PULMONARY LYMPHANGIOLEIOMYOMATOSIS

S C Poh
S C Chiang

SYNOPSIS

The case is reported of a 34 year old Chinese woman with pulmonary lymphangioleiomyomatosis. The characteristic clinical, physiological, radiological and pathological features are described. It is the first local report of this rare condition.

INTRODUCTION

Pulmonary lymphangioleiomyomatosis is a rare disorder characterised by hyperplasia of smooth muscle within all portions of the lung. The lesion involves strikingly the wall of lymphatics but muscular proliferation is also seen to involve the walls of blood vessels, bronchioles, alveoli and pleura. A recent article by Carrington et al. (1977) described six cases with emphasis on the unique clinical, physiological and radiological correlations. In an earlier extensive account of the disease, Corrin et al. (1975) reviewed 28 cases including 23 previously unpublished bringing the total reported to 57 cases.

We report another case of this uncommon disease.

CASE REPORT

The patient, a 34 year old Chinese woman, was first seen in August 1974 complaining of sudden onset of breathlessness following an episode of vomiting. She was at that time two months' pregnant. She was diagnosed as suffering from bilateral pneumothorax and this was confirmed radiologically. (Fig. 1) Intercostal tubes were inserted bilaterally and she improved. She was discharged six weeks later, at which time her right lung was fully expanded but there was some residual pneumothorax on the left side. She remained well as an outpatient; a chest radiograph in February 1975 showed full expansion of her lungs with some bilateral reticular shadowing. She had a normal delivery in late February 1975. A repeat chest radiograph in March 1975 (Fig. 2) showed no evidence of pneumothorax. The lungs were clear clinically and there were no abnormal physical findings.

She remained well until September 1975 when she complained of breathlessness and was found to have bilateral pneumothorax again. The lungs did not fully expand with intercostal tube suction and she was referred to the surgeon for an open lung biopsy and a right pleurodesis. This was done in October 1975. The post operative

Department of Medicine (III)
Tan Tock Seng Hospital
Moulmein Road
Singapore 1130

S C Poh, MBBS, AM, FRCPE.
Senior Physician & Head

Department of Pathology
Singapore General Hospital
Outram Road
Singapore 0316.

S C Chiang, MBBS, D. Path, DCP, AM, FRCPA, FCAP, MRC Path.
Pathologist

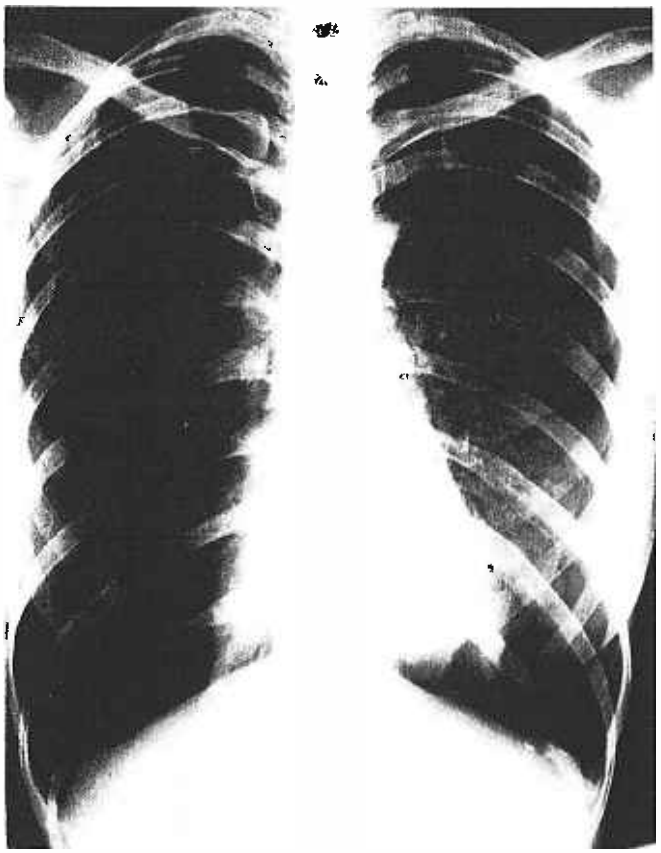

Fig. 1. Initial chest radiograph showing bilateral pneumothorax.

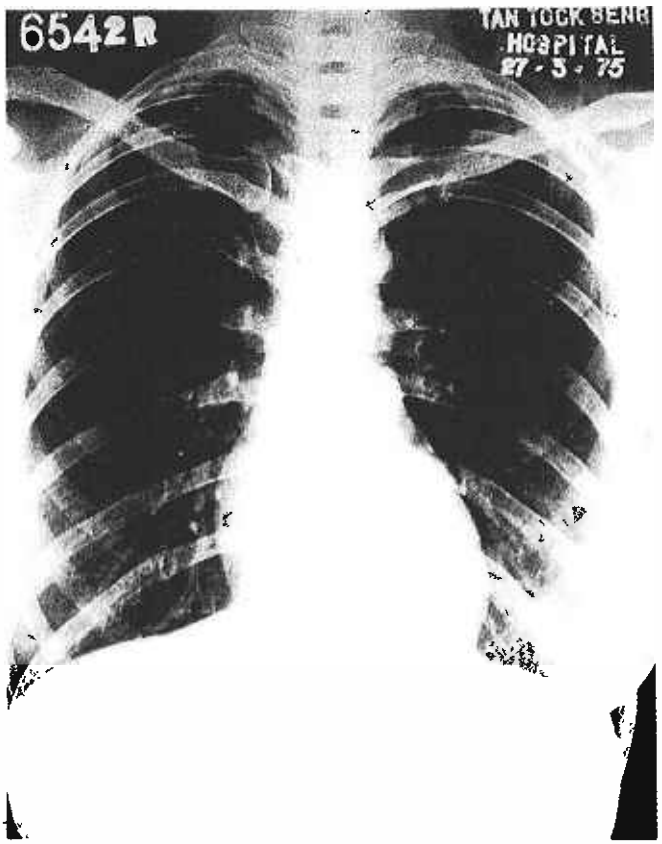

Fig. 2. Chest radiograph taken in March 1975 shows bilateral reticulonodular opacities.

course was uneventful. Hypertonic dextrose solution was introduced into the left pleural cavity three days after the operation. She was discharged two weeks later, still with a small left pneumothorax. A chest radiograph in December 1975 showed full expansion of both lungs. Since then she has remained well except for some breathlessness on exertion.

There is no significant past history of note except she used to work as a hairdresser for 14 years and was exposed to a fair amount of hairsprays. She stopped working in 1972. She does not smoke. There is no family history of mental abnormality or epilepsy.

The tuberculin test was negative. Hemoglobin, total white count, blood urea, serum electrolytes and serum protein electrophoresis were normal. The erythrocyte sedimentation rate was 11 mm per hour. Rheumatoid arthritis and antinuclear factor tests were negative. Serum immunoglobulin estimation showed IgG, IgM and IgA of 2048 mg percent, ≥300 mg percent and 416 mg percent respectively.

Serial lung function tests and chest radiographs were done. The initial physiologic studies revealed diminished lung volumes and diffusing capacity without evidence of airflow obstruction. Over the past three years there is evidence of hyperinflation and airflow obstruction with diminished diffusing capacity. There is no hypoxemia at rest. (Table 1) The chest radiographs show reticulonodular opacities and cyst-like spaces with increasing hyperinflation. (Fig. 3).

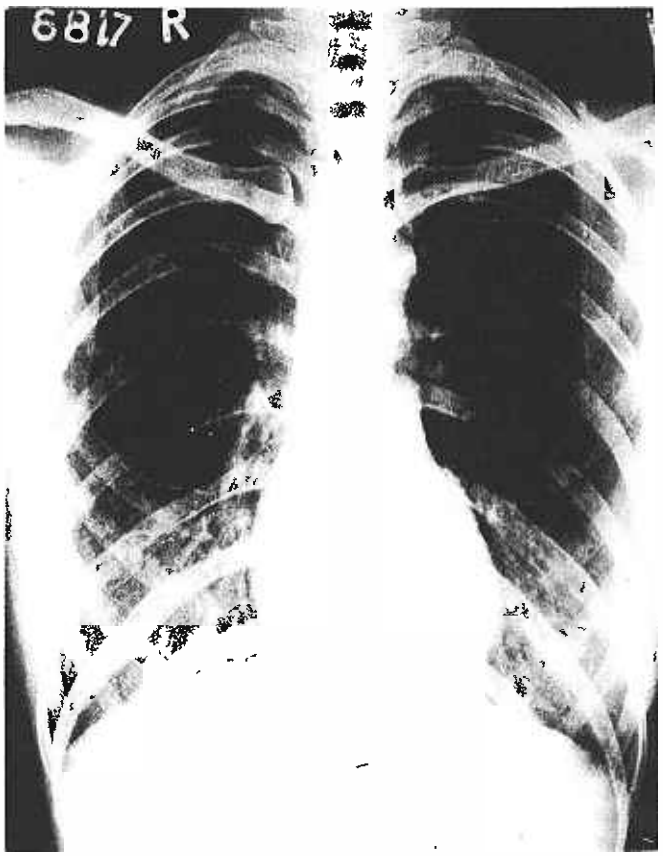

Fig. 3. Chest radiograph taken in April 1978 shows an increase in lung volume, bilateral reticulonodular opacities and a large cyst in the right mid zone.

Operative findings: At right thoractomy dense diffuse pleural adhesions were found. The lung surface was studded with several emphysematous blebs measuring approximately 0.5 to 1.5 cms in diameter. A biopsy was taken from the middle lobe.

Histological findings: Microscopy of the biopsy specimen revealed the pleura to be thickened by fibrous tissue. In several areas the alveolar walls were made prominent by a focal proliferation of muscle fibres and in some areas the proliferation assumed a nodular pattern. (Fig. 4) Cuboidalisation of alveolar lining was also seen. The muscular hyperplasia also involved the bronchiolar walls (Fig. 5) and focal areas of emphysema were present. The walls of several blood vessels were thickened by muscle bundles. (Fig. 6) Lymphatic vessels were similarly involved. (Fig. 7) Only an occasional haemosiderin filled macrophage was seen in the alveolar spaces.

TABLE 1
RESPIRATORY FUNCTION STUDIES

	FEV 1%	VC	FRC	RV	TLC	MMFR	FEV. 75 X40	D_{LCO}	pH	PaCO2	PaO2
April 75	91	1.74 (63)	2.06 (77)	1.48 (99)	3.22 (78)	2.36 (71)	57 (63)	5.5 (32)	—	—	—
June 76	78	2.42 (87)	2.93 (110)	1.66 (111)	4.08 (99)	2.10 (63)	69 (77)	5.8 (34)	—	—	—
April 78	67	2.19 (80)	2.86 (105)	1.88 (120)	4.07 (99)	1.31 (41)	49 (54)	4.6 (28)	7.40	31	88

The FRC, RV & TLC were measured by helium equilibration, and D LCO measured by the end-tidal steady state method.

Figures in parentheses are percent of predicted normal values.

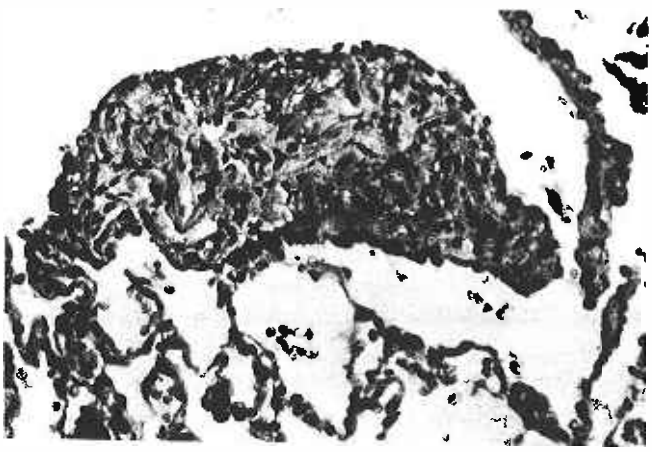

Fig. 4. H. E. Stain. Magnification 250x. showing proliferation of muscle fibres in the alveolar wall giving rise to a "muscle nodule".

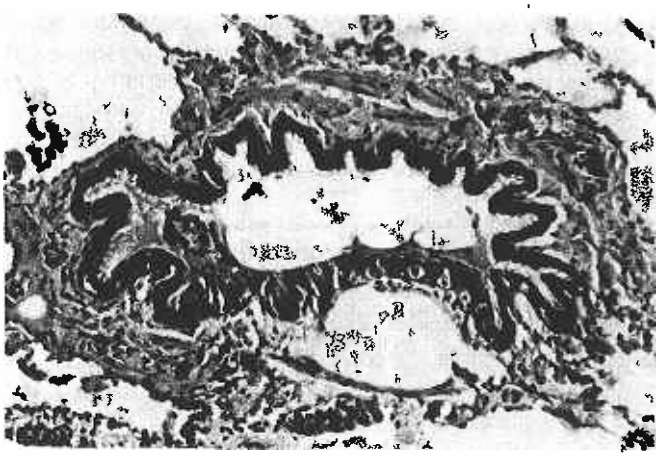

Fig. 5. H. E. Stain. Magnification 250x. A bronchiole showing showing early proliferation of muscle fibres in its wall.

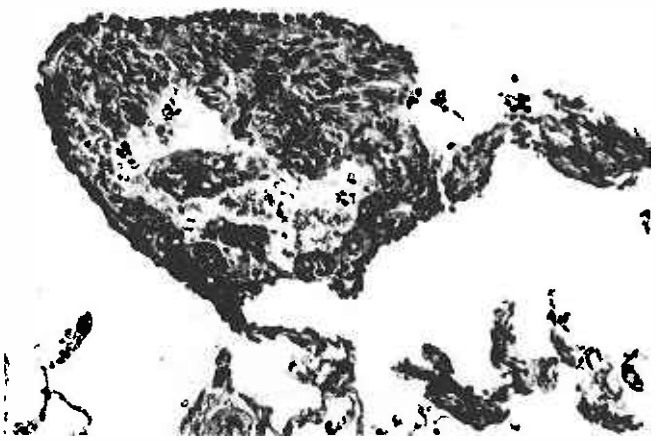

Fig. 6. H. E. Stain. Magnification 250x. A blood vessel showing muscle proliferation in its wall.

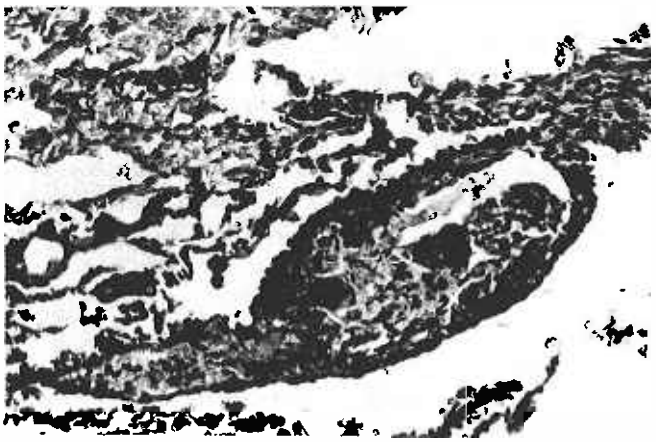

Fig. 7. H. E. Stain. Magnification 250x. A subpleural lymphatic vessel showing proliferation of muscle fibres in its wall.

DISCUSSION

Pulmonary lymphangioleiomyomatosis is a disease of women with symptoms first appearing during the reproductive years. It shows no familial tendency. Although mild and stable or slowly progressive forms may exist (Corrin et al. 1975) patients most frequently present with progressive breathlessness punctuated sometimes by pneumothorax, chylous pleural effusion or hemoptysis and rarely survive more than 10 years from the onset of symptoms, death resulting from respiratory failure.

Uneven obstruction of bronchioles, lymphatics and small pulmonary veins occurs. Gross honeycomb cystic changes appear in the lungs with a diffuse mixed proximal acinar and irregular emphysema. The spectrum of the clinical, physiological and radiological manifestations due to chronic lymphatic, airflow and circulatory obstruction has been well elaborated by Corrin et al. (1975) and Carrington et al. (1977). According to the latter authors, the incidences of the common features in the cases reported were chylous effusions 75%, pneumothorax 39% and haemoptysis 40%. The presenting feature of our patient was breathlessness due to spontaneous pneumothorax, most likely due to rupture of one of the blebs as a result of airflow obstruction and emphysema. Chylous effusion and hemoptysis were not seen in our patient due most probably to the relatively early stage of presentation.

Physiologically our patient shows the characteristic combination of airway obstruction and diffusion impairment. There is evidence of gradual airflow obstruction, shown best in the results of the maximum mid expiratory flow rate. The total lung capacity (by the helium equilibration method) remains about the same due to poor communication of the empty spaces with the airways. The low diffusing capacity has been attributed to the loss of alveolar surface area due to emphysema and from uneven ventilation and perfusion.

Radiologically, the reticulonodular opacities are due to a combination of muscle hyperplasia, lymphatic obstruction and engorgement, venous obstruction and interstitial oedema. Our patient exemplifies the pathognomonic feature of pulmonary lymphangioleiomyomatosis — "a paradoxic picture of an enlarging lung volume with a reticulonodular pattern and cyst-like spaces". (Carrington et al. 1977).

Because of the presence of renal angiofibrolipomas in some reported cases of pulmonary lymphangioleiomyomatosis and the similarity of the pulmonary lesions of lymphangioleiomyomatosis with those of tuberose sclerosis, the question of a possible relationship between the two conditions has been raised. Valensi (1973) in a detailed comparison of the two conditions consider lymphangioleiomyomatosis and the pulmonary lesions in tuberose sclerosis represent "the opposite ends of a spectrum" of presentation of tuberose sclerosis. Spencer (1977), however, regards lymphangioleiomyomatosis as probably a disease sui generis and not a forme fruste of tuberous sclerosis. Stovin et al. (1975) are also of the opinion that pulmonary lymphangioleiomyomatosis and tuberose sclerosis are probably different entities and suggest that pulmonary lymphangioleiomyomatosis is a sex-linked disorder and may be related to congenital pulmonary lymphangiectasis.

Various modes of treatment, including a course of androgens (Bush et al. 1969) have been tried to arrest the progression of the disease without success. Corticosteroids and immuno suppressive therapy were found to be ineffective.

ACKNOWLEDGEMENTS

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