Case Report

A case of bronchial/lung carcinoid cytological, histological and immunohistochemical corroboration

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ABSTRACT

Lung carcinoids tumors are uncommon tumors that start in the lung. They tend to grow slower than other types of lung cancers. Carcinoids tumors start from cells of the diffuse neuroendocrine system. It is widely recognized that cytology is superior to small biopsy in diagnosing small cell lung carcinoma since the crush artefacts limiting small biopsy interpretation is minimized in cytology. Similarly, carcinoids can be accurately diagnosed in cytology and small biopsy specimen. A correct preoperative cytological diagnosis helps in planning early and optimal surgery. We received the fine-needle aspiration cytology sample of bronchial mass of 46-year-old patient presenting with cough and hemoptysis for 2 months. Diagnosis of carcinoid tumor was given on cytology that was confirmed on histopathology and immunohistochemistry.

Key words: Carcinoid tumors, lung carcinoid, neuroendocrine tumor

INTRODUCTION

Neuroendocrine tumors (NETs) represent 25% of primary lung neoplasms, with the remaining 75% composed of nonsmall cell lung carcinoma (SCLC). The most common lung NET is SCLC (20%) followed by large cell neuroendocrine tumor (3%), carcinoid tumors (2%) and a typical carcinoid (TC) (0.2%).[1]

The 2004 World Health Organization classification recognizes four major types of lung NETs

- TC
- Atypical carcinoids (ACs)
- Large cell neuroendocrine carcinoma (LCNEC)
- SCLC.

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These tumors are further grouped in a 3-tiered grading system as low grade TC, intermediate grade AC, and high grade (LCNEC and SCLC) NET.[2]

Tumor is composed of organoid, palisading and trabecular arrangement of cells separated by fibrovascular stroma. TCs have fewer than 2 mitosis per 10 high power fields (HPF) and lack necrosis. ACs show increased pleomorphism, have more prominent nucleoli, 2 to 10 mitotic activities per 10 HPFs and foci of necrosis. On immunohistochemistry there is positive reactivity for serotonin, neuron specific enolase, chromogranin, and synaptophysin.

CASE REPORT

We received the fine-needle aspiration cytology (FNAC) sample of bronchial mass of 46-year-old patient presenting with cough and hemoptysis. FNAC revealed dispersed cell population of small neoplastic cells with rounded to oval nuclei with stippled nuclear chromatin, occasional small nucleoli, scanty cytoplasm and occasional adherence of cells to vascular core. In view of, presence of scant cytoplasm, absence of nuclear molding, mitotic figures, and necrosis and crush artefacts, small cell carcinoma was ruled out. Bronchiolo-alveolar carcinoma was ruled out because of absence of cohesion and presence of

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scant to a moderate cytoplasm. Hence, cytological diagnosis of carcinoid tumor was given Figure 1.

Histopathology; showed partially ulcerated respiratory epithelium. The sub epithelium showed a well circumscribed tumor. The tumor cells were arranged in an organoid pattern with formation of nests separated by thin vascular septae. The tumor cells having monomorphic round nucleus with stippled chromatin and a moderate amount of eosinophilic granular cytoplasm with <2/10 HPF mitotic figures there was the absence of necrosis Figure 2.

Tumor cells were positive for neuron specific enolase, chromogranin and synaptophysin Figures 3 and 4. Diagnosis of carcinoid was confirmed.

DISCUSSION

Carcinoid tumor comprises <2% of primary pulmonary neoplasms.it is divided into central, peripheral, and atypical. Central carcinoid is most common type. It usually presents as slow growing, polypoidal mass within a major bronchus. Most patients present with hemoptysis and pulmonary infection caused by blockage of distal bronchi.[3] Most cases occur in adults and sex incidence is almost equal. They are endocrinologicaly silent at the clinical level. However, cases with TC syndrome and elevated 5-hydroxyindoleacetic acid in the urine have been documented.[4]

In some cases tumor secrete 5-hydroxytryptatryptophan and adrenocorticotropic hormone.

Grossly central carcinoid tumors are predominantly intrabronchial but also infiltrate the bronchial wall, may extend to the surrounding parenchyma, and may even reach the pleura or the myocardium. The morphological and immunohistochemical features of bronchial carcinoid tumor resemble those of the carcinoid tumors of thymus and larynx rather than those of gastrointestinal carcinoid

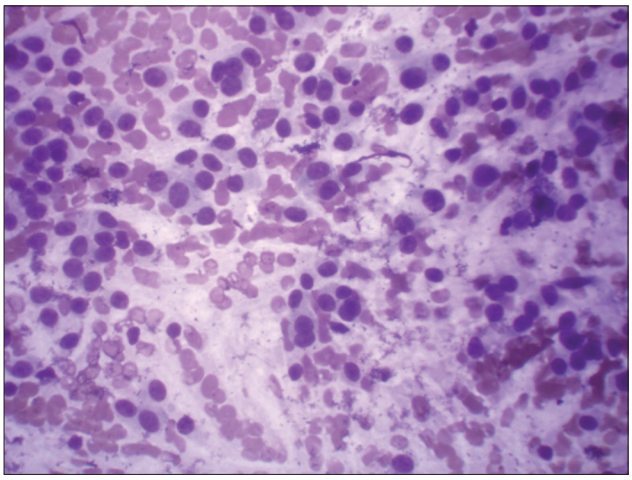

Figure 1: Photomicrograph shows dispersed cell population of round cells with stippled chromatin inconspicuous nucleoli and a moderate cytoplasm. Giemsa stain (×400)

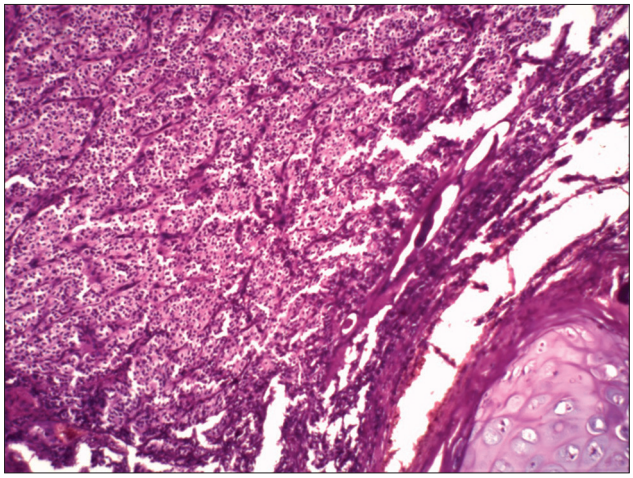

Figure 2: Photomicrograph showing tumor nests separated by highly vascularized stroma. H and E, ×400

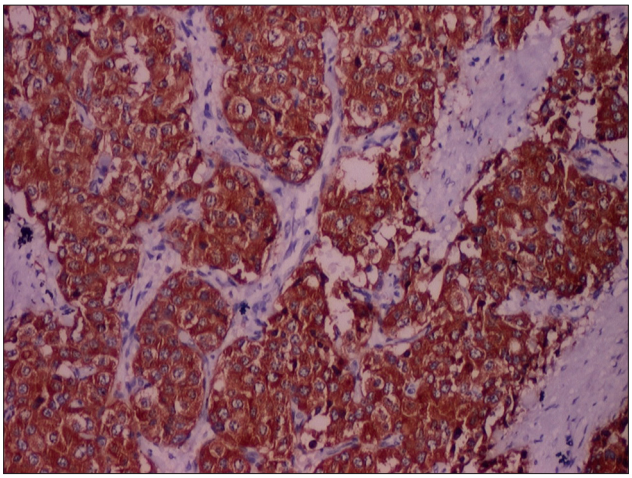

Figure 3: Photomicrograph showing cytoplasmic immunoreactivity for synaptophysin

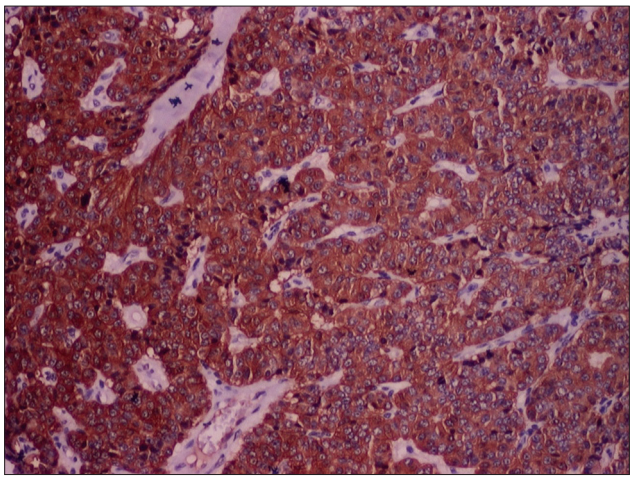

Figure 4: Photomicrograph of immunohistochemical staining showing tumor positivity to chromogranin

tumors[5] by electron microscopy, the cells contain numerous dense-core secretary granules varying in size and shape. Immunohistochemically, there is a variable positivity for keratin, serotonin, neuron specific enolase, chromogranin A and B, secretoneurin, opioid peptides and neurofilaments.[6]

Carcinoid tumors with prominent nesting pattern of growth may acquire a paraganglioid appearance, which is accentuated by the presence of S-100 protein–positive sustantacular cells at the periphery of the nest.[7]

Flow cytometry studies have shown that aneuploidy is more common in the TC than in central carcinoids. Cytogenetically TC tumors are characterized by 11q deletions.[8] Metastases to regional lymph nodes occur in about 5% of the cases; rare instances of distant metastases have also been documented.[9]

This case highlights the usefulness of FNAC in correct diagnosis of the carcinoid tumor, as indolent clinical behavior can be explained to the patient after cytological examination. FNAC provided earliest clue to the diagnosis of carcinoid tumor that was later confirmed by histopathology and immunohistochemistry.

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