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Pulmonary Carcinoid Tumor

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ABSTRACT

Background: Pulmonary carcinoid tumor is a low-grade malignant neoplasm comprised of neuroendocrine cells. The aim of this study was to determine the clinical features; radiological and bronchoscopic findings, as well as treatment in patients.

Materials and Methods: The hospital records of 21 patients with pulmonary carcinoid tumor, who admitted to NRITLD between 1995 and 2001, were evaluated.

Results: 19 patients had typical and 2 had atypical carcinoid tumor. Male to female ratio was 1.1. The mean age \pm SD was 39.33 ± 16.31 . Cough (80.9%) was the most common presenting symptom. 16 patients had abnormal chest radiography. The diagnosis was made using bronchoscopy and biopsy. Most of the tumors arose in main bronchi. Surgery with or without endobronchial laser therapy was the treatment of our patients. Lobectomy (47.3%) was the most common procedure.

Conclusion: surgery with or without laser therapy has a favorable outcome in pulmonary carcinoid tumors.

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Key words: Pulmonary carcinoid tumor, Lung, Carcinoid tumor.

INTRODUCTION

Pulmonary carcinoid tumors are considered low-grade malignant neoplasms of the neuroendocrine cells, they are thought that originate from the Kulchitsky's cells of the bronchial mucosa layer. These tumors represent about 1 to 5 percent of all lung tumors (1,2,3). Pathologic evaluation indicates that 90% of these tumors are well differentiated and show a small degree of mitosis, pleomorphism, and necrosis (4).

This type of tumor, which was first described by Hampel, is called typical carcinoid tumor (5).

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The remaining 10%, which is characterized by increased mitotic activity, nuclear pleomorphism, and cellular irregularity is categorized as atypical carcinoid tumor. At the time of diagnosis these types of tumors are usually larger in size and have higher rate of metastasis than typical carcinoid tumors (6,7).

Typical carcinoid tumors usually occur during the fifth decade while the atypical forms appear during the sixth decade of life (8,9,10). Clinical presentations of both types include cough, hemoptysis, and symptoms of bronchial obstruction. However, some patients with peripheral carcinoid tumors are asymptomatic (11,12).

The reports of sex ratio were varied among different studies (7,12,13).

Bronchial carcinoid tumors are rarely accompanied by carcinoid syndrome (less than 5 percent); furthermore, this condition usually manifests as ectopic production of adrenocorticotrophic hormone and occurrence of Cushing's syndrome. Etiology of 1% of all cases of Cushing's syndrome is carcinoid tumor (11,12,14).

Carcinoid tumor usually affects the right lung, and the right middle lobe is the most common site of invasion. However, when the left lung is affected, the tumor is mostly seen in the upper lobe (12). Bronchial carcinoid tumors have variable radiologic characteristics and solitary pulmonary nodule is the most common appearance (15,16).

Surgical resection of carcinoid tumor is the treatment of choice with an excellent survival rate. Nowadays various bronchoscopic methods of treatment, for example Nd-YAG laser, are available. Endoscopic treatment of surgically unresectable tumors performed due to poor general conditions, tumor recurrence, and non-progressive extraluminal lesions (17,18,19). Nevertheless, this method is not considered as a curative method, except in some cases of typical carcinoid tumor, Nd-YAG laser alone, or in combination with surgical treatment results in definitive cure (17,20).

The aim of this study was to review the clinicopathologic and treatment outcome of the patients with carcinoid tumor referred to Masih Daneshvari hospital between 1995 and 2001.

MATERIALS AND METHODS

This study was performed on the existing data of patients with pathologically confirmed carcinoid tumor.

After reviewing the documents, the following data were collected: information regarding age, sex, clinical presentation, history of tobacco consumption,

radiologic appearances, bronchoscopic findings, means of diagnosis, and treatment modalities. The patients were categorized according to the typical or atypical characteristics of the tumor.

RESULTS

A total of 21 patients, consisting of 11 males and 10 females with the mean age ($\pm SD$) of 39.33 ± 16.31 years old (ranging between 13 and 68 years old), were enrolled in our study. 19 patients (11 males and 8 females) had typical carcinoid tumor and 2 females (58 and 61 years old) had atypical carcinoid tumor.

Two out of 19 cases with typical carcinoid tumor had positive history of tobacco consumption, whereas two patients with atypical carcinoid tumor were non-smokers.

The most prevalent symptoms in our patients were cough, hemoptysis, and dyspnea. The prevalence of other symptoms is demonstrated in table 1.

Table 1. Mode of presentation in patients with pulmonary carcinoid tumor.

Presenting symptoms	Patients No. (%)
Cough	17(80.9%)
Hemoptysis	13(61.9%)
Dyspnea	11(52.4%)
Chest pain	6(28.6%)
Fever	6(28.6%)
Weight loss	5(23.8%)
Night sweating	3(14.3%)

Only one female (4.7%) was diagnosed as carcinoid syndrome. She was a 58-year-old patient who was initially suspected of Cushing's syndrome, but due to positive history of hypertension and suggestive paraclinical laboratory results, the patient

was eventually diagnosed as atypical carcinoid syndrome.

16 patients (76.2%) had abnormal chest X-ray findings such as mass, collapse, atelectasis, bronchiectasis, and effusion. Pulmonary parenchymal mass was the most prevalent finding in CT-scan evaluation. Table 2 demonstrates the prevalence of CT-scan findings in the patients.

Table 2. CT- scan finding

CT- Scan Reports	Patients No.
Mass	11
Infiltration	2
Pleural effusion	3
Collapse consolidation	6
Others	5

Diagnosis was based on biopsy specimen. No hemorrhage was reported during the biopsy taking with bronchoscope. Bronchoalveolar lavage(BAL) fluid was negative for malignancy in all of the patients.

According to bronchoscopy results, the majority of pulmonary carcinoid tumors in our patients were located in the right lung. (Table3)

Table 3. Site of origin of carcinoid tumors (bronchoscopic report)

Site	Patients No.(%)
Right lung	11(52.4%)
Main bronchus	6(28.5%)
Intermediate bronchus	1(4.7%)
Upper lobe	1(4.7%)
Middle lobe	2(9.8%)
Lower lobe	1(4.7%)
Left lung	6(28.5%)
Main bronchus	4(19.1%)
Upper lobe	1(4.7%)
Lingula	0(0%)
Lower lobe	1(4.7%)
Trachea	4(19.1%)

In two patients with atypical carcinoid tumor treatment consisted of surgery (one case of lobectomy and one case of tumor resection) accompanied by laser therapy in one and chemotherapy in the other patient. Chemotherapy was performed because of the tumor recurrence 5 months after the lobectomy.

In cases with typical carcinoid tumor all except one case (5.2%) with carcinoid tumor of trachea underwent surgery. This patient was not operated due to poor general condition and a large sized tumor, remarkable decrease in tumor size was seen after 17 sessions of laser therapy.

Surgery was performed for the rest of the patients, which consisted of 9 cases (47.3%) of lobectomy, 4 cases (21%) of pneumonectomy, and 5 cases (26.5%) of tumor resection.

While performing follow-up bronchoscopy in these patients, tumoral vegetation was seen in 11 (57.9%) cases. These cases were promptly treated by laser therapy, which would be continued in some cases.

DISCUSSION

In our study the male to female ratio was 1.1, which is in accordance with similar studies indicating equal occurrence of disease in both sexes.

Some studies have reported the slightly higher occurrence of disease in female gender (2,3,12).

In our patients the mean age, at the time of diagnosis, was 39.33 years old which is similar to most clinical series (2,22,23).

Although most of patients with typical carcinoid tumors had positive history of tobacco consumption, (2,24) none of the patients with atypical carcinoid tumor were smoker in our study.

Since all the patients had central tumors with endobronchial lesions, they were symptomatic. Cough, hemoptysis, and dyspnea were the most common symptoms (12,21,25).

Cytologic examination of bronchial washing is usually unrewarding as a result of the intact bronchial epithelium overlying most proximal tumor (27); occasionally, adequate samples are available for diagnosis (28).

In our study all of BAL samples were negative for malignancy.

Various means of diagnosis were available. For example in centrally located carcinoid tumors endobronchial biopsy was completely safe without significant bleeding (12). Since all of the patients had centrally located lesions, we used endobronchial biopsy as the mainstay of diagnosis.

The right bronchus was prominently affected in our cases. It was contrary to the results which reported by Fink et al. (12) and Ronchod et al. (29) who introduced the right middle lobe, or Okike et al. (27) who reported the right and left lower lobes as the most commonly affected sites.

Surgery was the most common treatment in our study and lobectomy has been performed more than pneumonectomy, which was the same as other studies (12,22,23,26,30).

Endobronchial laser therapy with or without surgery is considered successful in palliative treatment of malignant airway obstruction (17,18).

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