대한병리학회지 : 제23권 제 3 호 1989
Kor. J. Path., Vol. 23(3):355 - 358

Fine Needle Aspiration Cytology of Pulmonary Hamartoma

— 3 cases —

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— Abstract —

Fine needle aspiration cytology of three cases of pulmonary hamartoma is presented. Case 1 was in a 67-year-old man with a 7 cm-sized left lung mass. Case 2 and 3 were in 47 and 53 year old females and consisted of 3 cm and 2 cm-sized right lung nodules, respectively. Fine needle aspiration of the masses revealed several fragments of irregularly shaped mature hyaline cartilage or fibromyxoid mesenchyme and sheets of benign epithelial cells in scanty to acellular background. Also scattered were inflammatory cells including lymphocytes, neutrophils and histiocytes and mature fat cells. These features were diagnostic for pulmonary hamartoma and case 1 was histologically confirmed by following surgical excision of the mass. Differential diagnoses about pulmonary hamartoma in the respect of conditions capable of producing cartilage on fine needle aspiration, were discussed.

Key Words: Pulmonary hamartoma, Fine needle aspiration cytology

INTRODUCTION

Pulmonary hamartomas are uncommon lung tumors, accounting for approximately 4% of solitary pulmonary nodules[1]. They are nodular malformations, now considered to be benign neoplasms and affect men more frequently than women[3~5]. Recently, fine needle aspiration cytology is accepted as a rapid, safe, and highly accurate diagnostic tool in approaching the patients with a solitary lung nodule but there are few reports about cytologic findings of pulmonary hamartoma. This may be partly due to the difficulty in obtaining diagnostic material from such cartilaginous lesion and partly due to the lack of awareness of the mesenchtmal components in smear preparations[1,2].

This communication presents cytologic features of three cases of pulmonary hamartoma diagnosed by percutaneous fine needle aspiration.

MATERIALS AND METHODS

In all cases, fine needle aspiration of the lung nodules was performed under the fluoroscopic guidance using a 21-gauge Chiba biopsy needle. Smears prepared from aspirated material were immediately fixed in 95% ethanol and stained by the Papanicolaou method. Their clinical data were reviewed and summarized in Table 1.

RESULTS

The smear of case 1 showed abundant mesen-

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**본 논문의 요지는 1989년 5월 11일 대한세포병리학회 제 4 차 춘계학술대회에서 발표 되었음.

Table 1. Clinical data of 3 cases of pulmonary hamartoma

Case No.	Age	Sex	Location	Diameter (cm)	Chief complaint
1	67	M	Left lower lnug	7	Asymptomatic
2	47	F	Right upper lung	3	Chest discomfort for 10 days
3	53	F	Right lower lung	2	Cough and sputum for 1 month

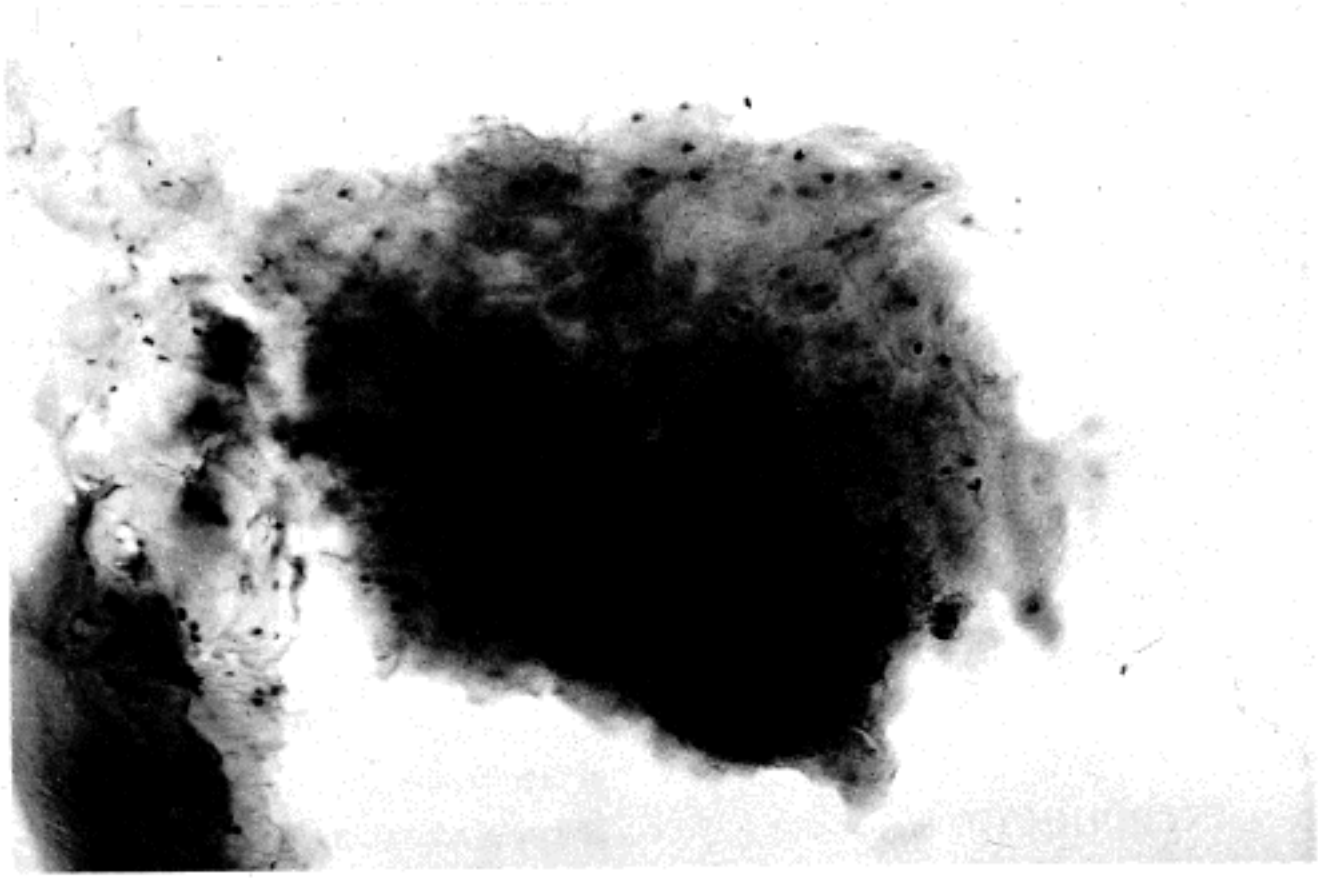

Fig. 1. Lung aspirate contains a fragment of mature hyaline cartilage (Papanicolaou, x20).

chymal components consisting of pale blue to purple mature cartilage, chondroid mesenchyme and fibromyxoid stroma, which were usually irregularly shaped and contained yellow to orange lacunar cells embedded in the cartilage or chondroid mesenchyme (Fig. 1). In the clean background, nonciliated and cuboidal epithelial cells of isolated or grouped pattern were also observed (Fig. 2). They were generally uniform in size and had oval to round nuclei. The nuclei had finely granular chromatin and smooth, uniform and thin membrane. Nucleoli were not prominent in most cells. The cytoplasm was usually scanty to moderate. Additionally, lymphocytes, neutrophils, and histiocytes were infrequently scattered and sometimes mature fat cells were found. The patient underwent an excision of the mass which histologically consisted of islands of mature hyaline cartilage and intervening bronchial epithelium-lined spaces, fat cells and smooth muscle (Fig. 3).

Cytologic findings of case 2 and 3 were largely similar to those of case 1, but showed componential differences. The scanty cellular aspirate of case 2 contained more fibromyxoid or fibrillary stroma than mature hyaline cartilage. Case 3 showed farely abundant benign epithelial cells scattered in isolated form or sheets and a few chondroid mesenchymal fragments.

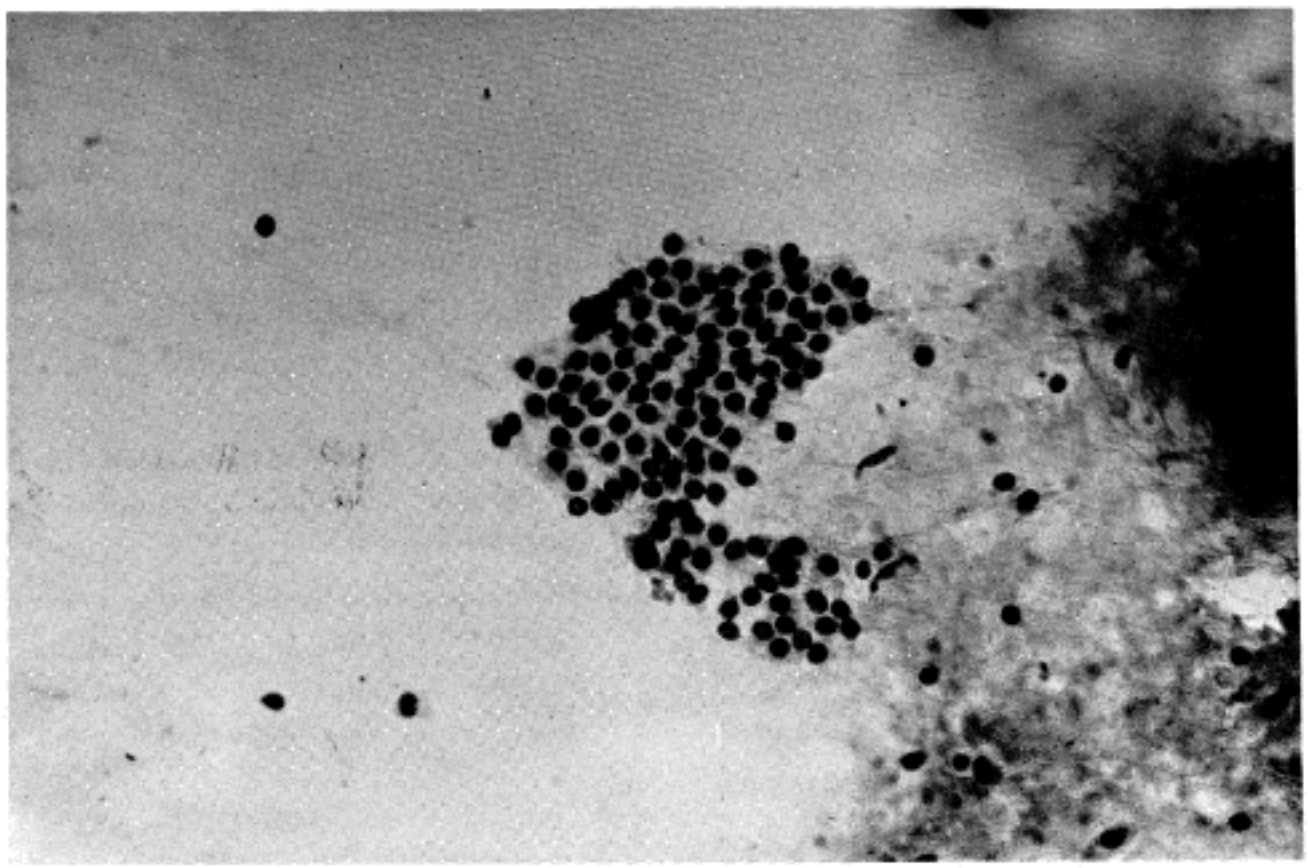

Fig. 2. Nonciliated epithelial cells in the scanty cellular background (Papanicolaou, x80).

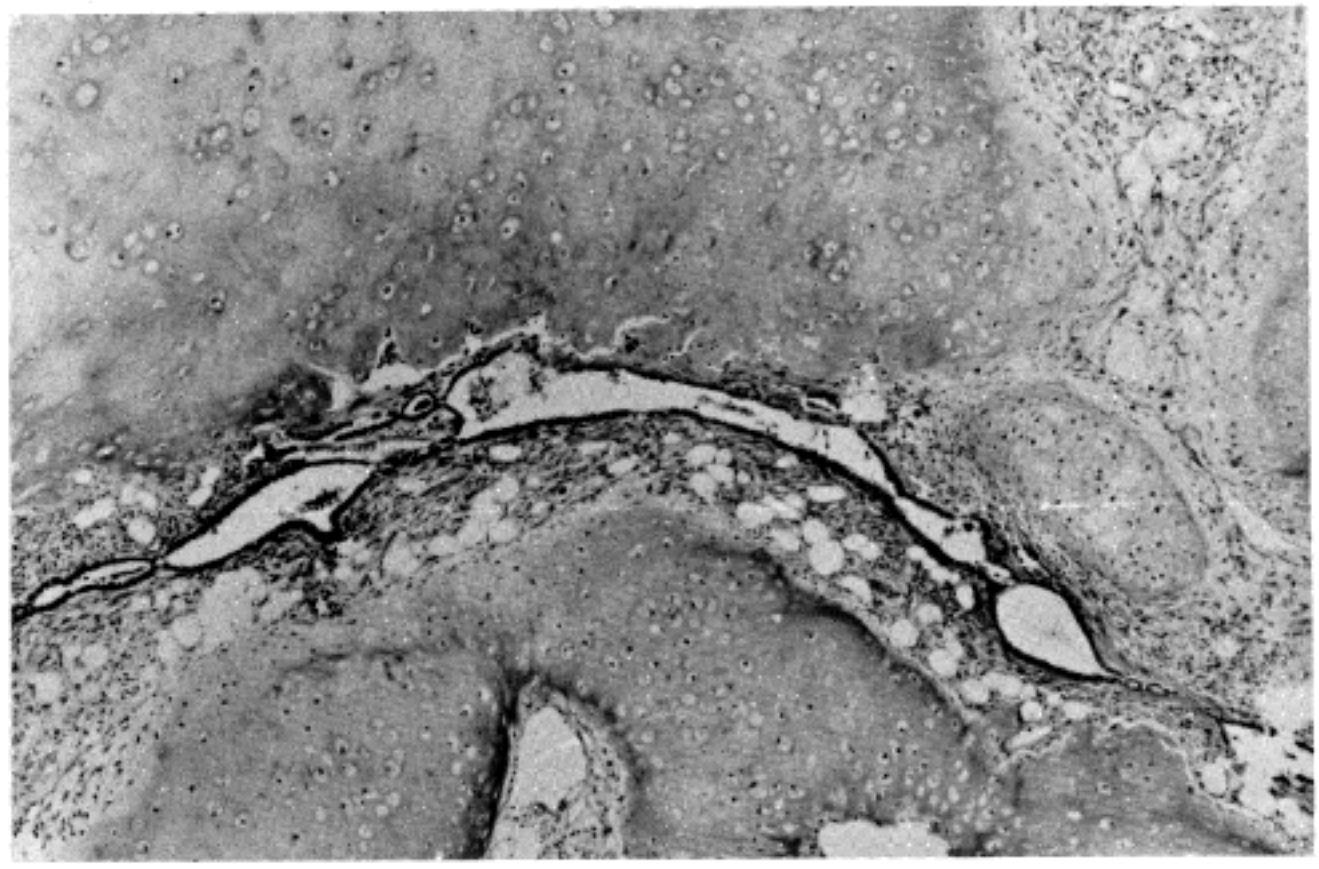

Fig. 3. Histopathological findings of pulmonary hamartoma showing islands of mature hyaline cartilage, cleft-like bronchial epithelium, bundles of smooth muscle, and adipose tissue (H&E, x33).

DISCUSSION

Cytologic diagnosis of pulmonary hamartoma is not always easy, but careful examination of the aspirated material is quite helpful for the diagnosis. Most characteristic and diagnostic finding is carti-

laginous to chondroid mesenchyme or fibromyxoid stroma in the scanty to acellular background[1,2]. Benign nonciliated or ciliated epithelial cells, inflammatory cells including lymphocytes, neutrophils and histiocytes and a small number of fat cells are not diagnostic but usually observed, assuring that the lesion is benign.

The presence of cartilage in the fine needle aspirates of the lung can be explained by a few conditions[2]. One possibility is with incidentally aspirated normal bronchial cartilage. Although theoretically possible, it is very unusual and one would not expect more than one fragmented cartilage and fibromyxoid stroma. Another possibility is the presence of a chondroma. Such neoplasms are extremely rare and the differentiation from hamartoma is of not practical value. Osteosarcoma and chondrosarcoma can also produce cartilage and mesenchyme on fine needle aspiration but malignant cartilage cells or malignant spindle cell elements would be identified.

Pulmonary hamartomas are cytologically characterized as follows.

1) Chondroid or fibromyxoid mesenchymal components.

2) Scanty cellular aspirate or clean background.

3) Scanty to moderate yield of benign epithelial cells-cuboidal or columnar; nonciliated or ciliated.

4) Scattered inflammatory cells-lymphocytes, histiocytes, and neutrophils etc.

5) No evidence of malignant cells.

Awareness of these findings in the examination of fine needle aspiration of solitary lung nodule would be helpful for the diagnosis of pulmonary hamartoma.

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＝국문초록＝

세침 흡인 세포술로 진단된 폐과오종 3예

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폐 과오종 3예의 세침 흡인 세포학적 소견을 보고하였다. 제 1예는 67세 남자로 흉부 X-ray에서 7 cm직경의 좌측 폐 종괴가 우연히 발견되었고 제 2예와 3예는 각각 47세와 53세의 여자로 3 cm 및 2 cm 크기의 우측 폐 종괴를 가지고 있었다. 이들 종괴의 세침 흡인도말은 세포 밀도가 낮았고 여러절편의 불규칙한 모양의 성숙한 초자연골 조직 또는 섬유점액양 간엽성 조직과 양성 상피세포들의 집단을 보였다. 또한 림프구, 중성구 및 조직구 등의 염증 세포들과 성숙한 지방 세포들도 산재되어 관찰되었다. 이런 특징들은 폐과오종에 진단적이였으며, 제 1예는 종괴 절제후 조직학적으로 확진이 되었다. 폐과오종의 감별 진단을 세침 흡인시 연골이 나올 수 있는 경우들의 측면에서 언급하였다.