Chyliform (Cholesterol) Pleural Effusion*

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Chyliform pleural effusions are a little known occurrence only sparingly reported in the literature. At the lung department in Uppsala, Sweden, 11 cases have been seen the last few years. Typically, the exudate develops in a long-standing pleural thickening resulting from therapeutically pneumothorax many years earlier. The exudate contains a high level of cholesterol, probably breakdown products from blood cells. It is usually sterile, and only very rarely can one find tubercle bacilli growing from it. There is a tendency toward recurrence. If the patient benefits clinically from aspiration of the fluid, decortication is indicated.

Chyliform pleural effusion is a term given to all high-lipid pleural effusions that are not chylous. It is not a common condition, though it is less rare than might be expected from the fact that until 1961, only 99 cases had been reported in the literature. A number of patients with such effusions have been seen at our clinic in the last few years, and since it seems that little has been published on this entity, and that it has some clinical aspects of importance, these cases are described here.

Patients and Methods

Patients with milky or turbid fluid pleural exudate found in long-standing pleural lesions, and in whom empyema and chylorhox had been excluded, were diagnosed as having chyliform pleural effusion. The concentration of cholesterol in the pleural fluid was usually determined, and in most cases, cultures were made for tuberculosis, aerobic and anaerobic bacteria, and fungi.

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Table 1—Patient Summaries

<table>
<thead>
<tr>
<th>No.</th>
<th>Sex</th>
<th>Pneumothorax Treatment</th>
<th>Antituberculous Chemotherapy</th>
<th>Thoracocenteses</th>
<th>Amount, ml</th>
<th>Cholesterol, mg/dl</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>1947-56</td>
<td></td>
<td>1983 once</td>
<td>250</td>
<td>1,660</td>
<td>Bronchopleural fistula after aspiration.</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>1950</td>
<td>1949-51</td>
<td>1976-1982</td>
<td>23</td>
<td>300</td>
<td>January 1983 decortication, has since been well.</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>1941-46</td>
<td>. . .</td>
<td>1983</td>
<td>500</td>
<td>1,268</td>
<td>No fluid increase after aspiration.</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>1942</td>
<td>1950-52</td>
<td>1982-83, 4 times</td>
<td>3,700</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Too much cholesterol, analysis not possible.

RESULTS

Since 1979, 11 patients fulfilling the criteria for chyliform pleural effusion have been seen (Table 1). In one of them (case 5), the condition had already been recognized before 1969.

All patients had been treated with artificial pneumothorax for active tuberculosis, and this treatment had left considerable pleural thickening. Most of them had received one or more courses of antituberculosis chemotherapy. In the typical case, the pleural thickening increased very slowly, and the change was hardly visible from year to year, but when a roentgenogram was compared to one obtained 20 or more years previously, the increase in size was striking.

Thoracocentesis was performed at least once in all patients. In eight of them, this was done once or twice only. In five of these eight patients, the fluid had not reaccumulated; one of them is the only one who showed a positive culture for tubercle bacilli, and since treatment, there has been no recurrence. In one of the eight patients, the fluid has reformed, but the patient has refused further thoracocenteses, and two patients...
have been followed only for a few months as yet. In the eighth patient in this group (case 1), a bronchopleural fistula developed after the thoracocentesis.

Three patients have undergone more than two thoracenteses. An extreme case is patient 5, with 23 aspirations over six years, yielding a total of almost 17 L of fluid. In two patients, decortication has been performed with good result; the third, who has refused operation, is described below.

The cholesterol concentrations in the pleural fluid are given in Table 1. Unfortunately, this measurement was not always made. It was in the first thoracenteses, i.e., those performed after the longest time without disturbance, that the highest values were found. Cholesterol crystals were a common finding in the fluid and was seen in at least five cases.

In addition to the patients described above, three more are being seen regularly because of a pleural thickening which has more than doubled in size compared with 20 years ago. These patients are free from symptoms and refuse treatment.

Two typical patients are described more fully as follows:

Case 4

A woman, born in 1917, was treated with a right-sided pneumothorax for tuberculosis from 1946 to 1953. In 1950, chemotherapy was added and this was continued for two years. After the pneumothorax, a thickened pleura remained (Fig 1). In 1969, bronchial asthma developed, and this worsened over the years. In 1979, the patient was hospitalized for the first time because of respiratory symptoms, and it was noted that the pleural thickening had increased in size. In 1984, the maximum width of the pleura was 2 cm, and in 1979, it had increased to 9 cm. This increase had been very insidious.

Thoracocentesis yielded 300 ml of milky fluid and was repeated a month later. The patient's respiratory condition was remarkably improved by this aspiration, and her asthma has since remained fairly stable. There has been only minimal recurrence of the fluid.

Case 9

This man was born in 1920. He was treated with a right-sided pneumothorax for tuberculosis from 1945 to 1947. In 1950, the tuberculosis was found to have recurred, as proved by a positive sputum culture. In 1952, a pleural effusion was observed on the right side and culture of this fluid also yielded tubercle bacilli. The patient received antituberculosis chemotherapy from 1950 to 1951, 1952 to 1953, 1955 to 1957, and 1973 to 1974. The last two treatments were given because of slight increase in pleural thickening, despite the absence of any bacillary growth (Fig 2).

In 1967, a right-sided thoracocentesis yielded 400 ml of thick chocolate-colored fluid. During the next 15 years, the patient was in good health with only very slowly increasing breathlessness, which, in December 1982, had progressed to a stage at which he had difficulty in climbing stairs. He has since had five thoracocenteses. Whenever he cannot climb two flights of stairs without a rest, he attends the clinic and about 800 ml of pleural fluid is aspirated. The

Figure 1 (Case 4). A (top), 1950: right-sided therapeutic pneumothorax. B (middle), 1962: thickened pleura remaining after treatment. C (bottom), 1979: maximum width of pleural thickening before aspiration.
patient knows exactly when enough fluid has been removed, when he feels an unpleasant strain in the chest. At the same time, the physician feels that the fluid, which until then has been effortlessly aspirated, requires suction for further removal.

Repeated cultures of all types have been negative. Early in 1984, a new course of chemotherapy including isoniazid and rifampin, was initiated, but this has not prevented reaccumulation of the fluid. The patient refuses operation.

**Discussion**

Chyliform, or as it was previously called, cholesterol pleural effusion, has been known since the last century, but not many cases have been described in the world literature. A chronic pleural effusion surrounded by a thickened and fibrotic pleura is the basis of its formation. The most common cause of this pleural reaction is former pneumothorax treatment or tuberculous pleurisy, but it has also been described in rheumatoid arthritis. Differentiation from chylorax is made on the basis of the history, and more important, of the triglyceride level in the effusion fluid, which is high in chylorax. Unfortunately, measurement of triglyceride level has not been routine in our department, and was only done in three instances, when it was invariably low.

The cause of the increased cholesterol concentration is unknown, but it is thought to be the result of breakdown of mainly red and white blood cells. The cholesterol level depends largely on the length of time for which the effusion has been left undisturbed. This agrees with the present study.

There is probably a fluid layer in the center of most old pleural thickenings remaining after artificial pneumothorax. Why this fluid should slowly increase, causing compression of the lung, is an open question. Infection was ruled out in all patients except one, in whom signs of active tuberculosis were found in the exudate, which had a very high cholesterol content (case 3). The exudate had probably been present for a long time before it became infected. Tuberculosis is not commonly found in such exudates, but chemotherapy is recommended in all cases where effective treatment has not been given earlier. In the present series, such treatment was of no avail except in the patient in whom tuberculosis was present.

Aspiration is usually possible only to a certain point, after which the patient feels discomfort and force has to be used to remove more fluid. At this stage, further aspiration is probably not beneficial. Aspiration can be complicated by a bronchopleural fistula, but more probably, this is a complication of the cholesterol pleurisy itself, and the risk would actually be greater if repeated aspirations were not performed.

As is evident from this series, in a number of patients, the effusion will reaccumulate within some months. In these cases, decortication is indicated, provided, of course, that the patient’s clinical condition is improved by the aspirations.

**References**