Case Report

Left Sleeve Basal Segmentectomy for Broncholithiasis

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Broncholithiasis is an uncommon pulmonary problem that may present with life-threatening complications. We report one case of broncholithiasis. A 49-year-old female presented with hemoptysis. Chest X-ray and computed tomography (CT) showed left interlobar lymph node calcification near the interlobar pulmonary artery, and calcification continued into the basal bronchus. Bronchoscopy demonstrated pedunculated granulation tissue in the left B8 bronchus obstructing the lumen. We did not recommend endobronchial removal because of the risk of bleeding, so we proposed surgical treatment. We performed left basal segmentectomy associated with bronchoplasty to preserve pulmonary function. It is important to gain proximal control of the pulmonary artery before dissection of its branches and to approach the pulmonary artery from the periphery to avoid massive intraoperative bleeding. The intrabroncholuminal stone was composed of 61% calcium carbonate and 39% calcium phosphate. The postoperative course was not eventful, and the bronchoscopical findings confirmed a good surgical outcome. (Ann Thorac Cardiovasc Surg 2008; 14: 101–104)

Key words: hemoptysis, broncholithiasis, sleeve segmentectomy

Introduction

Broncholithiasis is an uncommon pulmonary problem caused by a healing process of granulomatous pulmonary infection and may present with life-threatening complications. We report one case of broncholithiasis recently encountered at our hospital.

Case Report

A 49-year-old female presented with a history of hemoptysis. Her medical history was significant only for a history of asthma, which had been diagnosed at 36 years of age. The initial physical examination was unremarkable, and further evaluation included a plain chest radiograph, a computed tomography (CT) scan, and bronchoscopy. A plain chest radiograph demonstrated right tracheobronchial and left hilar lymphadenopathy with calcification. The mediastinal window of the chest CT scan (Fig. 1) demonstrated left interlobar lymph node calcification, near the interlobar pulmonary artery, and calcification continued into the left basal bronchus. No contrast agent was used during this study because of patient allergy; thus we could not determine the proximity to or involvement of the pulmonary artery. Flexible fiberoptic bronchoscopy (Fig. 2) demonstrated pedunculated granulation tissue in the left B8 bronchus obstructing the lumen, and a calcified nodule was observed peripheral to the granulation tissue. There was no reddish tissue around the granulation. Pulmonary function testing showed normal with VC of 2,520 mL and FEV1.0 of 2,090 mL. She was diagnosed as having broncholithiasis and was scheduled for surgery.

Left lateral thoracotomy was performed via the 4th intercostal space. First, we taped the left pulmonary ar-

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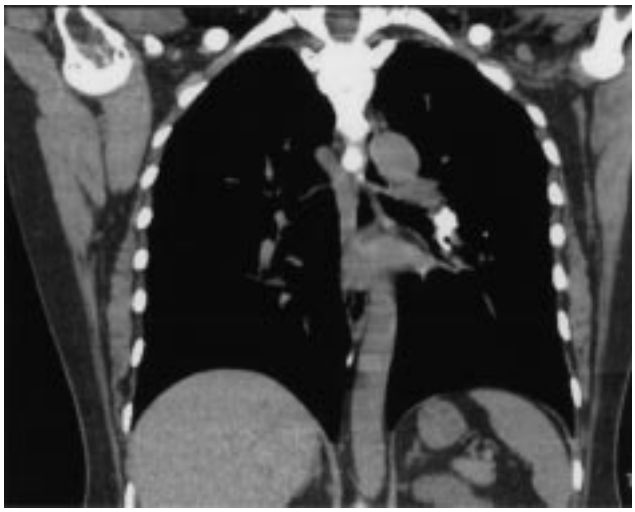

Fig. 1. The chest computed tomography (CT) scan demonstrated left interlobar lymph node calcification, near the interlobar pulmonary artery, and its calcification continued into the left basal bronchus.

Fig. 2. Bronchoscopy demonstrated pedunculated granulation tissue in the left B8 bronchus obstructing the lumen.

tery at the left hilum to prevent massive bleeding. The interlobar calcified lymph node was adherent to the interlobar pulmonary artery and bronchus. After a dissection of the adherent fissure by blunt and sharp dissection, A8 and A9+10 were ligated and divided peripheral to the calcified lymph node adhering to the interlobar pulmonary artery. Care was taken to avoid injury to the pulmonary artery. Next, the left basal bronchus was exposed peripheral to the bronchial segment involved by the calcified lymph node. After exfoliation in the calcifed lymph node from the interlobar pulmonary artery, the bronchus was resected due to adherence and involvement in the calcified lymph node. We performed left basal segmentectomy and bronchoplasty. The left second carina was resected and the lingular bronchus wall and S6 bronchus wall were sutured to achieve bronchoplasty. We used interrupted 4-0 and 5-0 polydioxanone suture (PDS) between the lower bronchial wall of B4+5 and the basal bronchial side wall of B6 to perform bronchoplasty while carefully maintaining bronchial lumen patency. Part of the bronchoplasty was covered with the left lobe of the thymus. Surgical duration was 250 min, and intraoperative blood loss was 220 mL.

Flexible fiberoptic bronchoscopy (Fig. 3) showed good patency of the upper lobe bronchus and B6, which comprised the reconstructed bronchus. Macroscopically, an intrabroncholuminal stone was loosely adherent to the bronchial interface. An interlobar calcified lymph node involved the bronchial wall and formed a fistula. The intrabroncholuminal stone was composed of 61% calcium carbonate and 39% calcium phosphate. The postoperative course was not eventful, and the patient was discharged on the 12th postoperative day.

Discussion

Broncholithiasis is defined as the presence of calcified or ossified material within the lumen of the tracheobronchial tree. Broncholithiasis is a rare disorder, and its incidence is 0.1%–0.2% in respiratory disease patients and 0.8% in hemoptysis or hemosputum patients. This disease is classified into four groups according of its etiology: extraluminal, intraluminal, interluminal, and systemic, with extraluminal cases being the most common. Most broncholiths are peribronchial lymph nodes that have undergone dystrophic calcification subsequent to an inflammatory process.[1] The most common etiology of broncholithiasis is histoplasmosis in North America and tuberculosis worldwide.[2]

Broncholithiasis occurs in the right bronchus predominantly, and a case involving the left lower bronchus, like the present case, is rare.[2] Broncholithiasis is asymptomatic, and the diagnosis is made incidentally on a routine chest X-ray. The signs and symptoms include cough, sputum, fever, hemosputum, hemoptysis, and wheeze, and dyspnea and lithoptysis incidentally. Life-threatening

Fig. 3. Bronchoscopy showed good patency of the upper lobe bronchus and B6.

complications, such as massive hemoptysis or bronchoesophageal fistula, may develop. A diagnosis of broncholithiasis is established by flexible bronchoscopy and CT, but some cases are diagnosed as broncholithiasis postoperatively.

Asymptomatic cases require no treatment, but symptomatic cases require bronchoscopic removal or surgery. The goals of treatment should be a removal of all calcification and irreversibly damaged bronchi or lung, along with the conservation of as much normal pulmonary parenchyma as possible.[3] Bronchoscopic removal is a minimally invasive treatment,[4,5] but carries a risk of bleeding. Stone extraction should be limited to stones that extend into the bronchial lumen. Several authors[6–8] have argued that endoscopic stone removal, preferably by rigid bronchoscopy, can be attempted if no complications of stone erosion like massive hemoptysis, fistulas, or lung abscesses are present, especially if the broncholith is loose and mobile within the bronchial lumen. Since in our case we could not confirm a movement of the broncholithiasis and the intraluminal stone was continuous with the interlobar lymph node, surgical treatment was recommended.

Because tracheobronchial stenosis is frequently associated with postobstructive pneumonitis, lung abscess, or bronchiectasis, pulmonary resection rather than isolated broncholithectomy is often indicated. In surgical treatment, safety and the preservation of the pulmonary function are important in cases of central lesion, but cases of peripheral lesion present fewer problems. However, lymph node calcification in this disease is frequently associated with an intense inflammatory response, which makes surgical dissection difficult and significantly increases the likelihood of intraoperative complications, specifically, hemorrhage. Segmentectomy is a more difficult procedure than lobectomy, and such procedures are more difficult in the presence of inflammatory disease.

In our case, intrabroncholuminal calcified nodule was continuous with interlobar calcified lymph node near the interlobar pulmonary artery. The left lower lobectomy plus lingulectomy or left pneumonectomy may be necessary for the complete resection of calcified lymph node and broncholithiasis. In this case, we scheduled left basal segmentectomy to preserve pulmonary function. First, we taped the left pulmonary artery at the left hilum to avoid massive intraoperative bleeding. Next, we ligated and cut the pulmonary artery peripheral to the calcified lymph, then dissected the calcified lymph node from the pulmonary artery. We avoided the left lower lobectomy plus lingulectomy or left pneumonectomy and could perform left basal segmentectomy followed by bronchoplasty, obtaining good results.

In summary, we encountered a case of broncholithiasis, which caused a perforation of the bronchial wall resulting from calcified lymph node. We did not recommended endobronchial removal because of the risk of bleeding and proposed surgical treatment. We performed a left basal segmentectomy followed by bronchoplasty for the preservation of pulmonary function. It is important to gain proximal control of the pulmonary artery before a dissection of its branches because the vascular planes are frequently obliterated by longstanding fibrosis. Next, the pulmonary artery, which barely contacted the calcified lymph node, is approached from the periphery.

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