Case Report

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Bronchioloalveolar Carcinoma Mimicking as Pneumonia: A Case Report

Internal Medicine Section

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ABSTRACT

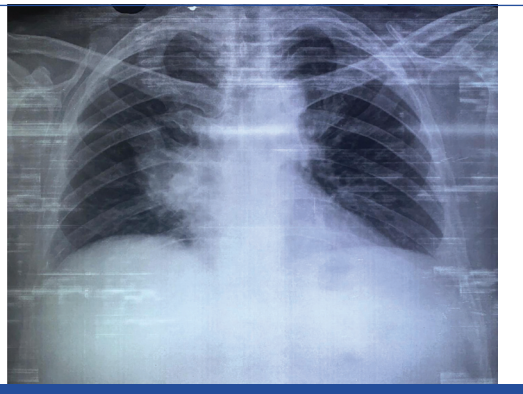
Bronchioloalveolar Carcinoma (BAC) also known as alveolar cell carcinoma is a subtype of adenocarcinoma that is more common in women and non smokers. It accounts for almost 5% of all lung cancers. Bronchioloalveolar carcinoma may appear as a wide variety ranging from solitary nodule to patchy, lobar or multilobar opacities. The mucinous, non mucinous, ambiguous or mixed are the histological types of BAC. The mucinous variety of BAC sometimes may present as a consolidation which is indistinguishable from an infective pneumonia on a radiological picture. Hereby, authors present a case of 65-year-old male patient, who was evaluated for non resolving pneumonia for a time span of one year. He presented to the Respiratory Medicine Outpatient Department with a cough and expectoration for the past nine months. Antibiotic courses did not provide the patient any sort of relief and there was no change in the size of the lesion. Chest X-ray has shown right sided non homogenous opacity and later Contrast Enhanced Computerised Tomography (CECT) thorax and biopsy (Computed Tomography-guided {CT-guided}) was done from the same site for further evaluation. Cytology done from CT-guided biopsy sample showed typical lepidic growth pattern. Histopathologically, it showed mucinous variety of BAC. Usually, the patients have no symptoms, but an abnormal chest X-ray, while a few have features like coughing with expectoration and pain in the chest. Only cytology or biopsy can help with a proper diagnosis, which can be done via needle biopsy (CT or fluoroscopy-guided) or transbronchial biopsy and Bronchioloalveolar Lavage (BAL). It has rarely been documented in the literature that BAC masquerades as a consolidation with very little change.

Keywords: Adenocarcinoma, Consolidation, Mucinous variety

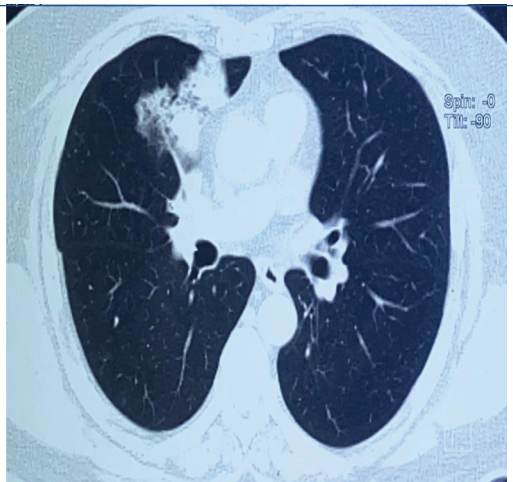
CASE REPORT

A 65-year-old male, an accountant by profession and a non smoker, presented to the Respiratory Medicine Outpatient Department with a cough and expectoration for the past nine months. Sputum was 4-5 cc/day, whitish, mucoid, non foul-smelling, non blood tinged. He had no history of chest pain, breathlessness, fever, chills, rigours, haemoptysis, hoarseness of voice, loss of weight, or loss of appetite. The patient had type 2 diabetes mellitus and was taking his medicine on a regular basis. He had no other major illnesses. On general examination, he was conscious, coherent and well-oriented to time, place and person. Icterus, cyanosis, clubbing, oedema, and lymphadenopathy were not present. He was afebrile, with a pulse of 96 beats per minute, a respiratory rate of 20, a blood pressure of 122/80 mmHg, and a SpO_2 of 98% on room air. Breath sounds were reduced throughout the right interscapular area during a respiratory system assessment.

Routine microbiological investigations were within normal limits. Sputum for Acid Fast Bacilli (AFB) was mucoid negative. Chest X-ray showed right-sided non homogenous opacity [Table/Fig-1] and later Contrast Enhanced Computerised Tomography (CECT) thorax was done, which showed an ill-defined patch of consolidation with surrounding Ground Glass Opacities (GGO) with interlobular septal thickening in the anterior segment of the right upper lobe of size 6.7×4.1×5.2 cm, with postcontrast enhancement [Table/Fig-2]. The provisional diagnosis at this stage was a non resolving consolidation, probably BAC and also we had the differential diagnosis of inflammatory processes like bronchiolitis obliterans or hypersensitivity pnuemonitis as the radiological features are similar and along with it, the presenting features (cough, chest pain, and sputum production) are pretty much similar to other inflammatory processes.



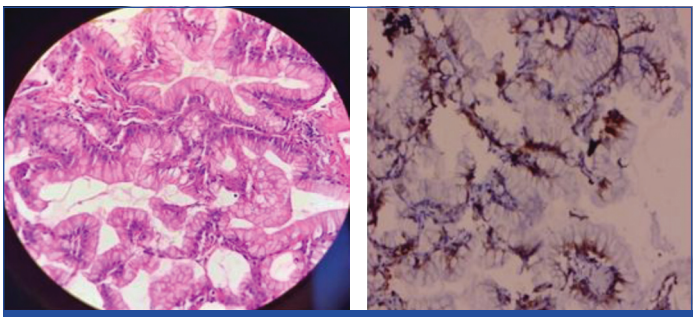
[Table/Fig-1]: Chest X-ray showing non homogenous opacity.



[Table/Fig-2]: Contrast Enhanced Computerised Tomography (CECT) thorax showing ill-defined consolidation.

For further evaluation, A CT-guided biopsy was done from the anterior segment of right upper lobe. Cytology done from CT guided biopsy sample showed the cells arranged in sheets and a honeycomb-pattern with a typical lepidic pattern with cells having hyperchromatic nuclei, vacuolated to clear abundant cytoplasm suggestive of mucinous bronchioloalveolar adenocarcinoma. Histopathology report showed columnar cells containing mucin lining the respiratory spaces in lepidic fusion without invading

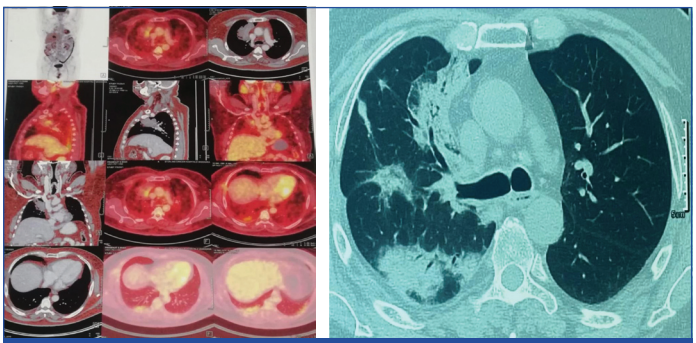
stroma suggesting bronchioloalveolar carcinoma [Table/Fig-3]. Immunohistochemistry (IHC) has shown tissue infiltration by a tumour composed of complex back-to-back glands lined by mucin-secreting columnar cells displaying mild nuclear anaplasia. Lymphovascular and perinuclear invasions are not seen. Tumour cells are diffuse and strongly positive for CK7, TTF1, and Napsin A and negative for CK20, suggesting primary well differentiated mucinous adenocarcinoma of the lung [Table/Fig-4]. A cancer targeted gene panel showed a mutation to the KRAS gene. By this, the final diagnosis of the present case was Bronchioloalveolar Carcinoma (BAC).



[Table/Fig-3]: Histopathology image showing lepidic growth pattern (H&E stain, 400X).
[Table/Fig-4]: Immunohistochemistry image showing positivity. (Images from left to right)

To identify the metastasis of the tumour, Positron Emission Tomography and Computed Tomography (PET-CT) scan was done [Table/Fig-5], which revealed an area of consolidation and interlobular septal thickening with enhancement and mild Flourodeoxy Glucose (FDG) activity in the anterior segment of the RUL-likely primary. FDG avid GGO in bilateral lungs predominantly peripheral.

A repeat CT scan was done after three months period. As compared to the previous CT scan, patchy areas of consolidation in the right upper lobe, right middle lobe, and superior segment of the right lower lobe of the lung had newly appeared [Table/Fig-6]. The patient is now undergoing combined treatment chemotherapy with cisplatin (90 mg) and premetrexed (800 mg) in cycles and radiotherapy.



[Table/Fig-5]: Positron Emission Tomography and Computed Tomography (PET-CT) scan showing mild-Flourodeoxy Glucose activity in the right upper lobe.
[Table/Fig-6]: CECT-thorax showing consolidation in right upper lobe, middle lobe and lower lobe. (Images from left to right)

DISCUSSION

The BAC can be defined as neoplasm which is not of central origin, but is peripherally located; therefore the term “bronchiolo” but not “bronchioloalveolar” carcinoma. It grows along alveolar septa and the lung parenchyma remains intact. BAC, as described earlier, is divided into non mucinous, mucinous, and mixed subtypes, with the non mucinous variety being more common, consisting of hobnail (cuboidal) cells with apical nuclei, while the present case is mucinous type of BAC, consisting of tall columnar cells with abundant pale cytoplasm with basal nuclei resembling goblet cells [1]. These tumours are a diverse group of peripheral lung tumours, that can develop from any epithelial cell within or distal to terminal bronchioles [2]. The pattern of growth is lepidic, meaning the proliferation of tumour cells lining the alveolar walls occurs in a uniform manner, using them as a scaffold with no stromal or vascular invasion. BAC is now being termed as adenocarcinoma in-situ [3]. It differs clinically from other types of non small cell lung cancer in certain features. These include a female predominance, particularly in East Asians; no or little smoking history; a slow course. In the present case report, patient is an old aged male, non smoker, presented with the complaints of cough with expectoration, since nine months with no other symptoms. Cough, chest pain, breathlessness, loss of appetite, loss of weight, haemoptysis being the most common presenting symptoms, very rarely patients can present with sudden haemoptysis requiring intubation [4]. Bronchorrhoea is unusual and a late manifestation seen only with diffuses BAC [5]. Very rarely BAC may present as recurrent pneumonias associated with asymptomatic peripheral eosinophilia [6].

If a patient who ordinarily has pneumonia does not have a fever, leucocytosis, or responds to medications, the physician should be suspicious about BAC [7]. In the current case, the patient showed a consolidation with surrounding GGO with interlobular septal thickening in the right upper lobe, which led to the suspicion of pneumonia mimicking malignancies. BAC has distinct chest computed tomographic findings, sometimes small, peripheral nodules and, less frequently, as pneumonic-type consolidation or diffuse, inoperable lesions. Solid or partly solid attenuation, the presence of air-containing gaps, and the lack of contractive changes are other radiographic markers of localised mucinous BACs [8]. Bronchoscopic examination is normal, but sometimes presents as a neoplastic mass within the lumen if a tumour is present centrally, brochial stenosis or compression from outside due to lymph node metastasis. Sometimes, the patients undergo an inconclusive bronchoscopy and receive several courses of antibiotics including anti-tubercular therapy without relief [9].

After confirmation of diagnosis, patient was started on chemotherapy with cisplatin and premetrexed along with radiotherapy with 60 Gy (2Gy/fraction) in cycles. Prognosis depends on size of scar, size of invasive component and pattern of invasion as the patients with small, peripheral BAC have very good prognosis [10]. BAC patients have a considerably higher one year survival rate, than those with other histological subtypes of Non Small Cell Lung Cancer (NSCLC) [11]. In a study by Yotsukura M et al., no reoccurrence of either of these cancers was observed in a group of 542 people after surgical removal. The estimated disease-specific survival rates were 100 percent [12]. Lobectomy is the preferred treatment for pneumonic consolidation. When there is multifocal involvement, segmentectomy or wedge resection may be performed. If positive for PDL-1 receptor, immunotherapy with nivolumab or pemrolizumab can be given. Rapid responses have been observed, when specific mutations in the epidermal growth factor receptor are present [13]. In the event of a recurrence, lung transplantation may be useful.

CONCLUSION(S)

Bronchioloalveolar carcinoma, due to its resemblance with pneumonia the diagnosis and treatment are often delayed. In the current scenario, the patient had a presentation similar to pneumonia which was not responding to antibiotics. In order to diagnose the condition, CT-guided biopsy was done which showed mucinous type of BAC which led to the early initiation of treatment. Bronchoscopic examination might be normal in most of the cases and the use of Positron Emission Tomography (PET) is ineffective in determining the difference between inflammatory and infective aetiology. Hence, biopsy must always be considered when an pneumonia-like picture does not respond to antibiotic medication.

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