Philip A. Mackowiak, Section Editor

Man with Syncopal Episodes and Abnormal Chest Radiograph Findings

(See page 1755 for the Arcanum)

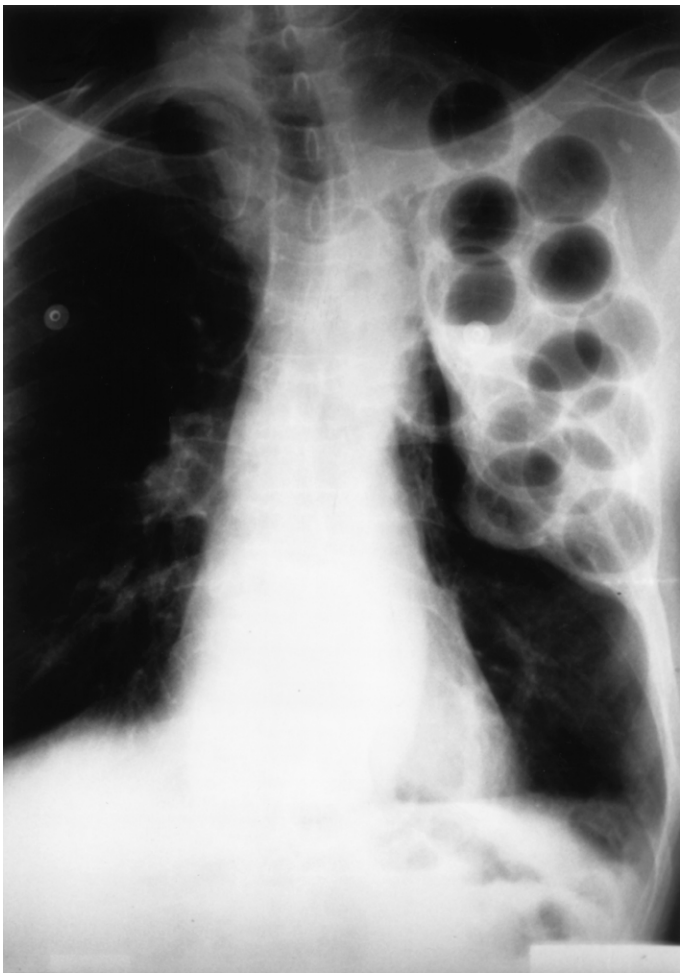

Figure 1. Posteroanterior chest radiograph of a 78-year-old man with a history of benign prostatic hypertrophy and diverticulosis. Plombage balls are present in the left upper lobe.

Answer: Plombage therapy.

The patient was diagnosed with cavitary pulmonary tuberculosis (TB) in 1945 and was admitted to Battey State TB Hospital, the state TB hospital in Rome, Georgia. He underwent a plombage procedure in the late 1940s, after he was transferred to a Veterans Affairs Hospital in North Carolina (figure 1). The patient also remembered receiving very painful, daily streptomycin injections as part of an "experiment."

Before the introduction of antituberculous chemotherapy with streptomycin in 1947, surgical therapy was considered to be the definitive treatment of TB, especially cavitary disease. The overall goal of surgical therapy was to close the cavity in an attempt to physically reduce the bacillary load and also to reduce the oxygen tension in the lungs, making the environment less hospitable for *Mycobacterium tuberculosis,* to ensure healing. Artificial pneumothorax was used in conjunction with bed rest during the first part of the twentieth century until other, more effective forms of collapse became available. Ar-

Figure 2. Lucite balls for plombage therapy, used until the 1950s, on display at the former Battey State Tuberculosis Hospital in Rome, Georgia

tificial pneumothorax fell out of favor, because it became evident that a pneumothorax was difficult to maintain after pleural adhesions, and pleural empyemas often developed [1]. Other surgical procedures employed included phrenic nerve crush, thoracoplasty, pneumoperitoneum, Monaldi drainage, and pneumonolysis (extrapleural and extraperiosteal), also known as plombage therapy. Plombage is derived from the French word "plombe," literally meaning lead, but it refers to placing any inert object against the lung to collapse the underlying cavity.

Pneumonolysis was first performed by Tuffier in 1891, using an extrapleural approach [2]. Pneumonolysis was used to collapse tuberculous cavities in cavitary apical disease. After dissecting the chest wall, the intrathoracic space was filled with various substances to collapse the underlying cavity by external compression. Items used included fat, air, oil, and paraffin, before Wilson first used methyl-methacylate spheres (i.e., lucite balls) in 1945. Figure 2 shows lucite balls used to treat pneumonolysis, which were used until the 1950s, on display at the former Georgia TB Hospital (Battey State TB Hospital). Another approach to pneumonolysis was a subcostal approach, in which the periosteum was dissected away from the ribs, and a pocket was created inside the ribs and outside the periosteum and intercostal muscles [1].

Pneumonolysis was considered to be a safer method of collapse therapy than thoracoplasty, which was fraught with complications. Thoracoplasty often required a multiple-stage procedure, was very painful, and caused significant respiratory compromise and physical deformity. Pneumonolysis, on the other hand, involved a single operation and preserved respiratory function, although it did cause deformity of the chest wall. Pneumonolysis also had an advantage in that it could be used for patients with more-advanced disease and bilateral disease [3].

Later, complications developed that caused the procedure to eventually fall out of favor. Early complications were few, but included acute dyspnea, mediastinal shift, superior vena cava syndrome, and even urticaria [4]. An empyema could also form, if the cavity necrosed through the pleura as a result of the external pressure and created a fistulous tract. Late complications involved TB infection in tissue surrounding the spheres, draining sinus tracts, and spheres migrating subcutaneously (even into the mediastinum) [4]. Modern reports have described hemorrhages, migration of the spheres, and fistulization to the bronchus, aorta, esophagus, and even the skin [3, 5, 6].

In the late 1940s, streptomycin became available to treat TB, and subsequently, para-aminosalicylic acid was developed, which paved the way for multidrug therapy. With the advent of chemotherapy, the need for surgical procedures decreased. Patients were cured more effectively and without the feared consequences of surgical complications. However, the development of the various surgical procedures used to treat TB allowed for the development of thoracic surgery as a modern surgical specialty.

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