

# Bronchial Mucoepidermoid Carcinoma Misdiagnosed as Adenocarcinoma. A Word of Caution

Adil Hashim Al Kindi, Sara Al Adawi, Fathiya Al Rahbi, Abdelmegeed Salem and Faiza  
Abdullah Al Kindi

Cardiothoracic Surgery, Sultan Qaboos University Hospital

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\*Corresponding author: [adil.h.alkindi@gmail.com](mailto:adil.h.alkindi@gmail.com)

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## Abstract

Tracheobronchial mucoepidermoid tumors (MET) typically occur in the head and neck region but rarely in the trachea and lung. They are salivary-type tumors that arise from the glandular component of the tracheobronchial epithelium. The most common type, mucoepidermoid carcinoma (MEC) has histological features that overlap with more aggressive lung carcinomas such as adenosquamous-carcinoma. It is important to realize the histological features and limitations of a diagnostic biopsy. This case illustrates this point where an initially diagnosed lung adenocarcinoma turns out to be MEC. We report a case of a 43-year-old lady with a one-year history of recurrent episodes of cough and fever. Initial bronchial biopsy diagnosed her as having adenocarcinoma of the lung. However, her surgical biopsy confirmed it was MEC. High clinical suspicion that the diagnosis may not have been correct saved her from a potential pneumonectomy. She instead underwent bi-lobectomy sleeve resection. This case illustrates the importance of recognizing less common and less aggressive tumors of the lung that may appear histologically as adeno-squamous carcinoma. High clinical suspicion, not only biopsy results, from clinical history, imaging and gross appearance is always needed in all cases. The use of intraoperative frozen section is mandatory. It is important to be aware that because of morphological limitations of small endobronchial biopsies, diagnosis of a more common pathology maybe favored.

**Keywords:** mucoepidermoid carcinoma (MEC) adenosquamous-carcinoma Sleeve Resection Thoracic Cancers;

## Introduction

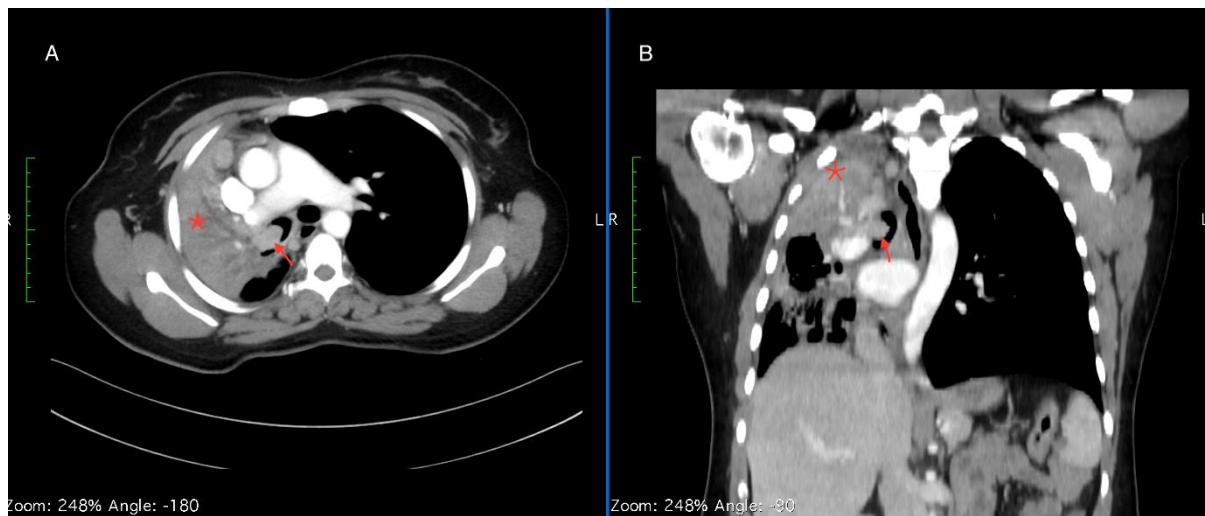
Salivary gland tumors are a rare cause of tracheobronchial tumors. The most common type, Mucoepidermoid Carcinoma (MEC), generally presents with symptoms of airway obstruction. They are a rare cause of lung tumors and it is important to differentiate them from other more aggressive tumors<sup>1,2</sup>.

We present a case of a young lady with MEC who was initially mistakenly diagnosed with adenocarcinoma of the lung and why it is important to correlate biopsy results with clinical picture because of possible diagnostic limitations.

## Case report

A 43-years-old lady with no risk factors presented with recurrent episodes of productive cough and fever for one year. The sputum was white but occasionally green and with no blood. Her cough was associated with episodes of fever and malaise. She was treated several times with antibiotics. She was not a smoker, had no exposure to tuberculosis and animals and denied prior travel.

CT-scan showed a mass in the right main bronchus, right upper lobe collapse and enlarged mediastinal lymph nodes (Figure 1). Endo-bronchial tumor of unknown type was suspected.



**Figure 1:** CT scan of the chest with axial (A) and sagittal views demonstrating an endobronchial mass (arrow) and collapse of the right upper and middle lobe (\*). The images also demonstrate mediastinal shift to the right side and mediastinal lymph node enlargement.

She then had bronchoscopic biopsy and PET-scan. Biopsy was reported as adenocarcinoma of the lung. PET-scan showed uptake only in the mass with no distant disease.

Patient then presented to our center. She only had a report indicating a diagnosis of adenocarcinoma of the lung. Slides were not obtainable as the biopsy was done abroad. Since the mediastinal lymph nodes were significantly large, they were biopsied and showed reactive hyperplasia with no evidence of malignancy.

She was staged as T2N0M0 adenocarcinoma of the lung. The plan was to surgically resect the tumor with lobectomy and mediastinal lymph node dissection (MLND)

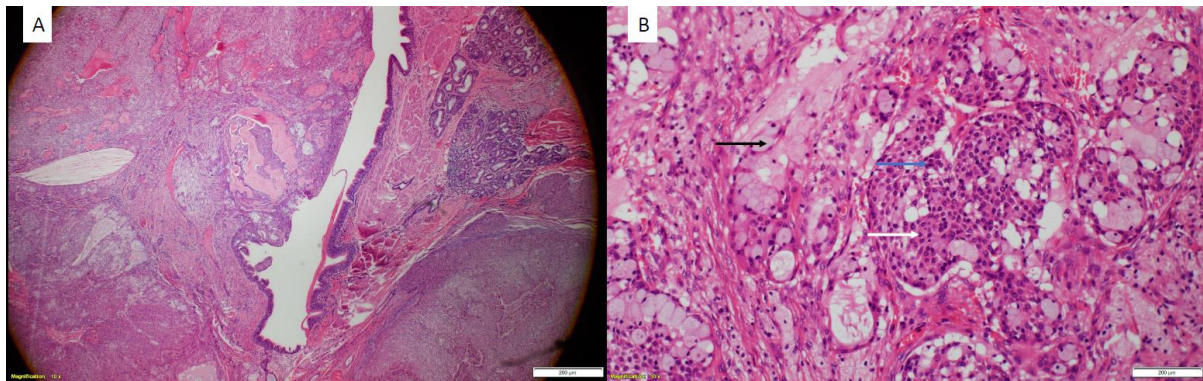
Intraoperative, bronchoscope was done by the surgeon. It showed a smooth mass occupying the right upper lobe bronchus bulging into the right main bronchus. It did not have the typical appearance of bronchial adenocarcinoma. This appearance together with the very indolent, slow clinical history and negative large mediastinal lymph nodes raised doubts whether the diagnosis of adenocarcinoma was correct.

A right posterior-lateral thoracotomy was performed. The right upper lobe parenchyma appeared very normal and not diseased. The right upper and right main bronchus were cut open, exposing the tumor and allowing it to be resected en-block. It was decided to defer lobectomy as planned and wait for the final pathology as there was now doubt regarding the diagnosis of

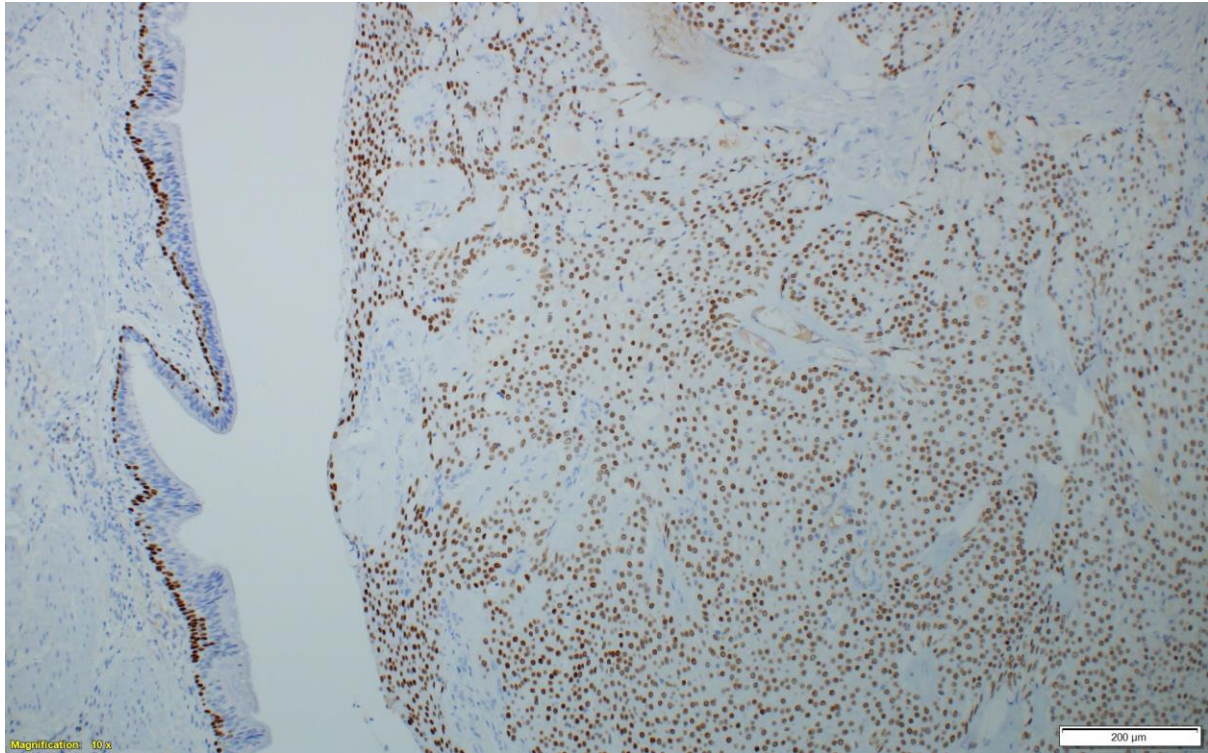
adenocarcinoma. Intra-operative frozen section of the margins came back negative for malignancy. Therefore, sleeve anastomosis of the right lobe bronchi to the main bronchus with preservation of the lung parenchyma was performed. The anastomosis was reinforced with an intercostal muscle flap. Finally, MLND was done.

Her post-operative course was uneventful. At follow up she was doing well and the right lower lobe was fully expanded on CXR.

The final histopathology was surprising. It reported a 35mm malignant neoplasm. The lesion was composed of solid sheets and nests of neoplastic squamous, intermediate and mucin secreting cells with few cystic changes (Figure 2a). Mitotic count was <1 per 10 high powered fields (Figure 2b). Immunohistochemistry stains were positive for p63, CK5/6 and CK 7 but negative for napsin, TTF1 and PDL 1 (Figure 3). Impression was a low grade MEC with no evidence of adenocarcinoma. Lymph nodes were negative for metastasis. Final staging was T2aN0M0.



**Figure 2:** a) Hematoxylin and Eosin stain at x4 magnification showing a polypoid tumor protruding into the bronchial lumen. b) Hematoxylin and Eosin stain at x40 magnification showing tumor composed of a mixture of mucin secreting cells (black arrow) admixed with sheets of squamoid (white arrow) and intermediate cells (blue arrow). These cells lack significant nuclear atypia, mitotic activity and necrosis.



**Figure 3:** P63 immunohistochemistry stain at x 10 magnification showing tumor cells with strong nuclear positivity.

## Discussion

Salivary gland tumors typically occur in the head and neck region but rarely in the trachea, lung and skin<sup>3</sup>. In the pulmonary system, it accounts for less than 1% of primary pulmonary tumors<sup>4</sup>. They arise from the bronchial glands<sup>4,5</sup> and can be divided into three subtypes - mucoepidermoid carcinoma (MEC), adenoid cystic carcinoma (ACC) and epithelial-myoepithelial carcinoma (EMC). MEC is the most common.

Patients with tracheobronchial MEC (TMEC) clinically present with symptoms caused by airway obstruction<sup>3,6</sup>. MEC is not associated with highrisk behaviors such as smoking and industrial exposures<sup>1</sup>. 70.7% of MEC are centrally located, smooth and well circumscribed consisting of solid and cystic components<sup>2,6,7</sup>. Histologically, they are a mixture of mucus-producing, glandular and squamous epithelial cells, as well as intermediate cells at various percentages, and by various growth patterns such as cystic, papillary, and solid. They stain positive for CK5/6, CK7, p53 and p40.

Contrarily, adenocarcinomas are located in the periphery and cells are arranged in an acinar pattern, and stain positive for CK7, TTF-1 and napsin A<sup>3</sup>. In a small biopsy, spectrum of the typical histomorphology may not be present making diagnosis difficult.

High grade TMEC can be difficult to distinguish from adenosquamous carcinoma. Klacsmann *et al*<sup>2</sup> proposed differentiation criteria. In TMEC surface epithelium doesn't show carcinoma-in-situ, and although squamous metaplasia may be present, atypical metaplasia is not present except coincidentally. Cells of both solid and glandular areas have a more uniform, almost bland appearance, unlike bronchogenic carcinoma nuclear features and cytoplasmic variability are pronounced. Large areas of frank keratinization, including abundant individual cell keratinization, is a feature of bronchogenic carcinoma that is not seen in TMEC.

Despite these criteria, significant overlap exists and final diagnosis may not be possible until the final surgical resection. As such in this case, when the clinical history, gross appearance and overall pattern of the disease does not concede with a more aggressive pathology, it is not unreasonable to embark on a less aggressive surgery until the final diagnosis is confirmed from the surgical biopsy. This is especially true in young patients or those with limited lung reserve.

Treatment of pulmonary salivary type tumors is surgical. As most of these tumors are centrally located, the risk of pneumonectomy is very high especially with wrong diagnosis of a more aggressive tumor. Therefore, such tumors require high clinical suspicion and a center that is experienced with parenchymal preserving techniques such as sleeve resections. Radical procedures like pneumonectomy are unnecessary<sup>7</sup>

Complete resection of the tumor provides the only curative therapy<sup>1</sup>. In high grade tumors and those with incomplete resection, adjuvant therapies with chemotherapy or radiotherapy have been added. However, the disease free and overall survival are low<sup>1</sup>. Prognosis depends on the histological grade, TNM staging especially lymph node metastasis and completion of resection<sup>2</sup>. Those with Stage I and II disease are reported to have 100% survival, whereas those with Stage 3 and 4 survival may be as poor 43.6% in 5 years (P<0.001)<sup>1</sup>. The overall risk of recurrence is 22.6%. Recurrence was only seen in high grade and incompletely resected tumors. Incomplete resection recurrence rate is 37.5%.<sup>8</sup>. These results emphasize close follow up in those with high grade tumors or those with incomplete resection.

## Conclusions

MEC is a rare salivary gland type tumor in the respiratory tract. It is important to distinguish it from high grade aggressive tumors to avert unnecessary resection. However, confirmative differentiation from adenocarcinoma may be difficult from preoperative biopsy. Thus, a high degree of clinical suspicion and awareness of histological limitations is necessary for its correct management. .

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