

# Mucoid Impaction after Segmental Resection of Lung

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**Lung segmentectomy is generally considered as a standard procedure in general thoracic surgery. Anatomical variations of pulmonary segmentation may, however, make it difficult to determine the precise area of resection during segmentectomy. Incomplete pulmonary sublobar resection may produce unusual radiographic features. Herein, we report a case of bronchial atresia after lung segmentectomy. (Ann Thorac Cardiovasc Surg 2008; 14: 249–251)**

**Key words:** lung, surgery, mucoid impaction

## Introduction

Today, general thoracic surgeons select lung segmentectomy as the surgical treatment procedure for various conditions, including lung cancers, metastatic lung tumors, congenital pulmonary diseases, pulmonary infectious diseases, and other tumorous lesions.<sup>1,3)</sup>

Lung segmentectomy is defined as resection of a pulmonary segment with ligation of the segmental artery and vein and suture closure of the segmental airway. The area of the lung to be resected is determined by various techniques, e.g., occlusion of the segmental bronchus after or before inflation and identification of the pulmonary vessels defining the borders between segments.<sup>1,3)</sup> However, it remains difficult to define the accurate segmental area during the operation. The residual pulmonary tissue after sublobar resection may produce unusual radiographic features, as described below.

## Case Report

A 70-year-old woman was found to have an abnormal

opacity on the chest X-ray and computed tomography (CT) a year earlier. The patient had been diagnosed to have lung cancer when she was 62 years old and had undergone segmental resection (right S6) by video-assisted thoracic surgery (VATS). The lung cancer had been classified as stage IA (T1N0M0) pathologically and the histological subtype was well-differentiated papillary adenocarcinoma. She had had no recurrence of the lung cancer prior to the detection of this abnormal chest opacity. A transbronchial biopsy was performed. The cytology result was reported as class III. <sup>18</sup>F-fluoro-2-deoxy-D-glucose positron emission tomography (FDG PET) revealed no positive findings. However, the serum sialyl Lewis x-i antigen (SLX) level was slightly elevated (130 U/mL; normal range in our hospital under 38.0 U/mL). She was referred to our hospital for a resection of the lesion.

A chest roentgenogram showed an irregularly shaped opacity in the right lung (Fig. 1). The patient had no symptoms at admission. CT revealed an irregularly shaped lesion near the pulmonary hilum and the staples from the previous lung surgery (Fig. 2). Bronchoscopy clearly revealed closure of the stump of B6, and there was no evidence of intraluminal recurrence.

A right thoracotomy was performed. A mass lesion, elastic-soft in consistency, was found caudal to the granulation tissue around the staples. We found that the segmental pulmonary artery and bronchus to S6 were appropriately ligated. The tumor contained a brown-green jellylike fluid. Cytology of the fluid revealed no evidence of malignancy, and bacterial culture was negative. We resected this tumor and the residual S6 lung

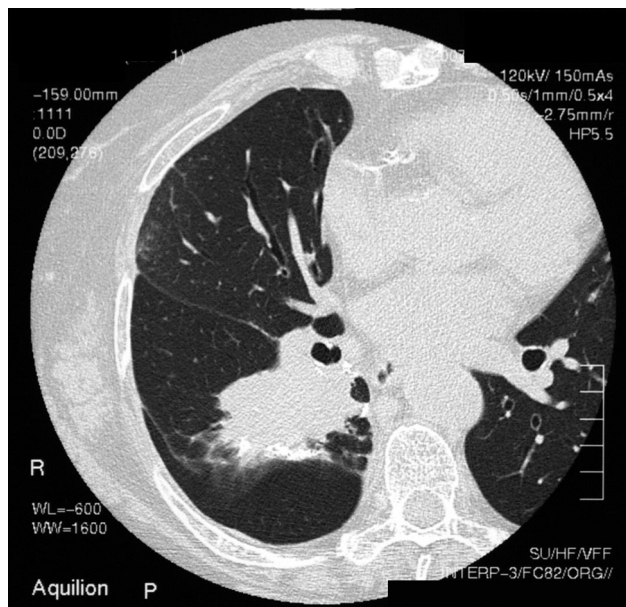
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**Fig. 1.** Chest X-ray shows an irregular tumor shadow at the right hilum.



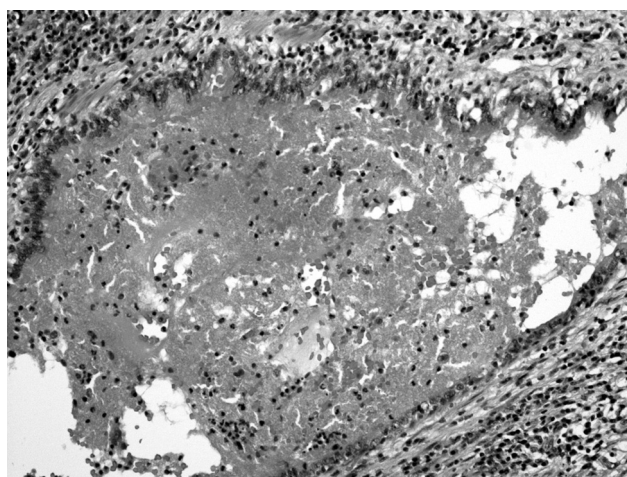
**Fig. 2.** Computed tomography (CT) scan image shows a mass region at the right lower lobe with staples.

tissue. Histological examination of the resected tissue revealed dilated airways, chronic inflammatory cells, mucoid impactions, and proliferation of alveolar type II epithelial cells (Fig. 3). By 3 weeks after the operation, the serum SLX level had decreased to the normal range (33.7 U/mL).

## Discussion

Lung segmentectomy was first conducted by Churchill and Belsey in 1939.<sup>2)</sup> This surgical procedure is regarded as being more difficult than a lung lobectomy.<sup>1)</sup> Thoracic surgeons currently perform lung segmentectomy not only in cases of early lung cancer and benign lung diseases, but also in cases of advanced lung cancer with limited pulmonary function. The key procedures are division of the segmental pulmonary vessels, division of the segmental bronchus, and determination of the intersegmental plane.<sup>1)</sup> After segmental resection, the residual segmental pulmonary parenchyma remains disconnected with the central airways, but not completely independent from the abutting segments.

In our case, there was a mount of residual segmental tissue distal to the divided bronchus. Thus the blood supply to the residual tissue from the abutting segments and its lack of connection with the central airways resulted in mucoid impaction in the residual pulmonary



**Fig. 3.** Histological examination of hematoxylin and eosin stain shows dilated airways, chronic inflammatory cells, mucoid impactions, and proliferation of alveolar type II epithelial cells.

tissue. We consider that the patient had developed dilated airways with mucoid impaction distal to the divided bronchus as a result of the postoperative bronchial atresia. Ishii et al.<sup>4)</sup> and Kanehara et al.<sup>5)</sup> reported an occasional increase of the serum levels of serum SLX in cystic lesions, and that the levels decreased after a resection of these lesions. The serum levels of SLX

also fluctuated in our case, as they did in these cases.

Division of the segmental bronchus and along an incomplete intersegmental plane may cause postoperative bronchial atresia. Thoracic surgeons must bear in mind that a false decision on intersegmental planes during segmentectomy may result in postoperative bronchial atresia in the residual lung tissue.

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