

# Association of Carcinoid Tumor with Bronchiectasis

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**ABSTRACT:** Bronchiectasis refers to a permanent airway enlargement that involves the lungs in either a focal or a diffused manner and it has been classified as cylindrical or tubular varicose, or cystic. Bronchial carcinoid tumors are neuroendocrine neoplasms that can occur in the lungs. In this case presentation, we reported a 35-year-old man admitted to pulmonary ward with massive hemoptysis. In bronchoscopy, right middle and lower lobes contained bright red blood. Bleeding was seen in the left upper lobe after washing. One week later, left upper lobectomy was done. In pathology of biopsy, bronchiectasis and small focus of neuroendocrine tumor was reported. In the second look bronchoscopy, left main bronchus contained purulent discharge.

**Keywords:** Bronchiectasis, Bronchoscopy, Carcinoid tumor, Neoplasm, Neuroendocrine

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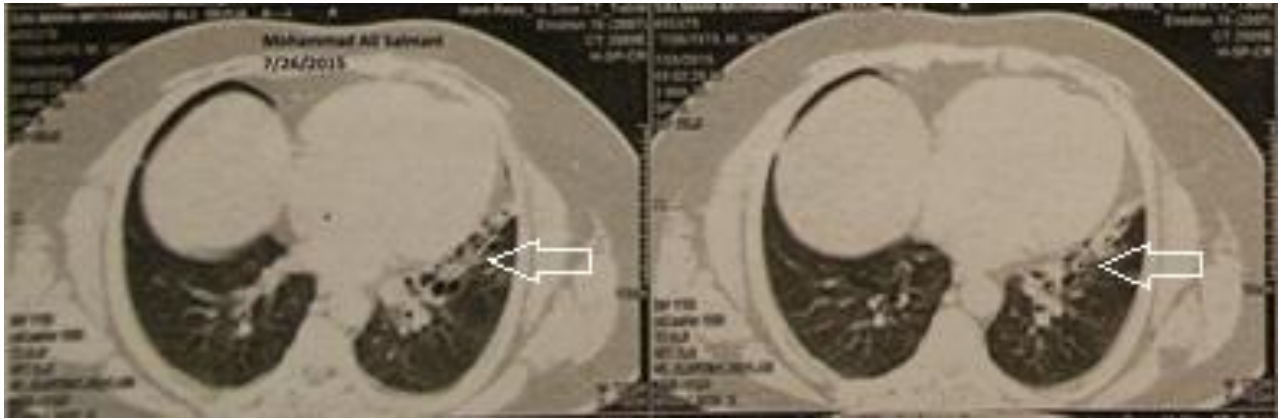
## INTRODUCTION

Bronchial carcinoid tumors are neuroendocrine neoplasms that range from low-grade to aggressive atypical type and demonstrate wide clinical and histologic features (Buck and Sobin, 1990 and Jeung et al., 2002). They can also occur in the lungs, biliary tract, and thymus. Bronchial carcinoids are uncommon and contain only 1-2% of all lung tumors (Godwin, 1975 and Paladugu et al., 1985). Patients with bronchial carcinoids tumor are frequently characteristic with cough, recurrent pulmonary infections and hemoptysis (Dusmet and McKneally, 1996 and Rosado de Christenson M et al., 1999). The most common localized carcinoid tumor occurs in the small intestine and appendix (Mielczarek et al., 2003). Ninety percent of carcinoid tumors are malignant and metastases often distribute to liver and lungs, lymph nodes and rarely to bones, brain and skin (Rymarczyk et al., 2000 and Tiktinsky et al., 2008). Carcinoid's peak incidence varies from decades 5 to 7 (Mielczarek et al., 2003). Hypoxia and exposure to toxic materials such as asbestosis, ozone,

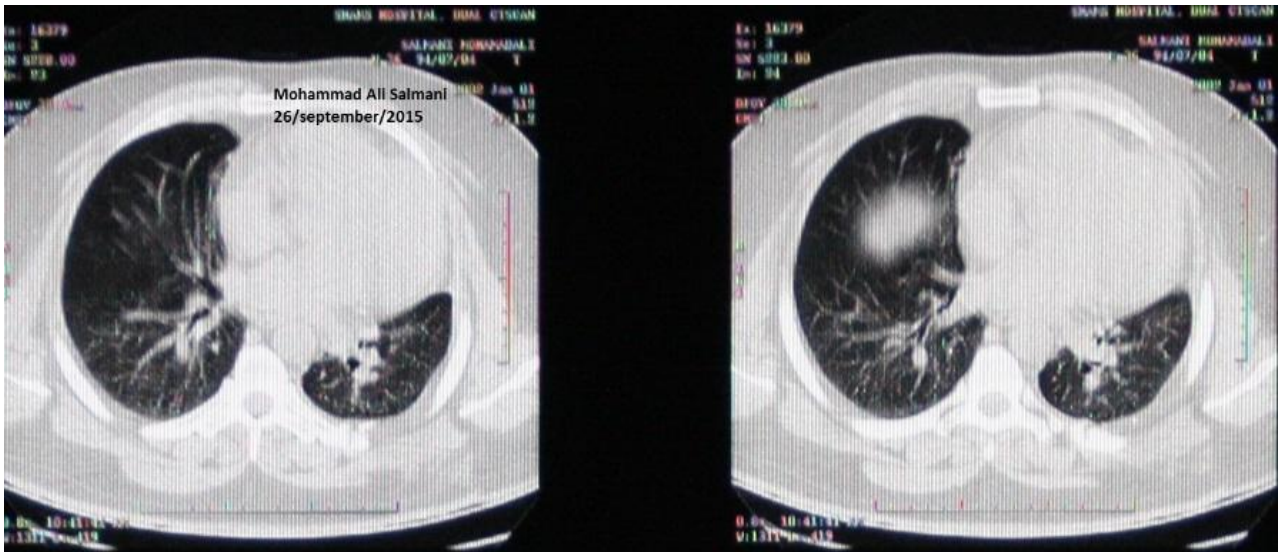
nitrosamine and cigarette smoking may generate hyperplasia of neuroendocrine cells derived peptides in bronchial and bronchiolar mucosa (Aguayo et al., 1989). Association of bronchiectasis and carcinoid tumor in the lung is rare.

## CASE STUDY

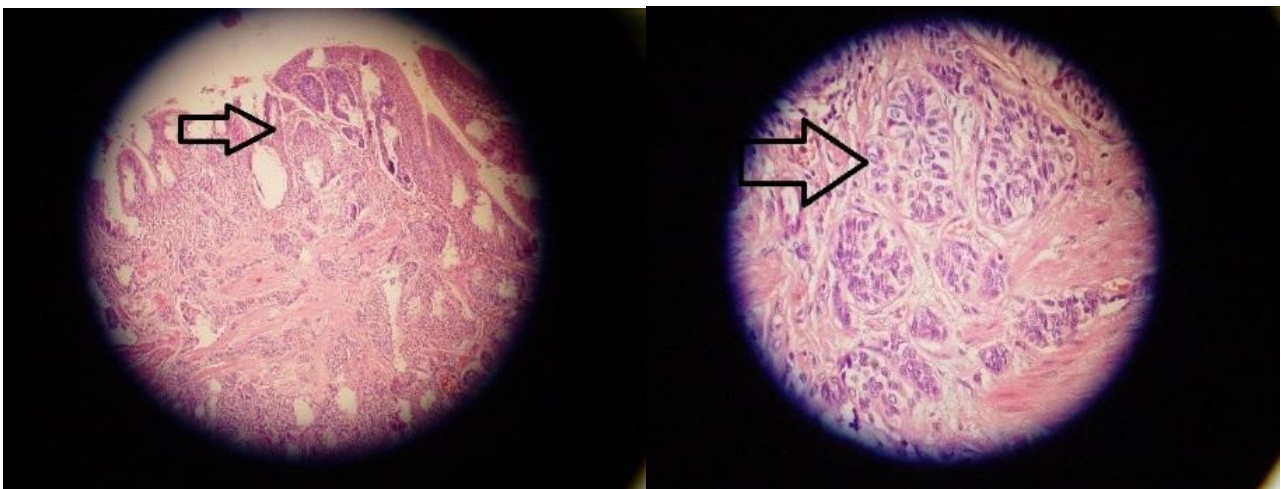
A 35-year-old man was admitted to pulmonary ward of Imam Reza hospital in Tabriz, Iran with massive hemoptysis. He had an episode of hemoptysis one year ago and a history of smoking ten packs of cigarette every day. In the chest CT scan there was bronchiectasis in the left upper lobe (Figure1). In bronchoscopy, nasopharynx and hypopharynx were normal but carina, right upper, middle and lower lobes contained bright red blood. Bleeding was seen in the left upper lobe after washing. One week later, left upper lobectomy was done (Figure 2). In bronchoscopy after surgery, the right lung was normal but the left main bronchus contained purulent discharge. Bronchiectasis and focus of neuroendocrine tumor was reported in pathologic study (Figure 3).



**Figure 1.** Bronchiectasis (white arrows) in left upper lobe in a 35 year-old man with hemoptysis



**Figure 2.** The resolution of bronchiectasis after left upper lobectomy in the same patient



**Figure 3.** Histological findings of the tumor coexisting of a carcinoid tumor and bronchiectasis at the same time in pathology (black arrows)

## DISCUSSION

Carcinoid tumors are one of the Neuro Endocrine Tumors (NETs) that derive from embryonic neural crest and count for about 2% of the primary lung tumors (Oberg, 2002). Neuro Endocrine (NE) cells derived peptides have important paracrine regulatory and mitogenic function for bronchial epithelial cells. Exposure to pollutants, hypoxia and cigarette smoking induce hyperplasia of NE- cells in bronchial and cause mucosa secretion. Pulmonary NETs consist of a group of lesions with incidental from small proliferation of neuroendocrine cells to small cell lung carcinoma. Carcinoid tumors include neuroendocrine-cell hyperplasia lesions that rarely metastasize. Metastasis lesions often occur after lung resection. Tumorlets are frequently seen after acute lung injury in eosinophilic granuloma, tuberculosis, interstitial lung disease, cystic fibrosis, Cushing's syndrome, obliterative bronchiolitis and bronchiectasis. According to WHO classification of pulmonary neuroendocrine tumors of 1999, the spectrum of pulmonary NETs begins from NE cell hyperplasia, typical carcinoid, tumor lets, atypical carcinoid, small cell lung carcinoma and large cell neuroendocrine carcinoma (Leotlela et al., 2003). The majority of bronchial carcinoid are usually solitary masses, larger than 5 mm prehilal in location. The majority of bronchial carcinoids are usually solitary perihilar masses larger than 5 mm and patients often present with chest pain, cough, hemoptysis and recurrent pneumonia and have metastases reported in less than 10 percent of the cases (Leotlela et al., 2003). However, a small number of typical carcinoids may arise in the peripheral lung fields or adjacent to the pleura. Metastases sites are bronchopulmonary, hilar, and mediastinal lymph nodes. Atypical carcinoids occur in the sixth decade of life and occur more commonly in the peripheral lung fields and are larger than well differentiated NETs and metastasis to mediastinal lymph node sin 30 to 50 percent of cases. Chronic inflammation causes airway remodeling that may promote NE-cell hyperplasia. Miller and Muller (1995) reviewed 25 consecutive patients undergoing lung resection for peripheral carcinoid tumor and the results showed that nineteen patients had NE cells hyperplasia and eight patients had findings consistent with obliterative bronchiolitis. Charokopos et al. (2006) in Greece reported a case with multiple carcinoids tumors that were well defined but not encapsulated nodules with a size of 5 to 10 mm., located at the periphery of bronchioles and in the vicinity from the pleura. It shows carcinoid tumor association with bronchiectasis. In our case, bronchiectasis and small focus of neuroendocrine tumor was seen. This

finding suggests that carcinoids might be a hyperplastic response of NE-cells of bronchiectasis. Surgery is the choice of treatment for carcinoid tumor and requires total resection with safety margins and lymph nodes dissection. Finding bronchiectasis and carcinoid tumor simultaneously is a rare condition.

## CONCLUSION

Finding bronchiectasis and carcinoid tumor simultaneously is a rare condition, but in our case and Charokopos case report, findings show that it is prudent to consider the coexist of a carcinoid tumor and bronchiectasis at the same time, while other researches show carcinoid tumor as a complication of long standing bronchiectasis.

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### Competing interests

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

### Authors' contribution

MEH was the clinical supervisor and designed the study. FS and PN collected the data. FSK and YH made contribution between data and patient's document. The first draft of manuscript was prepared by FS and AS which was reviewed by the rest of authors. The revision was made by FS, PN and FSK under the supervision of MEH. The final version of the manuscript was read and accepted by all the authors.

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