

Radiographic appearances of mycoplasma pneumonia

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ABSTRACT The chest radiographs of 60 adult patients with serologically proven mycoplasma pneumonia were reviewed. Confluent or patchy consolidation was most commonly seen, and involved one lobe only in 40% of patients. Widespread nodular opacities were seen much less frequently (7%). Pleural fluid was rare. Complete resolution was almost invariable, 40% of radiographs having cleared by four weeks and 96% by eight weeks.

Mycoplasma pneumoniae has been shown to be the causative organism in 10-20% of all adult pneumonias.^{1,2} The illness can be of variable severity and while there may be some suggestive clinical features,³ the diagnosis is not usually confirmed until the results of serology are obtained. Early diagnosis based on the radiographic appearance would be helpful as the organism is sensitive only to erythromycin and tetracyclines. However, there is still debate as to the characteristic radiographic appearances of mycoplasma pneumonia, widespread nodular opacities being considered typical by some authors,^{4,5} while others stress the occurrence of confluent consolidation.⁶ In view of these differing opinions, we have reviewed the radiographs of patients with proven mycoplasma pneumonia in order to determine the frequency of the various radiographic patterns that have been described.

Methods

The extent of the radiographic abnormalities in mycoplasma pneumonia, diagnosed over a five-year period, were reviewed by a physician and radiologist together. The 60 subjects consisted of 35 inpatients and 25 outpatients of whom 38 were male and 22 were female (table 1). The ages of the male and female patients were similar, (male mean age 31.9 years, range 12-45; female mean age 34.8 years, range 17-67).

The diagnosis was established either by a four-fold rise in the complement fixing titre or an isolated titre of greater than one in 200 in the absence of positive serology to other organisms or

Table 1 *Age and sex of subjects studied*

Age (yr)	10-20	21-30	31-40	41-50	51-60	61-70	Total
Males	4	12	17	2	3	0	38
Females	3	3	11	2	0	3	22

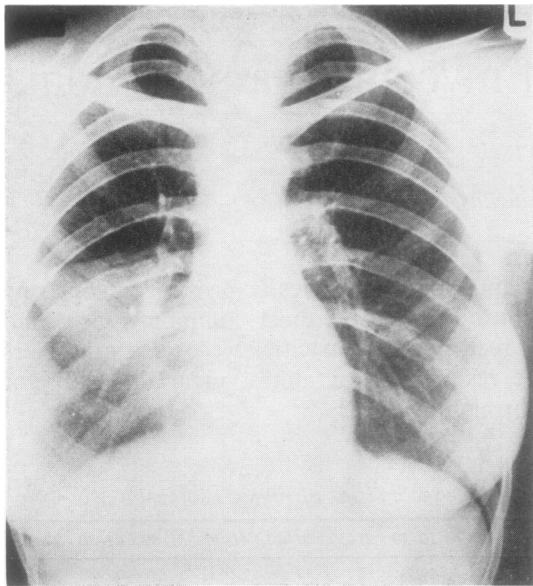
bacterial culture. Patients with other chest or systemic illnesses were excluded.

The extent of the radiographic abnormalities was assessed by the number of lobes involved in each case, and whether there was unilateral or bilateral involvement. The site was, where possible, identified as being upper lobe, middle lobe or lingula, or lower lobe. The pattern was classified as confluent consolidation, patchy consolidation (irregular opacities more than 0.5 cm in diameter with poorly defined margins), or nodular (round or oval opacities less than 0.5 cm in diameter with clearly defined margins). Other features noted were loss of volume, pleural fluid, linear shadows, hilar lymphadenopathy, and abscess formation. The rate of resolution was assessed where follow-up was complete.

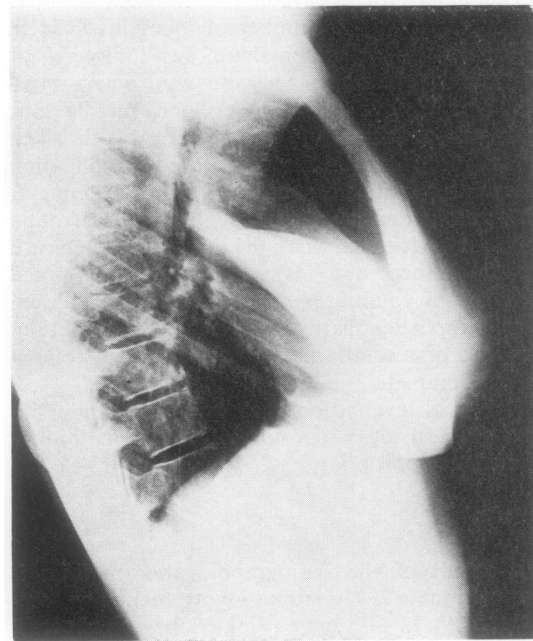
Statistical evaluation was made by the Chi-square test, using Yates' correction for small numbers where appropriate.

Results

The extent of the radiographic abnormalities is shown in table 2. Unilateral involvement was common (65%). In 44% only a single lobe was affected. Widespread involvement throughout both lung fields occurred in only 7%. The site, in the 56 subjects where accurate identification of the affected lobe was possible, is shown in table 3. The lower lobes (77%) were involved more fre-



(a)



(b)

Fig 1 (a) *Confluent middle lobe pneumonia with loss of volume (female, age 17 years); (b) same patient, lateral view.*

Table 2 *Extent of radiographic abnormalities*

	Male	Female	Total
Unilateral	38	22	60
Bilateral	21 (55%)	18 (82%)	39 (65%)
One lobe	17 (45%)	4 (18%)	21 (35%)
All lobes	13 (33%)	14 (64%)*	27 (44%)
	3 (8%)	1 (4%)	4 (7%)

*Sex difference is significant ($p < 0.1$)

Table 3 *Site of radiographic abnormalities*

	Male	Female	Total
Lobe	35	21	56
Upper	12 (34%)	9 (43%)	21 (38%)
Mid/lingula	19 (54%)	9 (43%)	28 (50%)
Lower	30 (86%)	13 (62%)	43 (77%)

quently than the upper lobes (38%). The pattern (table 4) varied between confluent consolidation (fig 1), patchy consolidation, nodular opacities (fig 2), and a mixed picture with both nodular opacities and patchy or confluent consolidation. Confluent or patchy consolidation was relatively more common in females, while nodular opacities were more common in males. When the pattern and distribution of confluent or patchy consolida-

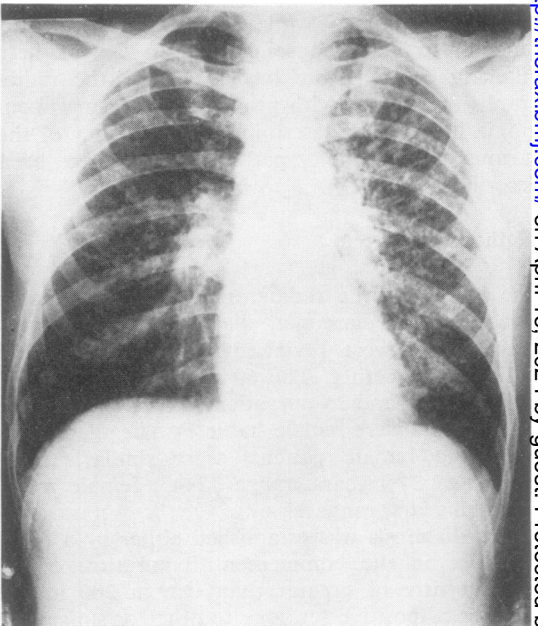
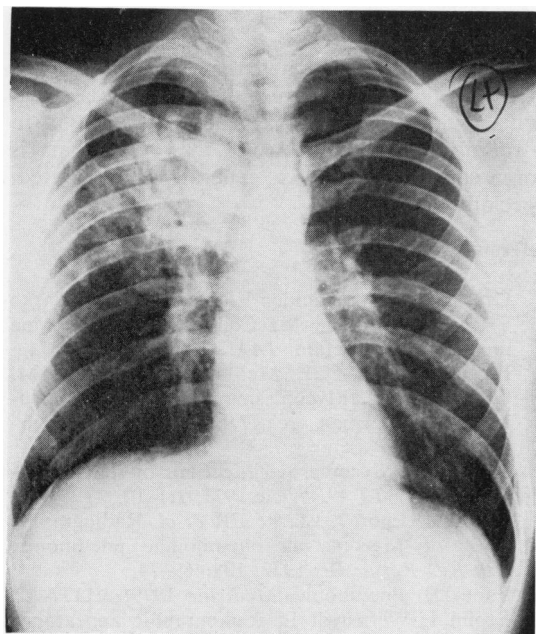
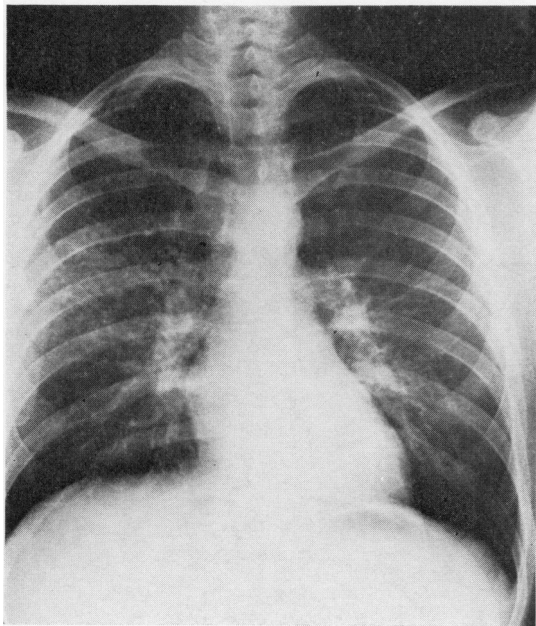


Fig 2 *Widespread nodular opacities throughout both lungs (male, age 44 years).*



(a)



(b)

Fig 3 (a) Confluent consolidation right upper lobe (male, age 26 years); (b) same patient six days later showing resolution of confluent consolidation and the development of bilateral nodular opacities.

Table 4 Pattern of radiographic abnormalities

	Male	Female	Total
Confluent	38	22	60
Patchy	7 (18.5%)	10 (45%)	17 (28%)
Nodular	9 (23.5%)	6 (27%)	15 (25%)
Mixed	11 (29%)	3 (13.5%)	14 (23%)
Unilobar	11 (29%)	3 (13.5%)	14 (23%)
confluent/patchy	11 (29%)	13 (59%)*	24 (40%)

* Sex difference is significant ($p < 0.05$)

tion occurring in a single lobe was considered, this sex difference was significant ($p < 0.05$).

Extension of the radiographic abnormalities into previously clear areas was only seen in two subjects (fig 3), both of whom were on appropriate treatment at the time. Nodular opacities were seen to develop into patchy consolidation in two cases, although the reverse was not observed. Loss of volume was seen in five cases with confluent consolidation, and in one case with patchy consolidation. Hilar lymphadenopathy and abscess formation were not seen. Small pleural effusions were seen in four cases, but in only one was the fluid present on the initial film. Pleural fluid developed later in the illness in three patients, two of whom were on appropriate treatment at the time.

Resolution was complete in 52 of the 53 patients available for follow-up. Linear shadowing persisted in one young man who had confluent middle lobe pneumonia and was also seen during the process of resolution in four other cases. The rate of resolution is difficult to assess in a retrospective study, but of all the radiographs taken four weeks after the onset of symptoms, 40% were normal, and at eight weeks, 96% were normal.

There was no relationship between the radiographic appearances and either the age of the patient or the duration of symptoms before the initial radiograph.

Discussion

This study confirms the variable nature of the radiographic abnormalities in mycoplasma pneumonia. Although this is often stated to be a disease of the young adult,⁷ 21 of our patients were over 35 years and three over 60 years old. The predominant unilateral and basal distributions have been noted in other studies.^{6,8} Two distinctive patterns emerge—confluent consolidation localised to one or two lobes, and nodular opacities, either localised or widespread. It is frequently difficult to make a clear distinction between confluent and

patchy consolidation and they can be considered as differing degrees of the same pathological process.⁶ However, confluent or patchy consolidation occurred with nodular opacities in 14 subjects, giving a mixed picture. Confluent or patchy consolidation, when confined to one lobe, was significantly more common in females and the nodular pattern was more common in males. This sex difference has been suggested previously, but remains unexplained.⁶ Unilobar confluent consolidation, with or without some degree of collapse, is the classical radiographic appearance of pneumococcal or other bacterial pneumonia. However, it occurs sufficiently often in mycoplasma pneumonia to make it an unreliable diagnostic sign of bacterial pneumonia.

Extension of the radiographic abnormalities into previously clear areas is sometimes said to be characteristic of mycoplasma pneumonia,⁹ but was observed in only two of our patients. Similarly, development of patchy consolidation from nodular opacities was only seen twice and the reverse sequence not at all. Only four small pleural effusions were seen, supporting the general impression that pleural fluid is rare.

Convincing lymphadenopathy was not seen, but our youngest patient was aged 12 years and lymphadenopathy with mycoplasma pneumonia may be more common in children than in adults. Although often considered to be a mild pneumonia with rapid resolution, only 40% of the radiographs taken four weeks after the onset of symptoms were

normal. However, complete resolution was seen in all but one case.

This study demonstrates that there is no distinctive radiographic feature of mycoplasma pneumonia and that there is considerable variation in its radiographic appearance. Lobar pneumonia is more common than is generally appreciated, especially in females.

References

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