Mucous gland adenoma of a segment bronchus - Case report

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Abstract

Background: Mucous gland adenoma of the bronchus is a rare benign epithelial tumor. The majority arises from the submucosal seromucous glands and ducts of the proximal airways. In bronchus biopsy specimen it might be difficult to distinguish mucous gland adenomas from low-grade malignant tumors, such as carcinoids, mucoepidermoid carcinomas, or adenoid cystic carcinomas. Complete tumor resection serves for both definite diagnosis and potential curative treatment.

Case: A non smoking man of 78 years suffered from cough, dyspnea and recently from hemoptysis. Fiberoptic bronchoscopy revealed a polypoid, well-circumscribed mass in the right posterior segmental bronchus. A bronchoscopic tumor excision was performed.

Histology and immunohistochemistry (IHC): The tumor displayed with exuberant dilated cystic glands lined by columnar, cuboidal or flattened mucus secreting cells. IHC was positive for EMA, CKAE1/AE3, and negative for TTF1.

Conclusion: Uncommon benign bronchus adenomas should be taken into account in addition to the common malignant lung carcinomas with endobronchial growth pattern. Endoscopic tumor excision of bronchus adenomas is indicated for potential curative treatment, especially in patients of higher age.

Keywords: Bronchus adenoma; endoscopy; immunohistochemistry; video-assisted thoracic surgery; prognosis.

Virtual Slides: www.diagnosticpathology.eu/vs/2015_1_8/
Introduction

Mucous gland adenoma of the bronchus is a rare, solitary, well-circumscribed, multicystic, predominantly exophytic bronchus tumor. The tumor has been suggested to originate from the submucosal seromucous glands of the proximal airways. In addition, it may be found in the trachea and in the peripheral lung tissue, herein presenting as circumscribed peripheral nodule (1-4). There are no sex or age predilection. The patients may be asymptomatic, or may present with clinical signs and symptoms of bronchial obstruction, reflecting to the central location of the tumor. This tumor is benign. Malignant variants have not been reported.

Case report

A 78-year-old man, non-smoker, no characteristic medical history was transferred to our hospital due to cough, dyspnea and hemoptysis. Radiological findings proved to be inconclusive. Fiberoptic bronchoscopy revealed a polypoid, well-circumscribed mass in the right posterior segment bronchus. The tumor projected into the lumen and was attached to the bronchial wall with a broad base. The tumor measured approximately 1 cm in maximum diameter. It was completely removed by bronchoscopic excision. The tumor measured 10×4 mm in maximum diameter. It presented with a grayish, shiny and firm cut surface and with multiple disclosed small cystic spaces. Microscopically, the tumor boundary was distinct and surrounded by respiratory epithelium. The tumor itself was composed of exuberant dilated cystic glands (Figures 1 and 2). The glands were lined by bland columnar, cuboidal or flattened mucus secreting cells (Figures 3 and 4). No mitotic figures could be noted. The intervening stroma consisted of connective tissue with scanty infiltrates of lymphocytes and plasma cells. The mucoid material in the dilated glandular structures stained positively for Alcian blue pH 2.5 (Figures 5 and 6).

The immunohistochemical investigation was performed with a panel of antibodies using the labeled streptavidin biotin-peroxidase complex method and in accordance to the manufacturer’s instructions (LSAB Kit, Dako, Glostrup, Denmark). The applied primary antibodies included mouse monoclonal antibodies for cytokeratin (CK; clone AE1/AE3), Ki 67 antigen, (clone MIB-1), epithelial membrane antigen, (EMA, clone E 29), thyroid transcription factor-1 (TTF-1, clone 8G7G), and carcinoembryonic antigen (CEA, clone II-7). Visualization was performed with 3, 3'-diaminobenzidine (DAB). The slides were slightly
counterstained with Meyer’s haematoxylin. All reagents were acquired from Dako (Glostrup, Denmark). The epithelial cells displayed with intensive staining for EMA, CKAE1/AE3 and CEA. The Ki-67 proliferation index was estimated less than 1% (Figure 7). IHC for TTF-1 was negative.

Based on the morphological and immunohistochemical features, the diagnosis of mucous gland adenoma was established. The endoscopic tumor resection was successful and without complications. The patient is alive and of good health nine months after the tumor excision.

Figure 1. Mucous gland adenoma. (H&E, x2.5).

Figure 2. Mucous gland adenoma. A tumor composed of exuberant dilated cystic glandular structures (H&E, x4).

Figure 3. The glands are lined by columnar and cuboidal cells (H&E, x20).
Figure 4. Glands are lined by flattened mucus secreting cells (H&E, x40).

Discussion

Mucous gland adenoma is an uncommon entity and represents a genuine adenoma of salivary gland type. Ten cases reported by England and Hochholzer (1995) [1] represent the largest data set with subsequent rare individual cases [2-9]. Most tumors originate from the submucosal glands of the larger bronchi in contrast to our case of a rare mucous gland adenoma located in a segmental bronchus.

Clinical manifestations of the tumor include cough, dyspnoea and hemoptysis, which are induced by the endoscopic and obstructive tumor growth. Fever, wheezing with recurrent bronchitis, pneumonia or chronic obstructive pulmonary disease have been reported too [6-9]. The chest X-rays may be normal, similar to our case, or correspond to a nodular lesion or indicate atelectasis [8].
On gross examination, the tumor mass of our patient is shiny, firm and cystic, as described by other authors [3, 7]. Histologically, tumor is composed of glandular, tubulocystic or papillocystic structures, which are the characteristic diagnostic features of these neoplasms. In our case, the low-power microscopic image shows an exuberant dilatation of the submucosal glands frequently filled by mucoid material. Cystic contents are either overtly mucinous (in current case Alcian blue positive) or more serous [1]. Papillary structures are missing.

Fiberoptic excision of bronchus adenomas is the primary choice of treatment. It might be not curative especially in larger tumors [8]. Our case of mucous gland adenoma could be definitely diagnosed and potentially cured by endoscopic excision, a technique which has been introduced in the recent years [10].

The results of our IHC investigations are consistent with those reported in the literature. The tumor cells stained positively for CKAE1/AE3, CEA and EMA in agreement with the staining behavior of normal mucous gland cells. The Ki-67 proliferation index is low and can be estimated less 1%. The epithelial cells of the mucous gland adenoma lack TTF-1 expression, in agreement with previously reported cases [4, 5, 7, 9]. Analysis of TTF-1 expression is useful for distinguishing benign salivary gland-type adenomas from common malignant bronchus carcinomas.

Low-grade mucoepidermoid carcinoma is an important differential diagnosis [11]. Its histological features are similar. As a hallmark, mucous gland adenomas often stop their growth at the collagenous tissue in front of the bronchus cartilage in contrast to
mucoepidermoid carcinomas which often invade beyond the cartilage. In addition, epidermoid and intermediate mucoepidermoid carcinoma cells are absent in mucous gland adenoma. Less frequently, carcinoids, mucinous cystadenomas and cystadenocarcinomas may be morphologically similar to bronchus adenomas. Basically, they share macroscopic morphological features and endobronchial growth pattern (carcinoids) with adenomas; however. Less often microscopic features, or occur in the peripheral (subpleural) lung parenchyma rather than within the bronchi [12]. Common lung carcinomas, especially large cell or adenocarcinomas might be mistaken for bronchus adenomas. However, these malignant neoplasms growth infiltrative and present with marked cellular atypias, mitoses, moderate to high Ki-67 proliferation index, and necrosis [11]. Missing malignant characteristics, especially mitosis, hemorrhage, necrosis, invasion, and low Ki-67 proliferation index characterize this tumor as a completely benign lesion. In small biopsies, one should focus on presence of an exuberant dilatation of glands and acellular mucoid material within the glandular lumen that should lead to the correct diagnosis [13, 14].

**Conclusion**

Mucous gland adenoma is an extraordinarily rare entity, when occurring in a segment bronchus. The clinical symptoms of these tumors are induced by their endobronchial growth and often indistinguishable from those of malignant tumors. Potential curative endoscopic tumor resection in combination with IHC will guide to adequate diagnosis. The patients’ prognosis is favorite in these cases.

**References**


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