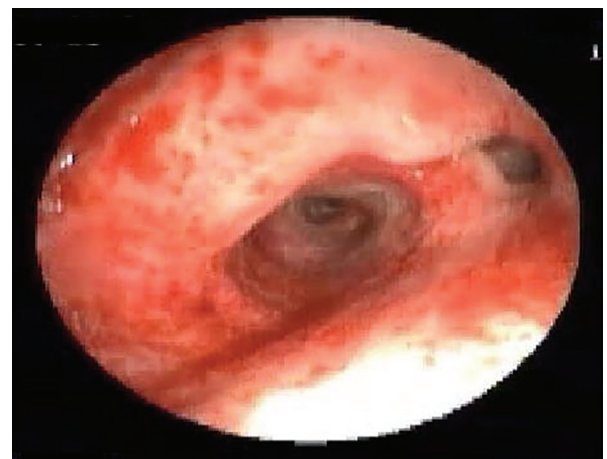
Normal trachea and bronchial mucosa at the level of carina.

Figure 2



Petechiae coalescing into mucosal hemorrhage in the trachea and both bronchi.

Figure 3



Mucosal intrabronchial bleeding.

capillaries in a well-vascularized bronchial mucosa. Severe cough as a cause of tracheobronchial mucosal

bleeding has been described recently [5]. Elderly people have a thinning of dermal tissues resulting in an increased fragility of blood vessels. This leads to tears in superficial vessels even with negligible trauma and development of ecchymosis and purpura. These lesions have also been observed in the oral mucosa of elderly patients. They are caused by reduced perivascular support, capillary fragility and permeability, or due to a combination of these factors [6]. The advanced age of the patient may have influenced the bronchial mucosa, resulting in a fragile bronchial capillary bed that may have predisposed to the bronchial mucosal hemorrhage. All possible measures should be taken during bronchoscopy to avoid coughing and prevent associated hemorrhage. Benzodiazepine in combination with an opiate, such as hydrocodone, may be used to achieve a better patient satisfaction and antitussive effect during the FOB.

Conclusion

The hemorrhagic bronchial mucosa syndrome is an extremely rare complication of FOB. Severe coughing and capillary fragility are the important predisposing features. Therefore, it would be prudent to take measures during bronchoscopy to prevent coughing, such as ensuring adequate sedation, using inhaled

bronchodilators in patients with reactive airways, administering appropriate doses of local anesthesia, and avoiding collision of the bronchoscope with the airway mucosa during the procedure. If these measures are insufficient to control cough, then adding an opiate such as hydrocodone may benefit the patient from its antitussive effect.

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Conflicts of interest

There are no conflicts of interest.

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