Multiple Pulmonary Nodules in a Young Man*

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A previously healthy 33-year-old man presented with complaints of dyspnea on exertion, abdominal pain, and right flank pain. Heart rate was 68/min, blood pressure 140/80 mm Hg, and body temperature 37.0° C. Heart and lungs were normal. There was mild hepatomegaly. The hematocrit was 32 percent, the white cell count was 8,500, of which 64.5 percent were neutrophils and 4 percent were eosinophils. There were 22,000 platelets, and a sedimentation rate of 84 mm per hr. The blood urea nitrogen was 36 mg percent, serum creatinine 1.0 mg percent, total bilirubin 0.4 mg percent, glutamic oxaloacetic transaminase 8U, and the serum protein 7.5 g percent (albumin 3.6 g percent and globulin 3.9 g percent). There was a trace of proteinuria, and three stool specimens were negative for occult blood. An intravenous pyelogram, upper gastrointestinal series, and barium enema were normal. A chest roentgenogram was obtained (Fig 1).
Diagnosis: Echinococcus alveolaris of the lung

The chest roentgenogram (Fig 1) shows multiple small nodules in the lung. The diagnosis of Echinococcus alveolaris was established by an open lung biopsy. In addition, on laparoscopy, an invading growth of Echinococcus alveolaris was observed. Indirect immunofluorescence for echinococci was positive with a titer of 1:640 and the positive hemagglutination test exhibited a titer of 1:4860. Hemihepatectomy was complicated by an ileus and the patient died two weeks later from septic-toxic shock. At necropsy, the remainder of the liver was free of Echinococcus cysts. There was portal vein thrombosis and diffuse purulent peritonitis.

There are two distinct helminthic diseases caused by larval cestodes of the echinococcal type: unilocular hydatid disease (Echinococcus granulosus) and the less common alveolar hydatid disease (Alveococcus multiocularis). Unlike the ubiquitous Echinococcus granulosus, the latter type only occurs in certain endemic areas: southern Germany, Switzerland, northern US, Canada, and Japan, as well as in some areas of the USSR.

Both parasites require two hosts for development, herbivores as intermediate hosts and carnivores as definitive hosts. Man is accidentally infected by the ingestion of eggs, and represents an intermediate host. In contrast, in the final host, the fully developed parasite usually does not cause the disease. In both types of Echinococcus, the onchospheres (infective embryos) leave the egg in the intestine of the intermediate host and reach the liver via the portal vein. While Echinococcus granulosus forms distinct cysts encapsulated by connective tissue, the Alveococcus proliferates by budding outwards into the surrounding host tissue, similar to a malignant neoplasm. It can produce metastases in the brain, lungs, and several other organs. The disease is usually fatal. Multiple lung lesions are rare. A solitary lung lesion or pleural effusion is more frequent. Pulmonary manifestation of Echinococcus disease may be due to diaphragmatic penetration.

The cysts of Echinococcus granulosus can usually be removed surgically and result in complete recovery. In contrast, because of the growth characteristics of Alveococcus and its usually late discovery, surgical cure is practically impossible. Nevertheless, reduction of the parasitic mass by extensive liver resection, and consecutive chemotherapy (eg with Mebendazole) may become the best treatment of alveococcosis of the liver. As yet, there are no controlled studies available to demonstrate the efficacy of this combined approach, but it is a promising alternative to immunostimulation, cytosstatics, and radiotherapy, all of which have failed in the past.

REFERENCES