

# Video-assisted Thoracoscopic Right Inferior Lobe Resection for Bronchial Mucoepidermoid Carcinoma in a 10-year Child

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## ABSTRACT

Bronchial mucoepidermoid carcinoma is a rare disease in the field of thoracic surgery, and it is even more rarer in children. A 10-year Chinese child whose chief complaint was intermittent fever and cough for one year was referred to our hospital. Based on the imaging, pathology and immunohistochemistry findings, the patient was diagnosed with right inferior lobar bronchial mucoepidermoid carcinoma; and was treated with video-assisted thoracoscopic (VATS) right inferior lobe resection and had a good prognosis.

**Key Words:** *Mucoepidermoid carcinoma, Child, Lobe resection, VATS.*

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## INTRODUCTION

Bronchial mucoepidermoid carcinoma is rare in clinical practice, accounting for 0.1- 0.2% of primary lung cancers.<sup>1,2</sup> This disease is even more rare in children.<sup>2</sup> Bronchial mucoepidermoid carcinoma is a low-grade malignant epithelial tumour that originates from bronchial mucinous glands and consists of mucinous cells, squamous cells and intermediate cells.<sup>1,3</sup> Unlike other malignant tumours, the younger the age of onset, the lower the grade of malignancy.<sup>1</sup> Surgical removal is the treatment choice for this disease.<sup>3</sup> Clinically, most patients choose to undergo bronchoscopy to remove tumours but this method is only applicable for patients with tumours located in the main bronchus; and it cannot be removed, if located in the distal parts of the bronchus. In addition, this treatment also makes it difficult to perform lymph node dissection around the tumour.<sup>3,4</sup> Tumours located in the inferior lobe of the lung have been treated by thoracotomy. However, thoracotomy causes great trauma, and is not conducive to the recovery of patients after surgery.<sup>3,4</sup>

Herein, we report a rare case of a 10-year child with right inferior lobar bronchial mucoepidermoid carcinoma who underwent video-assisted thoracoscopic (VATS) right inferior lobe resection and lymph node dissection around the lesion.

## CASE REPORT

A 10-year boy was referred to our hospital in May 2017, and his chief complaint was intermittent fever and cough for one year. Chest CT showed a lobulated mass with a maximum diameter of 25 mm and mild atelectasis in the inferior right lung with enlargement of the mediastinal and hilar lymph nodes (Figure 1-A). Fiberoptic bronchoscopy showed chronic tracheitis, bronchitis and a bronchial nodular blockage in the basal segment of the right inferior lung (Figure 1-B). Fiberoptic bronchoscopic biopsy showed that the nodule to be well differentiated mucoepidermoid carcinoma (Figure 2-A). Immunohistochemistry revealed positive expression of CK 7 (+) (Figure 2-B), CK 5/6 (+) and P 63 (+).

The surgical plan was to perform VATS to remove the tumour and clean the surrounding lymph nodes in the adjacent tissue. First, the child was placed in a left lateral position, and a single lumen endotracheal tube was placed for general anaesthesia. The right main bronchus was occluded with an occluder. A television monitor was placed at the head end of the child, and a 10 mm, 30° thoracoscope was chosen. Then, a small incision of 1 cm was made in the mid-axillary line at the 8th intercostal space on the right side, and the trocar and thoracoscope were inserted carefully (Figure 1-C). The operative incision was selected at the anterior axillary line of the 5th intercostal space and was approximately 3 cm long (Figure 1-C). The tumour was found in the basal trunk of the inferior lobe of the right lung with a maximum diameter of 25 mm. The right inferior lobe of the lung was resected anatomically. The right lower pulmonary basilar artery and the dorsal segment artery were clipped with vascular clips and then severed. The right lower pulmonary vein and the right lower pulmonary lobar bronchus were resected with Endo GIA.

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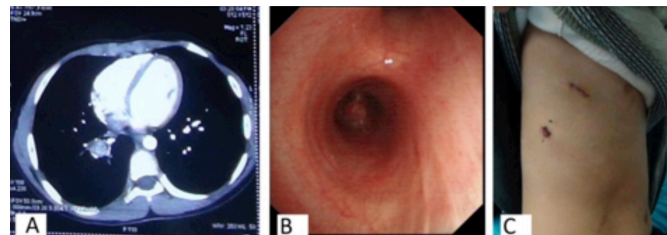
No residual cancer cells were found in the bronchial stump by frozen section pathology during the operation. Then, the enlarged lymph nodes in groups 9 and 11 were cleaned. During the operation, a bulge (maximum diameter 7 mm) on the oesophageal wall was found (preoperative CT showed enlarged lymph nodes under the carina). Intraoperative gastroscopy showed that the oesophageal mucosa was smooth and free of bulges. Then, the oesophageal muscle layer was cut open, and the pathological tissue was stripped off; the frozen section pathological examination revealed lymphoid tissue. Next, the opened oesophageal muscle layer was sutured intermittently. A closed thoracic drainage tube was placed in the thoracoscopic exploration hole during the operation and removed three days later. The postoperative pathological biopsy results suggested that the oesophageal bulge was lymphoid tissue, and no cancer tissue was found at the resection margin of the bronchus. The right inferior lung lesion had mucoepidermoid carcinoma of low-grade and no lymph node metastasis. The patient recovered well and was discharged six days later without radiotherapy or chemotherapy but was followed up every three months after the operation, and he recovered well; no recurrences were found in the follow-up.

## DISCUSSION

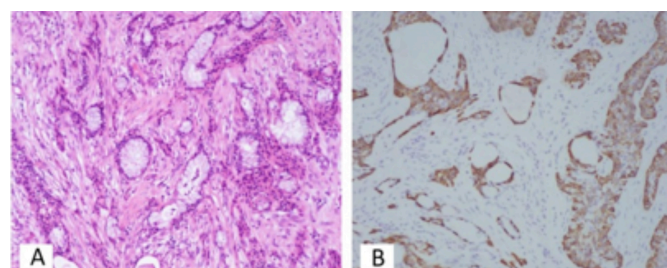
Bronchial mucoepidermoid carcinoma is an extremely rare disease in clinical practice.<sup>1</sup> It is a low-grade malignant epithelial tumour that originates from bronchial mucinous glands and consists of mucinous cells, squamous cells and intermediate cells.<sup>3</sup> Abundant mucus cells indicate a low degree of malignancy.<sup>3</sup> In contrast, abundant epidermal-like cells indicate a high degree of malignancy.<sup>3</sup> At present, it is generally believed that the younger the age of onset, the lower the degree of malignancy.<sup>3</sup> In total, 96% of patients, younger than 16 years, have low-grade malignancies; and 51% of patients younger than 30 years, have low-grade malignancies.<sup>4</sup> This disease mainly occurs in the large bronchus, and is rare in the small bronchi.<sup>5</sup> The tumour is usually round, oval or lobulated and grows in a strip-like shape along the long axis of the trachea; some tumours with a high degree of malignancy may show invasive growth.<sup>4,5</sup> Clinical symptoms depend on the tumour size, tumour location, etc.<sup>3-5</sup> When the tumour is small, patients do not have significant clinical symptoms. When the tumour is large, and as the airway is obstructed, patients often experience manifestations such as cough, expectoration, haemoptysis and shortness of breath.<sup>5,6</sup> Due to atypical clinical symptoms and extremely low incidence, this disease is often misdiagnosed.<sup>1,7</sup> However, since the disease mainly occurs in bronchi, fiberoptic bronchoscopy has great value in the diagnosis of this disease, with a positive biopsy rate of approximately 85%.<sup>6</sup> In addition, chest CT examinations are also very helpful.<sup>7</sup>

Surgery is the treatment of choice for this disease.<sup>3-5</sup> Even with palliative resection, patients can survive with these tumours for many years.<sup>5</sup>

As most of the tumours are low-grade malignancies, the normal lung tissue should be preserved as much as possible during the operation.<sup>4</sup> Bronchoplasty can be used to ensure radical resection of the tumour.<sup>4</sup> Lymph node dissection should be routinely performed due to the possibility of metastasis.<sup>3-4</sup> The effects of radiotherapy and chemotherapy are not significant.<sup>5</sup>



**Figure 1: (A) Thoracic CT scan of the patient. (B) The location of the mass on bronchial fibroscopy. (C) Location of the surgical incisions on right chest wall.**



**Figure 2: (A) Histological findings from the lung biopsy showing highly differentiated bronchial mucoepidermoid carcinoma with mucin-secreting cells and intermediate cells (haematoxylin-eosin stain, HE×200). (B) The tumour cells were positive for CK7. (CK7, ×200).**

In this case, as the tumour was located in the basal segment, we used VATS for right lower lobe resection and lymph node dissection. Anaesthesia was administered through the use of single lumen endotracheal intubation and an occluder to occlude the right main bronchus, effectively realising single lung ventilation (SLV). Due to the shallow thorax of paediatric patients, obtaining sufficient space and exposure for VATS is more difficult than in adults. Therefore, the operation hole was placed at the anterior axillary line of the 5th intercostal space on the right side; and the observation hole was placed at the mid-axillary line of the 8th intercostal space on the right side, which increases the distance and facilitate the operation (Figure 1C).

Overall, bronchial mucoepidermoid carcinoma is often misdiagnosed due to its low incidence, slow development, and atypical symptoms. CT is helpful for diagnosis. Compared with CT, PET/CT has no special advantages. Fiberoptic bronchoscopy has a high positive rate and is of great value, but it is sometimes difficult to perform in paediatric patients. Surgery is the main treatment. The surgical method should be minimally invasive and should be aimed to preserve as much the lung tissue as possible. The lymph nodes should be routinely cleaned. Thoracoscopic surgery should be the first choice for patients who do not need bronchoplasty.

Video-assisted thoracoscopic lobectomy for children requires one-lung ventilation, and the operation space should be

maximised as much as possible to facilitate the operation.

**ETHICAL APPROVAL:** The study was approved by the Ethics Committee of Chongqing General Hospital, China.

# **PATIENT'S CONSENT:**

Written informed consent was obtained from the patient and his family.

# **CONFLICT OF INTEREST:**

The author declared no conflict of interest.

# **AUTHOR'S CONTRIBUTION:**

FY: Data collection and article writing.

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