

CT features of intrathoracic gossypiboma (textiloma)

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ABSTRACT

Here, we present chest radiography and computed tomography (CT) findings for three cases of mediastinal and pleural gossypiboma. Radiological manifestations varied according to the locations and chronicities of the gauze sponges and the types of reactions that they caused. CT analysis readily diagnosed gossypibomas in the early postoperative period by showing well-defined mediastinal- or pleural-based masses with hyperdense rims and central air bubbles. However, one patient presented in the late postoperative period, and a CT scan revealed a well-defined, solid pleural mass that was devoid of air bubbles; a correct diagnosis could not be established and the patient had to be reoperated on. Radiologists should be aware of different manifestations of this rare condition in cases of prior thoracic surgery and persistent respiratory symptoms.

Key words: • foreign bodies • surgical sponge • complication • computed tomography, X-ray • thorax

Gossypiboma or textiloma is a non-absorbable surgical material with a cotton matrix around which a foreign body reaction occurs. Although this condition is generally reported after abdominal laparotomy, a gossypiboma can occur following any surgical procedure. However, it is a rare complication after thoracic surgery (1, 2). The aim of this report is to present chest radiography and computed tomography (CT) findings for three cases in which patients presented with gossypibomas after cardiothoracic surgery.

Case reports

Case 1

A 50-year-old female who had undergone coronary artery bypass grafting 15 days earlier was admitted to our hospital with fever and dyspnea. She received medical therapy for pneumonia, but her symptoms persisted. A contrast-enhanced chest CT examination revealed a 6x4x6-cm, hypodense mass with multiple air bubbles and a peripheral hyperdense rim on the left side of the anterior mediastinum, which was consistent with a gossypiboma (Fig. 1). The patient underwent a second operation, and a retained surgical gauze sponge was removed from the anterior mediastinum.

Case 2

A 64-year-old male who had undergone a right bilobectomy for a right lower lobe endobronchial lesion 30 days earlier underwent an unenhanced chest CT examination to evaluate a mass that was recognized on his control chest radiograph. A 7.5x6.5x4.5-cm, well-defined mass lesion with areas of low and high density, air bubbles and a hyperdense rim was observed extending from the apex to the tracheobronchial angle on the right side of the mediastinum (Fig. 2). The patient underwent a second operation, and a surgical gauze sponge was removed.

Case 3

A 49-year-old male was admitted to our hospital with complaints of coughing and chest pain. His medical history revealed a coronary artery bypass grafting five years earlier. Posteroanterior and left lateral chest radiographs showed a peripheral mass lesion with incomplete border sign in the left hemithorax (Fig. 3a). An unenhanced chest CT examination revealed a well-defined pleural mass lesion with an obtuse angle in the left lower hemithorax, accompanied by a small pleural effusion (Fig. 3b). There was a ground-glass opacity around the lesion at lung window settings (Fig. 3c). A thoracotomy was performed, and a retained surgical sponge with peripheral fibrotic tissue was removed from the pleural space of the left lower lobe.

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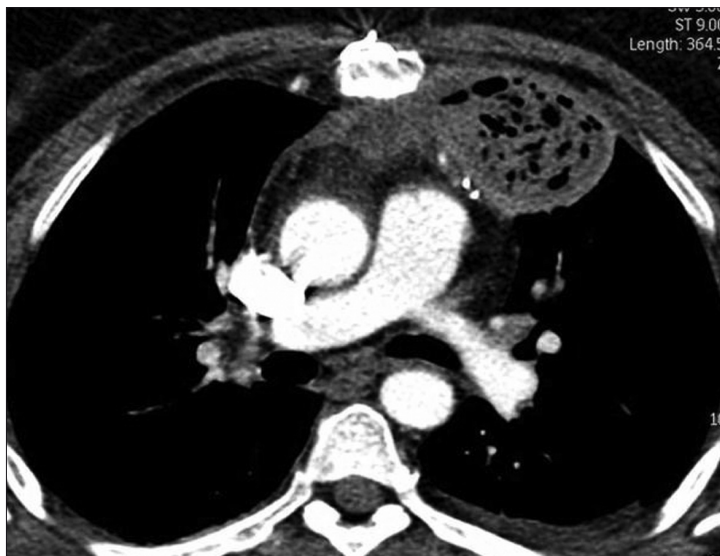


Figure 1. A 50-year-old female presenting with fever and dyspnea 15 days after coronary artery bypass grafting. A contrast-enhanced chest CT image using a mediastinal window setting shows a well-defined, hypodense mass harboring multiple air bubbles with peripheral enhancement on the left side of the anterior mediastinum.



Figure 2. A 64-year-old male who underwent a right bilobectomy 30 days earlier. A transverse unenhanced chest CT image demonstrates a well-defined mass containing air bubbles and a hyperdense rim on the right side of the mediastinum.

operative period, CT characteristically shows a well-defined mediastinal- or pleural-based soft tissue mass with a hyperdense rim, central air bubbles and a whirl-like pattern consisting of curvilinear, high-density stripes (1, 2, 5, 8). Peripheral rim enhancement is observed following the administration of contrast material. The spongiform appearance of a textiloma represents trapped air bubbles within the fibers of the gauze sponge in liquid media (5). Lamellar, high-density areas represent the sponge itself (1, 2, 5, 6). We observed similar findings in the first two cases, in which the elapsed times between the initial surgeries and the gossypiboma diagnoses were 15 and 30 days. Based on the typical imaging features and clinical histories, both masses were readily diagnosed by CT and confirmed by surgery. A differential diagnosis of gossypiboma in the early postoperative period includes hematoma and abscess (3, 9).

The air trapped by the foreign material is resorbed with time, and in the absence of a radiopaque marker, lesions appear as solid masses with or without whirl-like, high-density stripes in the late postoperative period. Differentiation from other masses, such as neoplasms or degenerated hydatid cysts, is difficult at this stage, even with the knowledge of the prior operation. In

Discussion

Gossypiboma is an unusual and important surgical complication with an estimated incidence of 1/1,000 to 1/10,000 surgeries (2, 3). It is a rare complication of thoracic surgery that can have severe medical consequences, including chronic pain, infection, and abscess formation (1, 3, 4). It commonly resides in the pleural space or mediastinum, and induces exudative or fibrotic reaction. Similar to two of our cases, a textiloma after cardiac surgery is usually seen on the left side of the hemithorax and is frequently observed in the pleural space (3, 5, 6).

Patients with textilomas can be either asymptomatic or can present with fever, cough, hemoptysis, weight loss (7, 8). With respect to symptoms, our

first case presented with high fever and dyspnea, the second case was asymptomatic, and the third case presented with coughing and chest pain.

A plain chest radiograph usually shows a peripheral or paramediastinal mass with an incomplete border sign, which suggests an extraparenchymal location. CT is the most effective and practical imaging method for diagnosing a gossypiboma, especially when a radiopaque marker is used (2, 5). In our cases, radiopaque markers were absent, and CT was required to further evaluate the masses.

The manifestations of textilomas on CT change according to the locations and chronicities of the gauze sponges and the types of reactions that they cause in the body. In the early post-

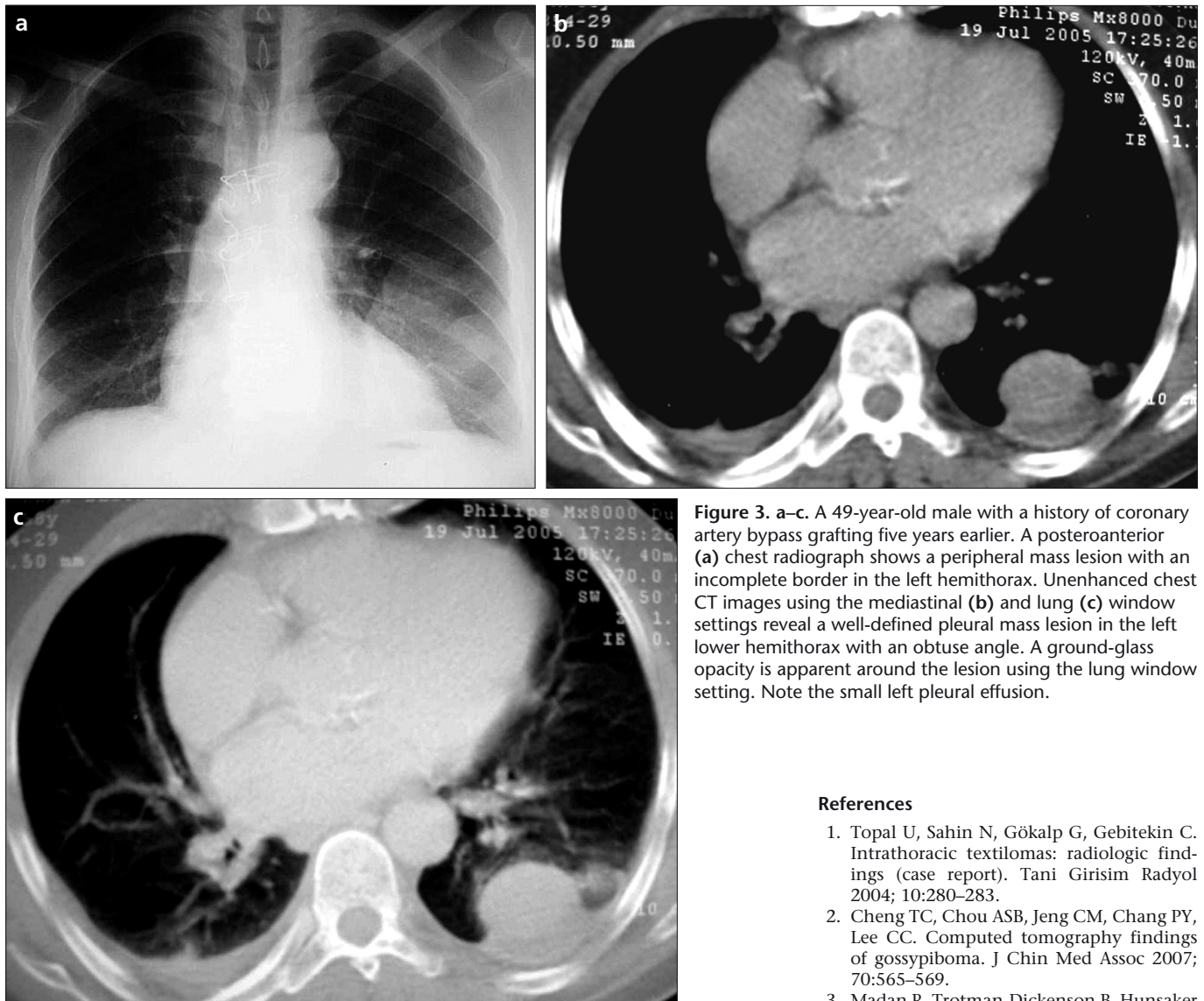


Figure 3. a-c. A 49-year-old male with a history of coronary artery bypass grafting five years earlier. A posteroanterior (a) chest radiograph shows a peripheral mass lesion with an incomplete border in the left hemithorax. Unenhanced chest CT images using the mediastinal (b) and lung (c) window settings reveal a well-defined pleural mass lesion in the left lower hemithorax with an obtuse angle. A ground-glass opacity is apparent around the lesion using the lung window setting. Note the small left pleural effusion.

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the third case presented here, a well-defined, pleural-based solid mass that was devoid of air bubbles was observed with an accompanying small pleural effusion. Because the CT features were nonspecific, a preoperative diagnosis could not be established. The demonstration of cotton fibers in samples obtained via transthoracic needle biopsies has been previously reported in gossypibomas (1). However, a transthoracic needle biopsy was not performed in the third case, and the diagnosis was only established by surgery.

In conclusion, gossypiboma is rarely seen following thoracic surgery, and patients are usually asymptomatic for a long period after the initial operation. The diagnosis of intrathoracic gossypiboma can be easily missed because of its rare occurrence and low index of

suspicion. Radiological manifestations of textilomas change according to the locations and chronicities of the gauze sponges and the types of reactions that they cause in the body. CT is the most effective and practical diagnostic method in the diagnosis and characteristically shows well-defined mediastinal- or pleural-based masses with a hyperdense rim, central air bubbles, and a whirl-like pattern consisting of curvilinear, high-density stripes in the early postoperative period. However, because trapped air is resorbed with time, lesions cannot be differentiated from other solid masses in the late postoperative period. An awareness of this condition in individuals with prior thoracic surgery and persistent respiratory symptoms should alert the radiologist for correct diagnosis.