Primary Adenocarcinoma of the Bronchus; Palliative Resection with Rigid Bronchoscopy, Followed Curative Pulmonary Sleeve Resection; Report of a Case

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A rare case of a patient with primary adenocarcinoma of the middle lobe bronchus that was successfully treated with rigid bronchoscopy followed by middle sleeve lobectomy is reported. The patient was a 75-year-old man who presented with low-grade fever and cough. Chest computed tomography showed obstructive pneumonia of the lower lobe and a polypoid lesion in the truncus intermedius. Middle sleeve lobectomy and mediastinal lymphadenectomy were performed following recovery of respiratory function after partial resection of the tumor with rigid bronchoscopy. There was no sign of tumor recurrence and metastasis over 32 months of follow-up. We should be aware of tracheal or bronchial tumor in patients with prolonged asthma-like symptoms. Palliative resection with rigid bronchoscopy was useful to make the correct diagnosis, evaluate the extent of the tumor, and protect the right lower lobe.

Keywords: rigid bronchoscopy, pulmonary resection, adenocarcinoma

Introduction

Primary tumors of the trachea can be benign or malignant and account for fewer than 0.1% of tumors.1) Histologically, most tumors are squamous cell carcinoma and adenoid cystic carcinoma.2) Adenocarcinoma is a very uncommon neoplasm. Therefore, the clinical characteristics and surgical results of adenocarcinoma have not been thoroughly discussed. Moreover, tracheal and bronchial tumors are sometimes misdiagnosed as bronchial asthma. A rare case of a patient with primary adenocarcinoma of the middle lobe bronchus that was successfully treated with rigid bronchoscopy followed by middle sleeve lobectomy is reported.

Case Report

A 75-year-old man with a low-grade fever and cough visited a regional hospital. He was diagnosed as having bronchial asthma 7 months before this episode. He was found to have an infiltrate shadow in the right lower lobe and a polypoid lesion in the truncus intermedius on chest computed tomography (Fig. 1). Bronchoscopy was done, and tumor that obstructed the bronchus of the middle and lower lobes was found. Transbronchial biopsy was performed, and papilloma or adenocarcinoma was suspected. The patient was referred to our hospital for further examination and evaluation of surgical treatment.
The patient’s pulmonary function tests showed: vital capacity (VC), 2800 ml; percent of vital capacity (%VC), 85.1%; forced expiratory volume/1 second (FEV1.0), 1830 ml; and forced expiratory volume 1% (FEV1.0%), 70.4%. Arterial blood gas analysis showed that the arterial oxygen (PaO₂) and carbon dioxide (PaCO₂) pressures on room air were 74.7 mmHg and 42.4 mmHg, respectively. Though his respiratory function was found to be within the normal range, it was thought that the respiratory function would improve following tumor resection. Moreover, it was important to get further information about the distal truncus intermedius. Therefore, two-stage surgery was planned, with the first stage involving tumor resection with rigid bronchoscopy to obtain information about the peripheral bronchial status, followed by curative resection after recovery from obstructive pneumonia and improvement in lung function.

Under general anesthesia, the patient underwent rigid bronchoscopy with electrocautery and partial bronchoscopic resection of the tumor that was obstructing the distal part of the truncus intermedius (Fig. 2). Two weeks after rigid bronchoscopy, his second pulmonary function tests showed improvement: VC, 4440 ml; %VC, 135.8%; FEV1.0, 3290 ml; and FEV1.0%, 76.2%. Arterial blood gas analysis also showed recovery of PaO₂ and PaCO₂ on room air (100.3 mmHg and 44.5 mmHg, respectively). Because the residual tumor was in the ostia of the middle lobe, right middle sleeve lobotomy with postero-lateral thoracotomy and mediastinal lymph node dissection were performed. It was confirmed intra-operatively that the bronchial stump was cancer-free after checking the bronchial stump three times, because the tumor extended unexpectedly to the proximal side. The operation time was 365 minutes, and the total amount of bleeding was 52 ml. On pathological examination, the tumor was a remnant papillary adenocarcinoma (Fig. 3). There were no lymph node metastases. Thus, the patient was diagnosed with T1aN0M0 stage IA disease. His postoperative course was uneventful, and he was discharged. No adjuvant therapy was given. There was no sign of tumor recurrence or metastasis over 32 months of follow-up.

**Discussion**

A rare case of a patient with primary adenocarcinoma of the middle lobe bronchus that was partially resected with rigid bronchoscopy to make a correct diagnosis and evaluate the extent of the tumor before middle sleeve lobectomy was performed is reported.

Primary tumors of the trachea can be benign or malignant and account for fewer than 0.1% of tumors.1) Adenocarcinoma is particularly rare. Webb, et al2) reported 74 patients with primary tracheal cancers over a 60-year period. According to their report, 45.9% was squamous
cell carcinoma, 25.7% was adenoid cystic carcinoma, and 28.4% was of other histologic types. Among the other types, adenocarcinoma was only 8.1%. Moreover, primary tracheobronchial neoplasms have various histological features. They can arise from the respiratory epithelia, salivary glands, and mesenchymal structures. Hishida, et al. reported five cases of centrally located adenocarcinoma with endobronchial polypoid growth. In that report, 3 cases had a papillary, acinar, and solid structure. The other two cases had a mucin-filled glandular and cystic structure resembling mucoepidermoid carcinoma. In the present case, papillary proliferation of atypical epithelial cells was seen lining the bronchus and submucosal glands; it was also seen in the smooth muscles of the bronchial wall. Thus, a diagnosis of bronchial adenocarcinoma was made in this case.

Tracheal and bronchial tumors are usually misdiagnosed as bronchial asthma or chronic lung disease and require several months to make the correct diagnosis because the tracheal lumen has a large functional reserve, and the tumors do not cause symptoms until they occlude 50%–75% of the lumen diameter. In the present case as well, the patient was diagnosed as having bronchial asthma for 7 months. We recommend that chest CT should be performed when chronic symptoms are sustained because it is difficult to detect tracheal tumors by chest X-ray alone.

There have been some techniques for palliation of bronchial obstruction or stenosis, including Nd-YAG laser, electrocautery, cryosurgery, debulking with rigid bronchoscopy, and so on. Sagawa, et al. reported successful resection of endotracheal papillary adenocarcinoma by endoscopic electrosurgery using a new snare designed for the respiratory tract under local anesthesia. We agree that flexible bronchoscopy without general anesthesia is less invasive for patients. However, we usually prefer rigid bronchoscopy in central or proximal airway obstruction because rigid bronchoscopy allows us to perform the procedure more safely if massive bleeding or hypoxia occurs during tumor resection. For example, Nakamura, et al. reported that they resected primary adenocarcinoma of the trachea using percutaneous cardiopulmonary bypass support. The palliative resection in the present case was useful because it allowed the location and extent of the tumor to be determined, after which curative pulmonary resection and lymphadenectomy could be performed. In addition, the palliative resection helped the patient recover pulmonary function and, as a result, preserve the lower lobe.

In the treatment of this adenocarcinoma, needless to say, surgical resection, if it is indicated, has the potential to cure and reduce the risk of asphyxiation. As we have reported previously, bronchoplasty is useful for the treatment of patients with lung cancer, especially stage I or II patients. This case also underwent successful middle lobe sleeve lobectomy with checking the bronchial stumps several times. Radiotherapy is also indicated as adjuvant therapy after resection of tumors that are unresectable or medically inoperable, as for other common neoplasms. However, little data are available for this modality. Moreover, chemotherapy has not yet been assessed prospectively in primary tracheal tumors.

**Conclusion**

We should be aware of the possibility of tracheal or bronchial tumors in patients who have prolonged asthma-like symptoms. Palliative tumor resection by rigid bronchoscopy was useful to make the correct diagnosis and evaluate the extent of the tumor, after which curative pulmonary resection and preservation of lung function were successfully accomplished.

**Disclosure Statement**

The authors have no personal conflict of interest and no outside support for this research.
References