CASE REPORT

Mucinous carcinoma (colloid carcinoma) of the lung diagnosed by fine needle aspiration cytology: a case report

Gita JAYARAM, MIAC, FRCPath, Roshidah YACCOB and Chong Kin LIAM, FRCP, FCCP*

Departments of Pathology and *Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur

Abstract

Mucinous carcinoma of the lung, also known as colloid carcinoma, is an uncommon tumour that is rarely encountered in fine needle aspiration (FNA) cytological practice. A 64-year-old Chinese male presenting with blood stained sputum and hoarseness of voice was discovered to have a 3 cm sized mass in the left lung. Neither bronchial washings nor transthoracic FNA yielded positive results at this stage. Six months later the patient returned to the hospital with a larger tumour and mediastinal lymphadenopathy. Transbronchial lymph node FNA, reported as negative for malignancy showed normal, hyperplastic and mildly atypical bronchial epithelial cells as well as a few single cells and extracellular mucin. Transthoracic FNA of the lung lesion performed under computed tomographic guidance showed characteristic cytological features of this tumour, establishing the diagnosis.

Key words: Mucinous carcinoma, colloid carcinoma, lung, neoplasm, fine needle aspiration cytology

INTRODUCTION

Mucinous carcinoma (MC) is an uncommon tumour in the lung.1 Cytological diagnosis of this entity, particularly on small specimens, is extremely difficult because of the paucity of tumour cells relative to the amount of mucin present.2 This report documents fine needle aspiration (FNA) cytological diagnosis of MC of lung in a 64-year-old man.

CASE REPORT

A 64-year-old Chinese man presented to the chest clinic of the University Malaya Medical Centre in May 2001 with an one-month history of hoarseness of voice and blood stained sputum. He was a non-smoker and had not experienced any weight loss or anorexia. There was no remarkable positive finding on physical examination. His chest radiograph showed a 3 cm diameter mass lesion in the left lung adjacent to the left heart border. Computed tomography (CT) scan of thorax showed a 3 cm mass in the inferior segment of the lingular lobe and a 2 cm sized lymph node in the aortopulmonary window. Bronchoscopy revealed a paralyzed left vocal cord with no evidence of any endobronchial tumour. Cytological study of bronchial washings was negative for malignancy. Two attempts at CT-guided transthoracic FNA (TTFNA) by the radiologist yielded scanty material. The patient’s serum carcinoembryonic antigen levels done on two occasions at an interval of one week were 31.5 ng/mL and 29.1 ng/mL respectively (normal = 0-2.5 ng/mL). The patient defaulted follow-up and re-presented in December 2001 with persistent hoarseness but no other symptoms. A repeat thoracic CT showed doubling of the size of the lingular mass as well as enlarged lymph nodes in the precarinal region and the aortopulmonary window. Transbronchial FNA (TBFNA) of the enlarged precarinal lymph node was reported as showing atypia but no definite evidence of malignancy. CT-guided TTFNA of the lung mass done by the cytopathologist (GJ) yielded a cytological diagnosis of MC of lung. Review of the TBFNA smears showed cytological features of mucinous carcinoma that were initially considered as reactive or hyperplastic changes in the bronchial mucosa. At this juncture the tumour was staged as IIIB T4N2M0 and the patient opted for conservative management. Detailed clinical work-up at this time (and regular checks during the 30 months follow-up period, during which time the patient experienced some weight loss and occasional episodes of hemoptysis) showed no evidence to suggest a lung metastasis from a primary in the gastro-intestinal tract or elsewhere.
Cytological features
Smears prepared from the initial needle passes of the TBFNA stained with May Grünwald Giemsa (MGG) showed numerous benign bronchial epithelial cells with their terminal plates and cilia intact. These cells were single, in clusters, palisades and strips with goblet cells intermingled. Smears prepared from the last needle pass showed many scattered lymphoid cells and pools of mucin within which were floating fragments of epithelium (Fig 1). In well-spread areas of the smears, clusters and palisades of bronchial epithelial cells showing focal nuclear enlargement and mild pleomorphism (Figs. 2 & 3) merged imperceptibly with normal-appearing and hyperplastic bronchial epithelium. Dissociated bronchial epithelial cells with eccentric nuclei and mild nuclear atypia (Figs. 2 & 3) were also present.

MGG-stained TTFNA smears showed clusters and sheets of small bland epithelial cells floating in pools of extracellular mucin (Figs. 4 & 5). In Papanicolaou-stained smears mild to moderate nuclear pleomorphism (Fig. 6) was visible and occasional cells showed macronucleoli. A few cells showed cytoplasmic mucin and signet ring forms were present (Fig. 6). Review of the bronchial washings obtained during the first bronchoscopy showed no evidence of malignancy and the earlier TTFNA smears of the lung lesion showed mainly blood with no tumour cells.

DISCUSSION
On the basis of growth pattern, the WHO classifies peripheral lung adenocarcinoma into four types (papillary, tubuloacinar, bronchioalveolar and solid carcinoma with mucous production). Based on ultrastructural morphology, five subtypes of peripheral lung adenocarcinoma are known: Clara cell-type, bronchial surface epithelial cell type, bronchial gland cell type, goblet cell type and type 2 pneumocyte type. Of these, the goblet cell type that shows a bronchioalveolar growth pattern and the bronchial gland cell type often produce mucin and are described as “mucous producing adenocarcinomas”. The term “mucinous carcinoma” or “colloid carcinoma” referring to a tumour producing vast amounts of extracellular mucin pools is a more recently described variant of bronchial adenocarcinoma. This type of carcinoma is well known to occur in the breast and the gastro-intestinal tract (GIT), but is extremely rare in the lung. The typical growth

FIG. 1: Clusters of small cells in pools of extracellular mucin in TBFNA smear. MGG x 200
FIG. 2: TBFNA smear showing normal respiratory cells admixed with cells showing mild atypia (arrows). MGG x 200

FIG. 3: TBFNA smear showing benign appearing respiratory cells and enlarged single cells with mild nuclear atypia and eccentric nuclei (arrows). MGG x 400
FIG. 4: TTFNA smear showing clumps of epithelial cells floating in pools of mucin. MGG x 80

FIG. 5: TTFNA smear showing clusters of small cells floating in a mucin pool. MGG x 200
The pattern of MC of lung is characterized by the accumulation of abundant extra-cellular pools of mucin destroying the normal lung parenchyma. In the past, tumours with identical features were diagnosed under several designations, including mucinous cystadenoma, mucinous cystadenocarcinoma and mucinous cystic tumours of borderline malignancy. Because of their demonstrated capability for distant metastases and aggressive behavior, it is preferable to designate them collectively under the term MC.

The relatively bland features of the tumour cells coupled with the paucity of cells in MC have reported to have been the cause of false negative diagnoses even in breast FNA where the cytology of MC is well documented and described. In the present case, the TBFNA smears on initial screening were considered to show some atypical features such as single cells with mild nuclear atypia and occasional signet ring forms but a confident cytomorphological diagnosis of malignancy was not given. On review these features were considered to be compatible with a cytomorphological diagnosis of MC. The presence of numerous benign respiratory cells and the apparent transition from normal-appearing to hyperplastic to mildly atypical forms was largely responsible for the misconception of the cytomorphological picture as reactive. The benign respiratory cells seen in the TBFNA smears were in all probability from the bronchial lining epithelium. These cells (and also goblet cells) are often seen in TBFNA samples of peribronchial lymph nodes. Whereas in a breast FNA, clumps of cells floating in extracellular mucin would raise a suspicion of MC, this feature was not considered significant in the TBFNA sample as mucin from the bronchial lumen is not uncommonly present here. The other factor responsible for the false negative diagnosis here was that the rarity of this tumour in the lung did not bring about a differential diagnostic consideration of MC.

A diagnosis of MC from the TTFNA of the lung mass was in contrast relatively easier as it was similar to FNA cytomorphological features described in MC of breast. Moreover, no contaminating cells were expected to be present in this sample. In conclusion we emphasize that MC of the lung, albeit a rare tumour, must be suspected when cytological smears show mucin pools and single cells with mild atypia or signet-ring forms. Cytological features of MC have been well described and documented; hence histological confirmation, although desirable,
was not deemed essential in the present case. The authors however wish to stress that a diagnosis of MC of lung is one of exclusion and should not be made unless a primary lesion in the breast or GIT, (where these tumours are more common), has been excluded on the basis of clinical and radiological features. We believe that this is the second documented case of FNA cytological diagnosis of MC of lung.

REFERENCES