

CASE REPORT

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Additional lobectomy for atypical carcinoid diagnosed after S3 segmentectomy

Tsuyoshi Uchida, Hirochika Matsubara, Mamoru Muto, Yuichiro Onuki, Hiroyasu Matsuoka, Hiroyuki Nakajima

ABSTRACT

Introduction: Pulmonary segmentectomy is performed for early-stage lung cancer as a limited resection to preserve pulmonary function. However, the criteria for segmentectomy remain controversial. We report a case in which S3 segmentectomy was performed for a very small nodule, and completion lobectomy was required due to the risk of malignant remnants. **Case Report:** A 70-year-old woman with asthma was referred to our hospital for a ground-glass lung nodule with a solid component. Computed tomography indicated a 0.4-cm solid nodule in the upper lobe segment 3 (S3). S3 segmentectomy was performed because the position of the nodule rendered wedge resection difficult. After the surgery, the pathological analysis revealed that the tumor was an atypical carcinoid, and metastasis was found in the no. 13u lymph node. Thus, completion lobectomy and mediastinal lymph node dissection were performed. Her postoperative course was good, and she had no tumor recurrence 20 months after the surgery. **Conclusion:** This case demonstrates two key points. First, care should be taken when segmentectomy is indicated, even if the tumor is small. Second, lymph node metastasis may be detected in segmentectomy, which might be missed in lobectomy.

Keywords: Additional lobectomy, Atypical carcinoid, Completion lobectomy, Ground-glass nodule, S3 segmentectomy

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INTRODUCTION

Pulmonary segmentectomy is performed for early-stage lung cancer as a limited resection to preserve pulmonary function; however, it has also been performed for benign tumors or inflammatory diseases. The number of early-stage lung cancers detected has increased as computed tomography (CT) becomes more common. Thus, the number of limited resections performed for primary lung cancer is expected to increase. However, the criteria for segmentectomy remain controversial. This report presents a case in which S3 segmentectomy was performed for a very small nodule, and completion lobectomy was needed because of the risk of malignant remnants.

Written informed consent for publication of the clinical details and clinical images was obtained from the patient and her husband.

CASE REPORT

A 70-year-old woman with asthma had been followed up for seven years because of multiple bilateral ground-glass nodules (GGNs) in the lungs. She was referred to our hospital because one of the GGNs developed a solid portion. Laboratory investigations showed that she has no hepatic or renal abnormalities, and the nutritional status was unremarkable. Computed tomography

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revealed a solid nodule (diameter, 0.4 cm) (Figure 1), with a standardized uptake value (SUV) of 1.00. Based on these findings, lung cancer was suspected. However, bronchoscopic biopsy was not planned because the nodule was very small, and it was difficult to perform bronchoscopy; thus, a surgical biopsy was planned.

After assessing the patient's health, S3 segmentectomy was performed because the position of the nodule rendered wedge resection difficult. Due to the presence of other pale GGNs, resection was limited, as another pulmonary resection might be required.

Intraoperative frozen section analysis of the tumor indicated a carcinoid, while a frozen section of the no. 11s lymph node indicated no metastasis; thus, additional resection was not performed (Figure 2).

After surgery, pathological findings revealed that the tumor was an atypical carcinoid, and there was metastasis in the no. 13u lymph node. We presented this information to the patient and her family and obtained informed consent. Then, completion lobectomy and mediastinal lymph node dissection were performed. There were no malignant findings in the residual upper lobe and lymph nodes. The patient had no tumor recurrence 20 months after the surgery.

DISCUSSION

This case demonstrates the following two key points. Care should be taken when segmentectomy is indicated, even if the tumor is small. The ratio of the maximum

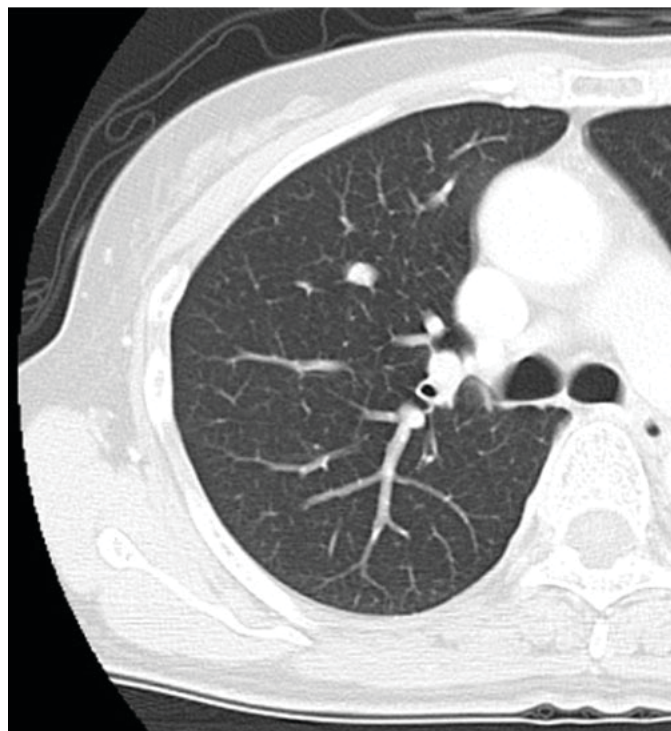


Figure 1: Computed tomography (CT) indicates a 0.4-cm solid nodule. There are no other nodules or lymph node metastases.

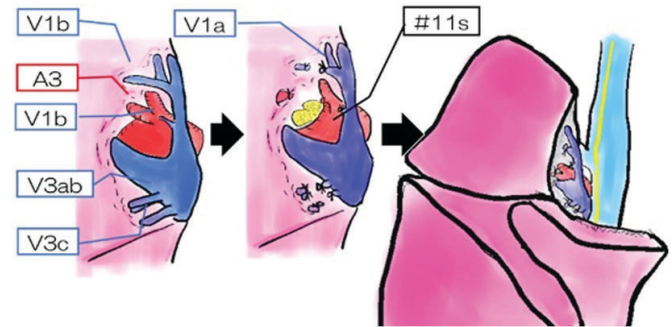


Figure 2: The pulmonary veins (V1b and V3) and the pulmonary artery (A3) were ligated and cut. The same was done for the B3 bronchus. The incompletely lobulated minor fissure was autosutured, and the intrasegmental border was divided by an electric scalpel. Intraoperative frozen section diagnosis was performed for the nodule and the no. 11s lymph node; the nodule was determined to be carcinoid, and no metastasis was found in the no. 11s lymph node. Thus, completion lobectomy was not performed.

diameter of consolidation to the maximum tumor diameter (consolidation/tumor ratio, CTR) is important when defining an early adenocarcinoma of the lung radiologically [1, 2]. Asamura et al. reported that a CTR of 0.25 or less in tumors ≤ 2.0 cm and 0.50 in tumors ≤ 3.0 cm was a radiologic criterion for excellent prognosis [2].

In this case, limited resection was performed because the nodule diameter was 0.4 cm. However, the nodule was a solid type, which carries a high risk of malignancy. The pathological analysis revealed an atypical carcinoid with metastasis in the no. 13u lymph node. Thus, there was no other choice but to perform the completion lobectomy.

It is important to perform completion lobectomy as soon as possible because of the potential for severe adhesions [3]. Lymph node metastasis undetected by lobectomy may be discovered by performing segmentectomy. The performance of segmentectomies has increased, and segmentectomy has recently been established as a viable treatment for peripheral early non-small cell lung cancer. Previous reports have indicated that segmentectomy is superior to lobectomy with regard to residual lung function [4, 5]. Thus, the performance of pulmonary segmentectomies will probably increase further.

There must be no residual malignant cells after limited resection. Therefore, intraoperative frozen section diagnosis was performed for the nodule and the no. 11s lymph node. The nodule was observed to be carcinoid and no metastasis in the no. 11s lymph node was found. The carcinoid could not be identified as typical or atypical at that moment. Because the nodule was possibly a typical carcinoid, completion lobectomy was not performed.

However, the final pathological findings showed carcinoid cells in the no. 13u lymph node. If the lobectomy had been performed, the no. 13u lymph node may not have been dissected, because there was no suspected

metastasis in the lymph node. Thus, this lymph node metastasis was found by segmentectomy rather than lobectomy.

CONCLUSION

When segmentectomy is indicated, both tumor size and CTR should be considered. Moreover, lymph node metastasis may be detected in segmentectomy, whereas the same nodes might be missed in lobectomy.

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Tsuyoshi Uchida – Design of the work, Acquisition of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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