The Cause of a Pleural Effusion Diagnosed by a Fixed Gas-Bubble*

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A 14-year-old girl was referred to the hospital for dyspnea and an intermittent right-sided pain in the chest. She was suffering from recurrent high fever, nausea, vomiting, pain in epigastrium, and diarrhea for four days. She had never been seriously ill. She was not abroad recently.

Beside a high fever of 40.8°C rectally, no further abnormalities on physical examination were found. Laboratory investigations showed ESR of 70 mm in the first hour and WBC of 12.8 × 10^9/cu mm. A chest x-ray film taken on admission was interpreted as being normal.

Because a bacterial infection was suspected, treatment was started with broad spectrum antibiotics. However, the clinical picture did not improve in the following six days. Considering the possibility of an abdominal abscess, an ultrasonographic examination was performed and detected a right-sided pleural effusion only. This finding was confirmed by a chest x-ray film including a lateral view (Fig 1 and 2). Five hundred milliliters of hemorrhagic fluid was evacuated. The protein content was 45 g/L, bacteriologic cultures were negative, and at cytologic examination, inflammatory cells were seen. The chest x-ray pictures taken after the evacuation showed only a minor decrease of the pleural fluid level.

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**Diagnosis: Retroperitoneal abscess**

The chest x-ray film on admission is normal. The x-ray picture taken on the sixth day of hospital stay showed a pleural effusion (Fig 1 and 2) and also a subdiaphragm gas bubble with a fluid level located on the posteroanterior view in the liver shadow and on the lateral view in the retroperitoneal space. The presence of retroperitoneal gas bubbles is the most specific roentgenographic finding of a retroperitoneal abscess.

To verify the diagnosis, a plain film of the abdomen, excretory urography, ultrasound examination, and a barium study of the large bowel were performed. The diagnosis of retroperitoneal abscess was best demonstrated on the x-ray films of the large bowel showing leakage of contrast (Fig 3). The appendix did not fill.

Retroperitoneal abscesses usually originate from pyelonephritis and pancreatitis or following trauma, tuberculosis, and bowel perforations.1-3 The probable cause in our patient was perforation of a retrocecal appendix.4 The symptoms typically include nonspecific, nonlocalized abdominal pain and other gastrointestinal complaints and constitutional symptoms such as chills, sweating, fever, or malaise.3 Laboratory studies are not very helpful. In general, several roentgenographic studies are necessary to establish the diagnosis. Computed tomography is of great value in some cases.3,5 The interval between admission and the diagnosis is often rather long with a mean of about two weeks.3 Treatment is usually operative. Some of the patients recover spontaneously as did our patient. Nevertheless the mortality rate is about 30 percent.1-3

Just the specific finding of fixed gas bubbles in the retroperitoneal space on plain chest x-ray films points immediately to the cause of pleural effusion, ie, retroperitoneal abscess.

**REFERENCES**