

Case Report

Bronchoalveolar Carcinoma-the great masquerader: A Case Report.

Anupama Tandon*, Rajesh Tandon, Satish K. Bhargava*, Nevin Kishore*****

*Department of Radiodiagnosis and Imaging, University College of Medical Sciences and GTB Hospital, Dilshad Garden, Delhi, India

Department of Pathology & *Pulmonary Medicine, Max Superspeciality Hospital, Saket, New Delhi, India

Abstract: Bronchoalveolar carcinoma has always been a diagnostic challenge for both physicians and radiologists alike. Its varied presentations mimic other common pathologies and the diagnosis is delayed more often than not. A case of a 33 year old female patient with multiple small well-defined nodules in both lung fields, diagnosed as mucinous type of diffuse bronchoalveolar carcinoma on lung biopsy, is being presented.

INTRODUCTION

Lung cancer has been a leading cause of mortality and morbidity in developed countries and is now rising at an alarming rate in India as well. Also, there is a changing trend with higher incidence being noticed at younger age and in females. Currently lung cancer accounts for as high as 7.4% of total cancer incidence in India and 20% of cancer related deaths in females¹. Bronchoalveolar carcinoma accounts for only 1.5-6.5% of all primary lung cancer and its prevalence is higher in younger patients, non-smokers and women². Bronchoalveolar carcinoma has been grouped into two types: the localized "focal" form and the "diffuse" form. The "focal" form is often incidentally detected as a peripheral pulmonary nodule on chest radiograph/ CT scan done for unrelated reasons. This nodular form is indistinguishable from nodules of many other benign and malignant diseases. The "diffuse" form is a great masquerader and can appear radiologically as air space consolidations masquerading pneumonia, as multiple nodules mimicking disseminated tuberculosis, fungal infection, metastasis etc or as ill-defined masses, cavitating nodules or pleural effusions. The varied and non-specific clinical and radiological features, more so in diffuse type, often delay the diagnosis of this potentially aggressive form of lung cancer.

CASE REPORT

A 33year old female patient presented to the chest clinic with complaints of cough with thin whitish sputum, dysnoea and weight loss for past 6 months. She was a housewife, nonsmoker and had no history of diabetes or any chronic illness. No history of exposure to industrial dust or any chemical. General physical examination was essentially normal except for mild pallor. Chest examination revealed bilateral diffuse crepitations on auscultation. CVS and abdominal examinations were unremarkable. All laboratory investigations were normal except hemoglobin level of 9gm%. HIV status was negative. Chest radiograph revealed multiple discrete small nodules with well defined margins in bilateral mid and lower zones. A band shaped area of homogenous opacification limited inferiorly by horizontal fissure was seen in right mid-zone. No evidence of pleural effusion or adenopathy seen. Cardiac silhouette and mediastinum were normal. (Fig 1).

CECT chest with HRCT sections was performed which showed innumerable small well defined 3-5mm nodules of uniform size scattered randomly in both lung fields. No specific distribution pattern was seen except higher density in lower lobes. Most nodules demonstrated a central "bubble like" hypodensity (Fig 2). In addition,

peribronchial thickening/ cuffing was seen along central bronchi. A wedge shaped homogenous opacity with air-bronchograms was seen in anterior segment of right upper lobe suggestive of consolidation. Mild pleural thickening was also seen on right side. Few small sub-centimeter lymph nodes were present in pretracheal location, rest of the mediastinum and heart was normal.

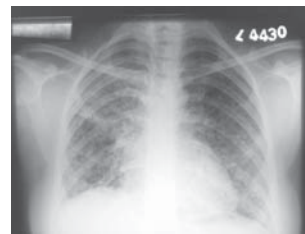


Fig 1: Chest Radiograph shows multiple nodules in bilateral mid and lower zones with consolidation in right upper lobe.

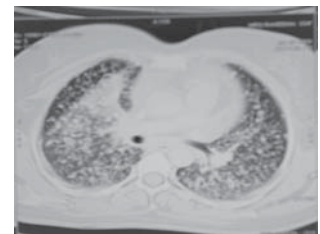


Fig 2: HRCT demonstrates multiple small interstitial nodules with central hypodensity and a wedge shaped consolidation in right upper lobe.

On the basis of these radiological features multiple differentials were considered like disseminated tuberculosis, sarcoidosis, granulomatous disease, silicosis, pneumoconiosis, metastasis, disseminated fungal infection, lymphoma, and bronchoalveolar carcinoma. A lung biopsy was advised.

Bronchoscopy with bronchoalveolar lavage (BAL) and lung biopsy was done next. Bronchoscopy was normal. BAL cytology revealed few individually dispersed cells with slightly increased N/C ratio, hyperchromatic nuclei and vacuolated cytoplasm. It was suspicious for low grade malignancy. Lung biopsy microscopy revealed terminal air spaces lined by well differentiated mucin containing columnar cells with preservation of lung architecture and absence of stromal invasion. The tumor cells showed moderate nuclear atypia and prominent nucleoli with a sharp demarcation between the atypical and normal cells (fig 3).

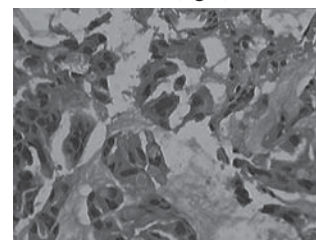


Fig 3: Photomicrograph of bronchoalveolar carcinoma demonstrates alveolar spaces filled with mucous and hyperchromatic tumor cells.

Correspondence: Dr. Anupama Tandon, 119-B, pocket-C, Siddhartha Extension, New Delhi-110014, India
E-mail: zulutandon@sify.com M: 9899991548

A diagnosis of mucinous type of bronchoalveolar carcinoma was made.

Patient was explained the prognosis and advised chemotherapy which she refused and left hospital against medical advise.

DISCUSSION

Lung cancer has long been the most common malignancy among men especially smokers, with squamous cell carcinoma being the commonest type. In recent years there has been a rise in its incidence of adenocarcinoma and small cell carcinoma³. Also noticeable is a rise among non-smokers, females and young patients⁴.

Bronchoalveolar carcinoma accounts for only 1.5-6.5% of all primary lung carcinoma and is a subtype of adenocarcinoma. Its prevalence is higher in women (30-50%) and in nonsmokers (only 25-50% patients are heavy smokers)². BAC is a peripheral neoplasm arising beyond a recognizable bronchus from bronchiolar epithelium and has a tendency to spread centrally through the airway and lymphatics without evidence of stromal, vascular or pleural invasion. The key feature is preservation of underlying lung structure. The risk factors include localized pulmonary fibrosis (post tubercular, infarction etc), diffuse fibrotic disease (scleroderma etc) and pre-existing exogenous lipid pneumonia².

For descriptive, therapeutic and prognostic purposes the different presentations are grouped under "localized" and "diffuse" forms.

The localized form is usually asymptomatic and appears as a solitary well circumscribed slow growing peripheral nodule with or without spiculations. A unique feature is presence of air-bronchograms within the nodule and associated ground glass attenuation. Other signs include central hypodensity/ pseudocavitation caused by patent small airway within the lesion, open bronchus sign caused by patent bronchus surrounded by alveoli filled by tumor and mucous, pleural tags due to fibrous strands extending upto pleura and corona radiata due to associated desmoplastic reaction². This form is usually slow growing and has a good prognosis. Radiologically it is difficult to distinguish from benign lung tumor, granuloma, typical adenocarcinoma, lymphoma, round pneumonia and Kaposi's sarcoma.

The diffuse form has a spectrum of clinical and radiological features. Most cases are asymptomatic till a late stage when cough, dysnoea, weight loss are common symptoms. Bronchorrhoea (passage of thin mucoid sputum) is a specific feature but is rarely seen (5%), that too in later stages of mucinous carcinoma.

Radiologically the diffuse form can appear as a (1.) Multiple non-calcified nodular lesions; (2.) Lobar / segmental consolidation/s; (3.) Ill-defined mass; (4.) Poorly defined densities with ground glass attenuation

Pleural effusion occurs in only 8-10% cases, mediastinal nodes being less frequently seen. Other manifestations include atelectasis, pneumothorax, cavitation of nodule/ infiltrate and extrapulmonary metastasis.

The consolidations seen with BAC can be mistaken for pneumonia, aspiration, pulmonary edema, lymphoma or infarction.

The multinodular form accounts for less than 25% of all cases of bronchoalveolar carcinoma. On chest radiographs multiple well circumscribed soft tissue non calcified nodules are seen scattered diffusely in both lung fields. Associated consolidations, ground glassing or pleural effusions may be seen. On CT scan multiple well circumscribed uniform sized nodules are seen in both lungs. They show a random distribution. Central hypodensity is usually seen in most nodules-the so called "bubble sign" or "pseudocavitation" and is on account of patent airways within the lesion (seen in most nodules

in our case)⁵.

Radiological differentials for the multinodular diffuse form are disseminated tuberculosis, metastasis, fungal infection, granulomatous disease, lymphoma, silicosis, sarcoidosis, pneumoconiosis and vasculitis.

In silicosis/ pneumoconiosis nodules are typically centrilobular/subpleural and are distributed mainly in posterior upper lobes with mediastinal nodes often showing typical egg-shell calcification. The absence of this pattern and exposure history excludes these conditions. Sarcoidosis has a typical peribronchovascular and paraseptal and upper lobe distribution of nodules with associated mediastinal and hilar adenopathy which again was absent in our case.

High grade pulmonary lymphoma may have a multinodular pattern but is usually associated with lymphadenopathy.

Nodular metastasis can mimic this pattern, however often nodules are of varying sizes representing multiple episodes of tumor embolization or different growth rates.

Disseminated fungal infection, diffuse granulomatous disease & disseminated tuberculosis cannot be reliably differentiated from bronchoalveolar carcinoma on imaging. The bubble sign/ pseudocavitation is useful sign but even this can occur in some other conditions like lymphoma and fungal infections.

In our case the diagnosis was made on biopsy, however retrospectively we found that presence of bubble sign and a history of thin mucoid sputum were strong pointers towards the diagnosis.

Microscopically BAC can be divided into mucinous and non-mucinous subtypes. Mucinous subtypes formed by well to moderate differentiated mucous containing columnar cells and is more likely to be multicentric than the non-mucinous form.

The non-mucinous subtype originates from clara cells and/or type II pneumocytes and grow along alveolar wall as single layer of cuboidal to columnar cells in a lipidic fashion. Nuclear atypia and nucleolar prominence is greater than in mucinous variety and apical snouts may be present as indication of clara cell differentiation. Septal widening and sclerosis is more common in this subtype and when it is extensive, the tumor is referred to as a sclerosing variant⁵. Alpha-1 antitrypsin is a useful marker for clara cell differentiation and surfactant apoprotein is a surfactant marker for type-II pneumocytes. Sputum or bronchial washing cytology is almost invariably negative in cases that present as solitary nodule but is positive in up to 88% of cases of multinodular and pneumonic forms.

The focal form has a good prognosis after resection. The diffuse form requires systemic chemotherapy and generally carries a poor prognosis.

CONCLUSION

Bronchoalveolar carcinoma has diverse clinical and radiological manifestations and often masquerades more common diseases. Thus, it is essential to have a high index of suspicion along with a thorough knowledge of its varied presentations to reach to a timely and accurate diagnosis.

REFERENCES

1. Menon B, Kulshrestha R, Aggarwal B, Sharma S, Jain P. A Rare Case of Non-Small Cell Carcinoma in an 18-year-old female. *Indian J Chest Dis Allied Sci* 2007;49:103-105.
2. Lee KS, Kim Y, Han J, Ko EJ, Park C, Primack SL. Bronchioalveolar Carcinoma: Clinical, Histopathologic, and Radiologic Findings. *Radiographics* 1997;17:1345-1357.
3. Chhajed PN, Athavale AU, Shah AC. Clinical and pathological profile in patients with lung carcinoma: Is the picture changing? *JAPI* 1999; 47: 483-487.
4. Shetty CM, Lakhkar BN, Gangadhar VSS, Ramachandran NR. Changing pattern of bronchogenic carcinoma: A statistical variation or reality? *Chest* 2005; 15(2):233-238.
5. Trigaux JP, Gevenois PA, Goncette L, Gonat F, Schumaker A et al. Bronchioalveolar Carcinoma: Computed Tomography findings. *Eur Respir J* 1996; 9: 11-16.