Mucoepidermoid bronchial tumors: a review of 34 operated cases

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Abstract

Objective: Pulmonary mucoepidermoid tumors are commonly included with adenoid cystic carcinoma and carcinoid tumors under the misleading rubric ‘bronchial adenomas’. These neoplasms are extremely rare and little is known about their oncologic behaviour. They are considered to be of high, or low malignancy. Methods: During a 16-year-period 34 consecutive patients (24 male and 10 female with an average age of 53 years) underwent surgery for pulmonary mucoepidermoids in our clinic (0.5\% of all resected lung tumors). Fourteen patients were complaint free, in the others obstructive symptoms dominated. In 23 patients the tumors were located in the upper lobes. In 24 cases lobectomy, in four instances limited resection and in six cases pneumonectomy were performed without hospital mortality. Results: Twenty-nine tumors proved to be high grade and five low grade malignancy by histology. In the latest group the 5-year-survival amounted to 80\% (all of these tumors were observed in stage T1-2 N0), on the other hand, however, that rate accounted only 31\% at high grade malignant mucoepidermoids. There was no 5-year-survivor among patients having N2-disease (n = 5). Conclusion: Mucoepidermoid tumors have to be treated by radical surgery with lymph node sampling and dissection. Patients with low grade tumors can be expected to be cured following complete resection, on the other hand, however, in cases of high grade malignant neoplasms surgery results in significantly worse prognosis. Careful histological typing plays a key role in prediction of late results. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

Previously pulmonary mucoepidermoid tumors were usually mentioned with adenoid cystic carcinoma and carcinoid tumors as ‘bronchial adenomas’. This time it is clear—according to WHO classification—these neoplasms make a distinct entity among pulmonary malignancies. Although their growth rate is often indolent, local invasion and lymph node metastases may ultimately occur, and, in some cases, biologic behaviour is aggressive. These neoplasms are extremely rare and little is known about their oncologic characteristics. Based on our 34 operated cases, the aim of present paper was to analyse retrospectively and explain our experience and opinion about oncopathological features of pulmonary mucoepidermoids.

2. Materials and methods

Between 1977 and 1992 34 consecutive patients were operated on for pulmonary mucoepidermoid tumor at the Thoracic Surgical Clinic in Budapest. These tumors accounted for 0.5\% of all resected pulmonary neoplasms in that period. There were 24 male and ten female patients, their average age was 53 years, range 34–70 years. Obstructive symptoms and/or hemoptysis dominated in 20 patients and the others were free of symptoms detected accidentally. Twenty-three tumors were located in the upper lobes. In six cases the tumor could be seen as peripheral nodule and in the other patients infiltrate, partial atelectasis or hilar mass were observed on radiography. In 21 cases the neoplasm was visible on bronchoscopy. Altogether the preoperative microscopical diagnosis was exact in six cases, but in the others (n = 28) that was wrong or inaccurate: squamous cell carcinoma (n = 9), adenocarcinoma (n = 3), ‘bronchial adenoma’ (n = 4), non typed malignant tumor (n = 6).

Six neoplasms could not be verified prior to surgery. Four limited resections, 24 lobectomies and six pneumonectomies were performed with lymph node sampling. Pathological confirmation was based on routine light-microscopic sections stained by hematoxylin-eosin. Histology was controlled carefully retrospectively in every case. All patients were controlled regularly by the Hungarian Pulmonary Network. Statistical analysis of survival following surgery was made by GraphPad Prism 2 program.
3. Results

The postoperative (30 day) mortality rate was 0%. Minor complications occurred in ten patients.

Pathological examination showed low grade malignancy in five tumors. All of these neoplasms were observed in stage T1-2 N0. They were removed by lobectomy (n = 4), or limited resection (n = 1). The 5-year survival amounted to 80% in this group (Table 1).

Twenty-nine tumors proved to be high grade malignancy by histology. All of them were in stage T1-2. Sixteen neoplasms had no regional lymph node involvement and the 5-year survival of these patients was 44%. Eight tumors gave hilar lymph node metastasis (N1) resulting in 25% 5-year survival rate. In five cases mediastinal lymph node involvement (N2) were observed, and there was no 5-year survivor among these patients. Altogether the 5-year survival rate of the patients having high grade malignant mucoepidermoid tumors accounted only 31%.

(The causes of death proved by clinical and/or pathological examinations were liver, bone and brain metastases).

4. Discussion

Mucoepidermoid tumor, first reported by Smetana et al. [1] is an uncommon lesion that accounts less than 1% of primary malignant bronchial tumors. The largest series (56 cases over 26 years) was published by Yousem [2]. Previously these neoplasms were variously labeled 'adenomas' or 'carcinomas'. The spectrum of microscopically similar tumors includes rare, mucous gland adenoma-like neoplasms as well as frank epidermoid carcinomas. The limited number of cases available for review would not allow for significant clinical observation to be made.

Pulmonary mucoepidermoid is morphologically similar to the mucoepidermoid tumor of the salivary glands. It is still unclear whether this neoplasm originates from the bronchiolar epithelium or bronchial glands [3]. Mucoepidermoid tumors are composed of varying mixtures of clear non mucus-secreting columnar cells and mucus-rich goblet cells along with basoloid, transitional, and epidermoid cells. Mucus is present either extra- or intracellularly. They are classified as high grade or low grade mucoepidermoi ds on the basis of their histologic appearance [4].

Low grade malignant tumors have mostly cystic components. Microscopic invasion into pulmonary parenchyma is unusual. Mild cytologic atypia can be seen, mitoses are rare. Metastasis to regional lymph nodes is distinctly unusual (Fig. 1).

High grade tumors more commonly show areas of solid growth. Atypia, mitotic activity and necrosis are characteristic and regional lymph node involvement is more frequent at these tumors. This high grade variant occasionally can be difficult to distinguish from adenosquamous carcinoma. Klacsmann [5] proposed several criteria by which this differentiation can be made. In mucoepidermoid tumors the surface epithelium does not show in situ carcinoma, and although squamous metaplasia may be present, one would not expect to find atypical metaplasia, except on a coincidental basis. The cells of both solid and glandular areas of the tumor often have a more uniform, almost bland appearance which differs from that usually seen in bronchogenic carcinoma in which the malignant nuclear features and cytotoxic variability are usually more pronounced. Large areas of frank keratinization, including abundant individual cell keratinization, is a feature of bronchogenic carcinoma that is not seen in the mucoepidermoid tumor of the lung. (Fig. 2).

Concerning the sex incidence and average age of the patients, experience is not uniform. Several cases are reported in children [6–8]. Many patients present with cough, dyspnea, wheezing, hemoptysis or obstructive pneumonia, sometimes it can mimic that of bronchial asthma [9]. Mucoepidermoid tumors rarely present as an isolated peripheral pulmonary nodule. The ratio of high grade and low grade variants is different in the several publications. Among cases of Ozlu [10] there were three high grade and one low grade tumors. Turnbull [11] published 12 cases: all of them considered to be high grade variant. (In our material as well high grade mucoepidermoids dominated: 29/5).

It seems that surgical resection is the only effective treatment of choice. The role of irradiation is undefined and no data are available concerning the efficacy of chemotherapy. According to some opinions [12,13] these treatments are ineffective.

In our experience, patients with low grade mucoepidermoids can be expected to be cured following complete resection, their 5-year survival rate amounted to 80%. On the other hand, however, in cases of high grade malignant neoplasms surgery results in significantly worse prognosis (in our material: 31% 5-year survival). It seems that survival correlates with the presence of regional lymph node metastasis.

Mucoepidermoid pulmonary tumors – as real carcinomas – have to be treated by complete surgical resection with...
lymph node sampling and dissection. Careful histological typing plays a key role in prediction of late results.

References


Fig. 1. Microscopical picture of low grade mucoepidermoid tumor.

Fig. 2. Microscopical picture of high grade mucoepidermoid tumor.


Appendix A. Conference discussion

Dr P. van Schil (Edegen, Belgium): In the patients who died during follow-up, did they die of local recurrence or distant metastases?

Dr Vadasz: Distant metastases, bone, liver and brain metastases. There was no local recurrence among these patients.

Dr van Schil: Would you advocate routine mediastinoscopy in these patients?

Dr Vadasz: No.

Dr van Schil: But you had a very poor prognosis in N2 disease?

Dr Vadasz: Yes, high grade malignant tumors are really carcinomas. The prognosis is very poor. That’s why it’s very important to separate safely by histology these two tumor groups within the mucoepidermoid tumor family. There is a very different prognosis.

Dr C. Gebitekin (Bursa, Turkey): How many cases of malignant tumors have you operated on during this period of time?

Dr Vadasz: During this period of time? I have to count it. This was 0.5% of all resected tumors. And we operate 800 pulmonary tumors yearly. I should calculate it. I don’t know exactly during the 16-year period how many tumors we operated on. I have calculated it, but just I cannot tell you.

Dr Gebitekin: And also, has the pathologist controlled all specimens again?

Dr Vadasz: Yes, all the specimens were controlled and checked out again by expert pathologist.

Dr Gebitekin: All were mucoepidermoid tumors?

Dr Vadasz: There were some real adenocancer in this group, and we excluded them. So we hope and we suppose that these tumors are real, mucoepidermoid tumors.

Dr F. Eckersberger (Vienna, Austria): Have you done any adjuvant therapy postoperatively in the N2 disease high grade malignancy?

Dr Vadasz: No.

Dr Eckersberger: Why not?

Dr Vadasz: Because very little is known about the efficiency of the chemo- and radiotherapy in these tumors. There are some publications which don’t propose chemo- and radiotherapy because it’s ineffective on these tumors.

Dr Eckersberger: In spite of the classification high grade malignancy?

Dr Vadasz: Yes.

Dr Eckersberger: I wouldn’t agree.