Photo Quiz: Mysterious Spheres on a Chest Radiograph

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By Moises Auron, MD [1]

In plombage therapy for pulmonary TB, polymerized methyl methacrylate, or Lucite, balls were inserted into the chest to collapse the lung and to maintain adequate thoracic expansion.

An elderly Asian man is brought to your office by his family for a routine physical examination. The patient speaks no English. The family is not well acquainted with his medical history; however, they know he was “sick” as a teenager and had some type of chest surgery.

The patient has been healthy since immigrating to the United States 20 years ago. He denies any chest pain, shortness of breath, or recent weight gain or loss. As part of his examination, baseline chest radiographs are obtained.

What are you looking at here?

Photo Quiz–Answer
Lucite-ball plombage
Because of the difficulty in treating pulmonary tuberculosis medically during the early to mid 20th century, adjunctive surgical techniques were developed, particularly for cavitary disease. These included excisional surgery, cavitary drainage, and collapse therapy. The morbidity and intraoperative mortality associated with these procedures were elevated, especially when upper lobe cavities persisted and patients were unable to tolerate lung resection. This prompted the development of other surgical techniques, one of which was extrapleural pneumonolysis—also known as plombage therapy.

Figure – This patient’s anteroposterior and lateral chest films show the characteristic radiographic appearance of Lucite balls: multiple, perfectly round lucencies, closely packed at the apex of the hemithorax.
Plombage refers to the placement of any inert object against the lung to collapse the underlying cavity. Polymerized methyl methacrylate, or Lucite, balls—similar in size and form to Ping-Pong balls—were inserted into the chest to collapse the lung and to maintain adequate thoracic expansion. These spheres were supposed to be nonirritating to adjacent tissue, noncarcinogenic and nonantigenic, insoluble, slightly resistant to roentgen rays, round and easily fitted into any space, lightweight to prevent erosion or migration, and able to float (in case fluid developed). The assumption was that the spheres stimulated a thin, strong, dense, fibrous membrane that could prevent the spread of disease beyond its surface.

Lucite spheres caused numerous complications, including migration and erosion into adjacent structures, extrusion of foreign material or fluid into the chest wall, hemoptysis, intestinal obstruction, vocal cord palsy, major vascular erosion, tracheal compression, malignancy (epithelioid angiosarcoma, squamous cell carcinoma, and lymphoma), empyema, and sinus tract formation. These complications necessitated removal of the Lucite balls and repair of the affected tissue, at times involving decortication and thoracoplasty. Although the need for surgical intervention has significantly decreased because of advances in the medical treatment of tuberculosis, clinicians may still encounter patients who underwent Lucite-ball plombage. When evaluating these patients, it is important to confirm that they subsequently received appropriate therapy for tuberculosis.

References: REFERENCES:
20. Ohotsuka T, Imura Y, Yamamoto H, Kukita T. A case of empyema after plastic ball plombage cured...


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