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Massive haemoptysis from right middle lobe bronchus managed by customized silicon stents

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Abstract

Massive haemoptysis is life-threatening. Management options include pharmacological treatment, bronchial artery embolization, surgical resection, and bronchoscopic interventions. As an alternative treatment method of controlling haemoptysis, endobronchial stent insertion has been performed in several pulmonary carcinoma patients. We presented an 89-year-old bronchiectasis patient who developed massive haemoptysis from the right middle lobe bronchus. Haemoptysis was not controlled by both pharmacological treatment and bronchial artery embolization. Two customized silicone stents with the one in the right middle lobe bronchus and another in the right intermediate bronchus were used to manage haemoptysis. One month after stents implantation, the stent inside the right intermediate bronchus was removed, another stent was left in the right middle lobe bronchus to continue occluding the bleeding passageway. Haemoptysis did not occur after silicon stents deployment. This may be the first case of receiving straight silicon stent implantation to manage massive haemoptysis from the right middle lobe bronchus.

Introduction

Haemoptysis is a common manifestation of pulmonary diseases. Because massive haemoptysis can be fatal, early detection and proper management are critical. Management options for haemoptysis include pharmacological treatment, bronchial artery embolization, and surgical resection.

Apart from methods above, bronchoscopic interventions including endobronchial stent insertions are also used in the treatment of haemoptysis [1]. However, there has been no case report of using straight silicon stent as endobronchial tamponade to treat massive haemoptysis from the right middle lobe bronchus.

Here we report a patient with bronchiectasis who developed massive haemoptysis. Two straight silicone stents were used to control haemoptysis.

Case Report

An 89-year-old male patient with complaints of cough and haemoptysis was admitted. The patient had 30 years history of right middle lobe bronchus bronchiectasis. One month previously, the patient suffered a massive haemoptysis. Bronchial artery embolization successfully controlled airway bleeding.

Nevertheless, haemoptysis recurred. The bleeding volume reached nearly 100 mL before visiting our hospital. Thoracic computed tomography (CT) scan revealed volume reduction and inflammatory effusion in the right middle lobe. The patient received emergent right bronchial artery embolization again. However, haemoptysis was still developing. About 30–50 mL blood was coughed out per hour. The patient was urgently taken to the intensive care unit. Bronchoscopy was performed.

Active bleeding from the right middle lobe bronchus was temporarily controlled by spraying haemostatic medications and cryotherapy.

The next day, the patient received rigid bronchoscopy in the operation room; 0.2% epinephrine and thrombin were sprayed and cryotherapy was performed for temporary cessation of bleeding. The proximal end of an 8 mm × 3 cm silicon stent (Tracheobronxane, Novatech, La Ciotat, France) was sutured to be closed. We attempted to send this stent into the right middle lobe bronchus for several times but failed. Then this stent was cut to 1.5 cm and was successfully deployed using biopsy forceps (Boston Scientific Corporation, Natick, MA, USA). The distal end of another 12 mm × 5 cm silicon stent was pruned to about 6 mm width. Two sides of the distal about 20 mm length were sutured. Then the customized stent was placed from the right intermediate bronchus, across the right middle lobe bronchus, to the right lower lobe bronchus to avoid the migration of the first stent.

After placement of the stents, bleeding stopped promptly. The patient was transferred to the respiration department. He received successive antibiotic therapy. No obvious complication of obstructive pneumonia developed.

One month after the operation of stents implantation, complete atelectasis of the right middle lobe and the right lower lobe with the complication of right pleural effusion occurred (Fig. 1). The patient received further surgery to remove the silicon stent inside the right intermediate bronchus. The stent inside the right middle lobe bronchus was left. Thoracic puncture and drainage were done after stent extraction for relieving pleural effusion. Post-operation CT scan reviewed the patient's chest and revealed the right lower lobe recruitment (Fig. 2).

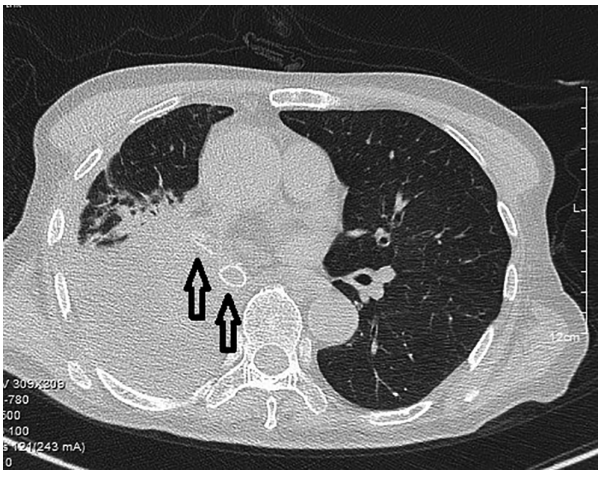

Figure 1. Computed tomography scan of the present patient one month after stents implantation in the right middle lobe bronchus and right intermediate bronchus. The arrows on the figure refer to the sites of silicon stents.

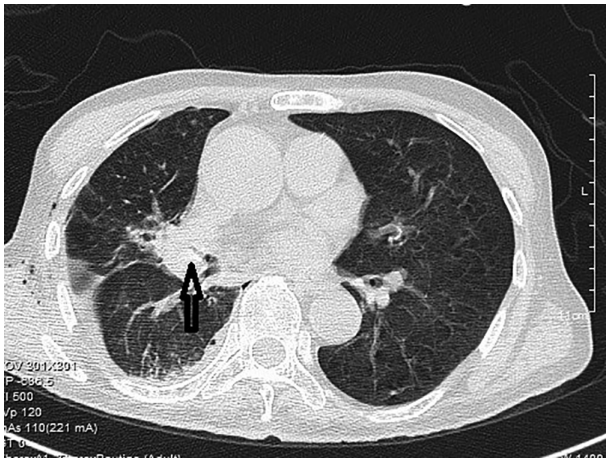

Figure 2. Computed tomography scan of the present patient 10 days after stent displacement from the right intermediate bronchus. The arrow on the figure refers to the site of silicon stents.

Ten days after stent extraction, the patient left hospital. During the three months follow-up time, haemoptysis did not occur any more.

Discussion

Haemoptysis is defined as the expectoration of blood from the trachea or bronchial tree. Massive haemoptysis puts patients at high risk of asphyxiation, so protecting the airway from occlusion is the top priority in management.

Apart from pharmacological treatment, bronchial artery embolization, and surgical resection, bronchoscopic interventions are also used in the management of haemoptysis. These interventions are spraying haemostatic medications, endobronchial ablation, temporary placement of airway blocker, implantation of specific medical devices, including oxidized regenerated cellulose mesh [2], airway spigots [3], endobronchial valves [4], and airway stents [5].

The present procedure used two customized silicon stents to manage massive haemoptysis. The first one was deployed in the right middle lobe bronchus to occlude the passageway of bleeding, and the second stent was implanted from the right intermediate bronchus to the right lower lobe bronchus to prevent the first one from displacement, and strengthened the effect of occluding the passageway of bleeding.

Different from the published reports, straight silicon stents but not covered self-expanding stents were used in the present case. Silicon stents can be sized to the required length at the time of procedure. We customized the first silicon stent and finally deployed it even in the right middle lobe bronchus. This had not been reported

in published papers. Furthermore, the terminals of silicon stents can be sutured to be closed ends. This procedure changes silicon stent to be an airway blocker, but not a routine stent depending on the stent wall occluding the passageway of bleeding sites or directly compressing bleeding sites. For the present patient, owing to the customizing of the first stent to be a blocker, the second stent could be taken out one month after stents implantation. This procedure decreased the iatrogenic damage to the utmost extent.

According to the existing publication, the cases who received airway stents implantation for haemostasis were all lung cancer patients. Differently, aetiology of haemoptysis of the present case was bronchiectasis. This benign aetiology further prompted us to choose silicon stents but not self-expanding metal stents.

To the best of our knowledge, the present patient is the first case receiving straight silicon stent implantation to manage haemoptysis from the right middle lobe bronchus. This is also the first report of using airway stent implantation to treat haemoptysis generating from benign disease but not pulmonary carcinoma.

Disclosure Statement

Appropriate written informed consent was obtained for publication of this case report and accompanying images.

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