CASE REPORTS

Intrathoracic Gossypiboma Interpreted as Bronchogenic Carcinoma. Another False Positive With Positron Emission Tomography

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Gossypibomas from inflammatory reactions to textile foreign bodies are a rare postoperative complication and are easily confused with neoplastic processes because of their diversity of symptoms and radiographic signs. Positron emission tomography (PET) is seldom used to diagnose gossypibomas and PET findings can result in false positives for a diagnosis of neoplastic disease. We describe the case of a 56-year-old man in whom PET findings showed an intrathoracic mass suggesting a tumor. The final diagnosis was gossypiboma, identified 23 years after pneumothorax surgery.

Key words: Positron emission tomography. False positive. Retained surgical sponge (gossypiboma). Intrathoracic mass. Bronchogenic carcinoma.

Introduction

Intrathoracic gossypibomas, or intrathoracic textilomas, are the result of a secondary inflammatory reaction to textile material left in the chest cavity. Although they are rare, they have serious postoperative medical and legal implications. In x-rays, gossypibomas appear as intrathoracic masses that mimic intrapulmonary abscesses, aspergillomas, or tumors. Their low incidence, variety of symptoms and nonspecific radiologic findings, which occasionally lead to false positives, mean that this entity can be easily confused with neoplastic processes because of their diversity. Positron emission tomography (PET) is seldom used to diagnose gossypibomas and PET findings can result in false positives for a diagnosis of neoplastic disease. We describe the case of a 56-year-old man who had previously undergone chest surgery in whom computed tomography (CT) and positron emission tomography (PET) findings showed a growing intrathoracic mass that was suggestive of a tumor. The final diagnosis was intrathoracic gossypiboma.

Case Description

A 56-year-old man with a medical history of perennial rhinitis, persistent but mild bronchial asthma, and sensitization to the house dust mite had been a smoker of 37 pack-years until 6 months before the consultation. There was no evidence of chronic mucosal hypersecretion and the patient was not an abuser of nonprescription drugs or alcohol. He had undergone right and left upper lobe bullectomies in 1980 and 1981, respectively, as a consequence of recurrent spontaneous pneumothoraces. Postoperative recovery was slow after both interventions; fever that developed after the left thoracotomy resolved with antibiotic therapy.

The patient consulted in regard to symptoms that had lasted a month, namely, cough, thick, purulent sputum with mucus plugs, dyspnea in response to moderate effort, and left pleuritic pain. The patient occasionally had a low-grade fever and produced blood-stained sputum, but there was no clear sign of weight loss and wasting. The physical examination revealed a generally good state of health, with normal breathing at rest, normal blood
Intrathoracic gossypibomas are the result of an inflammatory reaction to foreign bodies in the form of textile material left in the thoracic cavity. The term "gossypiboma" derives from the Latin *gossypium* (cotton) and the Swahili *boma* (place of concealment). Gossypibomas are also referred to as textileomas or retained surgical sponges. Although they are a rare complication that occurs in 1 in 1000 to 1 in 3000 procedures, they can have serious consequences.

**Discussion**

Intrathoracic gossypibomas are the result of an inflammatory reaction to foreign bodies in the form of textile material left in the thoracic cavity. The term *gossypiboma* derives from the Latin *gossypium* (cotton) and the Swahili *boma* (place of concealment). Gossypibomas are also referred to as textileomas or retained surgical sponges. Although they are a rare complication that occurs in 1 in 1000 to 1 in 3000 procedures, they can have serious consequences.

The number of intrathoracic— as compared to intraabdominal— gossypibomas described in the literature is relatively small. The real incidence is difficult to ascertain from the reviewed literature, probably because some cases remain asymptomatic and are never diagnosed, but also because some are probably not reported given the medical and legal implications. The incidence has been estimated as between 1 in 1000 and 1 in 3000 procedures.

Gossypiboma presentation is variable, depending on the location of the gauze and the type of reaction it causes. The typical acute presentation is a local, exudative, and highly symptomatic inflammation, which tends to develop into an abscess and lead to the formation of a fistula. This acute presentation requires differential diagnosis to rule out postoperative collections such as hematomas and abscesses. The most common presentation is an aseptic granulomatous reaction with fibroblastic activity that fully encapsulates the foreign body. Patients who have the latter type of reaction may remain asymptomatic or oligosymptomatic for months or even years. This was the case of our patient, who developed cough and recurrent blood-stained sputum 23 years after pneumothorax surgery.
A range of radiologic findings in simple radiographs, ultrasound and magnetic resonance images, or CT and PET scans have been described for gossypibomas —particularly for those found in the abdomen. Simple radiography is the most frequently used diagnostic technique, followed by CT, which is the technique of choice for detecting gossypibomas and possible complications. Many authors consider a gossypiboma to be specifically indicated by a CT finding of a low-density heterogenous mass with an external high-density wall (further highlighted by a contrast medium), and with a spongiform pattern containing air bubbles. A radiopaque mark—which is simply a radiological tracer carried by most surgical gauzes—is another sign that a lesion corresponds to this diagnosis. Unfortunately, however, these signs are frequently absent, or, when present, are often misinterpreted—as, for example, when a radiopaque mark or the gauze itself is assumed to be a surgical suture or a calcification. Radiologic findings, although very specific, are not pathognomonic, hence the possible confusion with abscesses, bronchiectasis, hydatid cysts, mycetomas, or neoplasms.

Given the progression evident from our patient’s x-rays, we considered a neoplastic etiology, which was why we decided to continue our study with PET. False positives arise because some inflammatory or infectious processes absorb fluorodeoxyglucose (FDG)—the most typically used PET tracer—at rates similar to those for uptake by tumoral tissues. PET is thus considered to have high sensitivity but relatively low specificity. In a recent meta-analysis, Gould et al reported a PET sensitivity of 96.8% and a specificity of 77.8% for malignant neoplasms. False negatives are typically associated with tumors of less than 1 cm and with low metabolic activity, such as carcinoid tumors and bronchioloalveolar carcinoma. The first description of a combined PET-CT imaging pattern for a gossypiboma was as a granuloma developing in response to an intraabdominal foreign body. Our findings from PET were of a mass with low central uptake in relation to the actual gauze; the combined PET-CT image revealed an internal radiopaque mark. The external capsule of the lesion had a high level of FDG activity secondary to the fibroblastic content. The fact that bleeding tumors or tumors with significant central necrosis could result in a similar pattern explains why these findings might produce a false positive in a combined PET-CT image of a neoplasm—as occurred with our patient. Our findings are very similar to those of Ghersin et al, except for the difference of an erroneous interpretation of the radiopaque mark as a calcification. Our case represents the first description of an intrathoracic gossypiboma that produced a false-positive PET image.

In conclusion, gossypibomas should be included in the differential diagnosis of intrathoracic masses with high peripheral FDG uptake and with low central uptake, particularly if the patient has previously undergone cardiothoracic surgery. The use of gauzes with radiopaque marks and the counting of gauzes before and after closing the cavity are essential measures for preventing gossypibomas.

REFERENCES