

A Rare Condition Mimicking a Mediastinal Tumor: Gossypiboma

Mediasten Tümörünü Taklit Eden Nadir Bir Durum: Gossipiboma

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Abstract

The mediastinum is the region within the thoracic cavity that contains the heart, great vessels, esophagus, trachea, thymus, lymph nodes and neural structures. The mediastinum is divided into three sections: anterior, middle and posterior. The presence of so many different tissues in this area makes it prone to the development of many different types and numbers of malignant/benign tumors. Materials left behind during surgical operations can mimic mediastinal tumors in all three compartments of the mediastinum. Gossypiboma or textileoma are the terms used for granulomatous inflammations caused by surgical gas packs or foreign bodies left in the body after surgery. The present study relates to a case of gossypiboma originating from the paravertebral sulci and extending into the visceral mediastinum, mimicking a mediastinal tumor, in the light of current literature.

Keywords: Foreign body, complications, thorax, mediastinum.

Öz

Mediasten, toraks boşluğu içinde önde sternum, arkada vertebralalar, yanlarda akciğerler ile sınırlanmış, içinde kalp, büyük damarlar, özofagus, trakea, timus, mediastinal lenf nodları ve nöral yapılarının yer aldığı bölgeye verilen addır. Bu alanda birçok farklı doku bulunduğu için çok farklı tipte ve sayıda malign/benign tümörler görülebilir. Cerrahi operasyonlar sonrası unutulmuş materyaller mediasten her üç kompartımanından gelişebilecek mediastinal tümörleri taklit edebilirler. Gossipiboma veya tekstiloma ameliyattan sonra vücutta kalan cerrahi gaz tampon ya da kompreslerin oluşturduğu granülomatöz inflamasyon olarak tanımlanır. Bizim olgumuzda posterior mediastenden köken alarak orta mediastene uzanım gösteren, mediasten tümörünü taklit eden gossipibomayı güncel literatür bilgisi eşliğinde irdeledik.

Anahtar Sözcükler: Yabancı cisim, komplikasyonlar, toraks, mediasten.

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The mediastinum is the region within the thoracic cavity that is bordered by the sternum anteriorly, the vertebrae posteriorly and the lungs on either side, and contains the heart, great vessels, esophagus, trachea, thymus, mediastinal lymph nodes and neural structures. The mediastinum is divided into three sections: anterior, visceral (middle) and paravertebral sulci bilaterally. Benign or malignant tumors can be detected in these three compartments, depending on the characteristics of the anatomical structures (1,2). Materials left in the cavity after surgical operations can mimic mediastinal tumors in all three compartments of the mediastinum.

The term gossypiboma (and textileoma) refers to granulomatous inflammations that develop as a result of surgical gas packs or foreign bodies being left in the body after surgery, which can occur even with the close attention of the surgical teams. The term derives from the Latin gossypium (cotton) and the Swahili boma (hide place) (3). Gossypiboma (GB) is a rare and preventable complication that may lead to medicolegal problems, and while it is usually seen after abdominal surgery, it can less frequently be seen after thoracic surgery. GB should be considered in the differential diagnosis when an intrathoracic mass is detected in patients who have previously undergone thoracotomy for any reason (4). It is clinically evaluated as a mass in cases where gauze without radiopaque labeling is forgotten. This study reports retrospectively on a case of gossypiboma that mimicked a paravertebral sulci tumor after coronary bypass surgery in the light of current literature.



Figure 1: Posterolateral chest radiograph of the patient before the operation. The trachea is observed in the midline on the graph, as well as a mass lesion behind the heart contour in the left lower lobe and metallic sutures from a previous sternotomy

CASE

A 63-year-old male patient treated for respiratory failure in the intensive care unit was directed to the thoracic surgery clinic after a mass was observed on chest X-ray. It was learned from his history that he had undergone coronary bypass surgery with a median sternotomy incision 8 years earlier and had undergone various medical treatments for chest pain, arrhythmia and heart failure. A paracardial localized mass opacity was identified in the lower zone of the left hemithorax on PA radiograph (Figure 1), while Thorax Computed Tomography (CT) revealed a 6x8 cm giant mass lesion originating from the paravertebral sulci and extending to the visceral mediastinum, containing calcifications and cystic areas, and causing compression on the heart in the left hemithorax lower zone (Figure 2). A Positron Emission Tomography (PET) requested for systemic screening revealed no pathological findings other than involvement of the mediastinal lesion with a SUVmax of 1.7. The patient was subsequently scheduled for explorative thoracotomy.

A muscle-sparing left lateral thoracotomy incision was made to allow entry to the thorax through the sixth intercostal space. A giant mass lesion was encountered as soon as the thoracic cavity was entered that seemed to have invaded the surrounding soft tissues and pericardium. The lungs and diaphragm were preserved. While attempting to separate the lesion with blunt and sharp dissections, purulent drainage was observed inside the lesion and an abdominal gas pack was detected in the lesion while it was being aspirated and removed (Figure 3). After irrigation of the thorax with povidone iodide, a thoracic drain was placed, and the operation was terminated.

The drain was terminated on the second postoperative day as no postoperative complications developed and no drainage or leakage. Since there was no growth in the microbiology culture, the patient was discharged on the third postoperative day with a prescription of broad-spectrum antibiotics.

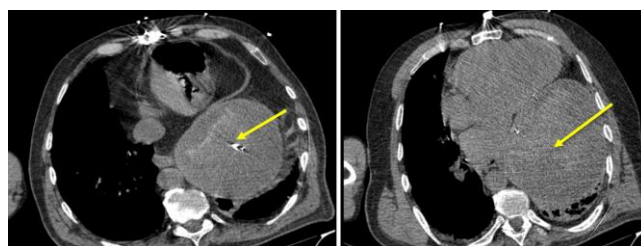


Figure 2: CT image of the patient before the operation. A mass lesion with calcification inside the left lower lobe pressing from the paravertebral sulci can be seen (yellow arrow), giving the image of an abscess, and with a semisolid appearance in places

DISCUSSION

In mediastinal pathologies, the mediastinum is generally divided into three parts, namely the anterior (superior + anterior mediastinum), visceral (middle) and paravertebral sulci. The anterior compartment is bounded anteriorly by the undersurface of the sternum, inferior to the innominate vessels and posteriorly by an imaginary line formed by the anterior surfaces of the great vessels and pericardium. The visceral compartment (referred to also as the postvascular space, the middle mediastinum or the central space) extends from the posterior surface of the superior portion of the sternum above the innominate vessels, and from the posterior limit of the anterior compartment below these vessels to the ventral surface of the vertebral column. The paravertebral sulci (costovertebral regions) as noted, are not truly mediastinal in location but are rather potential spaces along each side of the vertebral column and adjacent proximal portions of the ribs. The anterior mediastinum contains the thymus, lymph nodes and fatty tissue, while the visceral mediastinum contains the heart and great vessels, trachea, main bronchi, esophagus, vagus and phrenic nerves, the thoracic duct and lymph nodes. Finally, the paravertebral sulci contains the sympathetic chain, intercostal nerves and spinal nerve roots (1).

Mediastinal tumors generally originate from their own tissue; anterior mediastinal tumors commonly differentiate from thymus, germ cells, thyroid, parathyroid and lymphatic tissue; visceral mediastinal tumors differentiate from lymph nodes, esophagus and cysts; and paravertebral sulci tumors most commonly originate from neurological tissues. Mediastinal diseases are summarized in table 1 (1).

GB is the general name given to foreign bodies that are left behind after surgery in any part of the body that leads to the appearance of masses, with the most common culprit being surgical pads. Although GB is frequently reported in abdominal cavities in literature, it has also been reported in the nose, breast, pancreas, pararenal region, tracheobronchial tree, vagina, spine, femur, neck and prostate. In a recently reported case in national literature, GB developed after a paravertebral abscess operation (4-6).

The patient had undergone coronary bypass surgery 8 years earlier and his chronic complaints did not regress despite various medical treatments. Upon the detection of a lesion in the lower left region during radiological imaging in the intensive care unit in which the patient was hospitalized, different possible pre-diagnosis began to be considered.

Paravertebral sulci tumors can be divided into four groups: neurogenic tumors; tumors originating from spinal nerves; cysts; and others. Paravertebral sulci tumors

account for 20% of all mediastinal tumors, and 75% of paravertebral sulci tumors are neurogenic, most commonly originating in the intercostal nerves or in the sympathetic chain regions. They are usually asymptomatic and may present with nonspecific weight loss, weakness and back pain (1). In our case, the patient's advanced age and arrhythmia were not an expected situation.

In the differential diagnosis, mature teratoma was first considered due to the presence of calcification identified on PET/CT and CT images and its mediastinal origin, however the advanced age of the patient and the low SUVmax value on PET/CT excluded the possibility of teratoma.

Thorax CT and FDG PET/CT imaging methods can be used in differential diagnosis, and FDG PET/CT positivity in particular can be useful in confirming the possibility of malignancy. Diagnostic procedures such as transthoracic needle aspiration biopsy, thoracentesis and pericardiocentesis can be performed under the guidance of fiberoptic bronchoscopy or ultrasonography. Sonographically, masses with an echogenic center and a hypoechoic margin have been defined as a typical finding for GB (7,8).

Many differential diagnoses can come to mind in a patient with a history of coronary bypass surgery who presents with dyspnea and chest pain, as such symptoms can be associated with angina pectoris, phrenic nerve palsy, pleural-pericardial effusion and heart failure. The presence of a lesion in the lower left region of the chest X-ray, however, points rather to a lung tumor, mediastinal tumor, lung abscess, lobar pneumonia, solitary fibrous tumor or pulmonary hydatid cyst. In cases of malignancy, additional symptoms such as weight loss, hemoptysis, cough and anorexia may accompany, while in cases where infection is suspected, fever, leukocytosis and other septic findings may be added to the picture. A much rarer cause of chest pain and shortness of breath is foreign bodies forgotten in the thoracic cavity during previous operations. Aside from all the mentioned differential diagnoses, further radiological and laboratory investigations may be required to reach a definitive diagnosis.

Tumor markers released as a result of the biological activity of masses are molecules in the blood or tissue that provide information pointing to the diagnosis or course of the mass. These may take the form of hormones, enzymes, intracellular proteins or cell membrane antigens, and can be detected in serum, plasma, urine or other body fluids. Tumor markers have various characteristics that can aid in the distinction of malignant tissue from normal tissue or one malignancy from another, that can determine response to treatment, or that can show different behavioral patterns within a tumor type. They may, however, not be sufficient to make a diagnosis in every case (9-11).

Table 1: Tumor localizations by mediastinal segments

Localization	Origin	Disease
Anterior mediastinum	Thymus	Thymoma, thymic carcinoma, thymic carcinoid, thymolipoma, thymic cyst, thymic hyperplasia
	Lymph	Hodgkin lymphoma, Non-Hodgkin lymphoma
	Germ cell	Teratoma, seminoma, nonseminomatous GCT
	Thyroid	Goiter
	Parathyroid	Parathyroid adenoma
	Pericard	Pericardial cyst
	Others	Mesenchymal tumors (lipoma, liposarcoma, angiosarcoma, leiomyoma), cystic hygroma
Middle mediastinum	Lymph node enlargement	Lymphoma, benign lap, infectious and non-infectious granulomatous diseases, Castleman disease, amyloidosis, metastatic lap, lung, renal cell, gastrointestinal cancer and breast tumors and malignant melanoma
	Cysts	Bronchogenic cyst, enteric cysts
	Esophageal diseases	Achalasia, diverticulum, benign and malignant esophageal tumors
	Vascular lesions	Aneurysms, hemangioma
	Others	Morgagni hernia
	Tuberculous pleural effusion	Lymphoma, benign lap, infectious and non-infectious granulomatous diseases, Castleman disease, amyloidosis, metastatic lap, lung, renal cell, gastrointestinal cancer and breast tumors and malignant melanoma
Posterior mediastinum	Neurogenic tumors	Schwannoma, neurofibroma, malignant peripheral nerve tumor, ganglioneuroma, ganglioneuroblastoma, neuroblastoma, pheochromocytoma, paraganglioma
	Spinal	Meningocele, paraspinal abscess (pott's abscess)
	Cysts	Enteric cysts
	Others	Extramedullary hematopoiesis, ductus thoracic cysts, hiatus hernia

Increases in AFP and B-HCG are important especially in anterior mediastinal tumors, and it should be kept in mind that an increase in B-HCG in male patients is a pathological condition. An increase in chromogranin and NSE can be expected in paravertebral sulci tumors, while increased urinary catecholamines may be found in paravertebral sulci tumors (10-12). In the presented case, B-HCG and AFP were reported as negative.

In cases of acute inflammation, increased leukocytes, sedimentation and CRP may be observed, although in our case the inflammatory mediators were also reported as negative. When evaluated together with tomography findings, a lesion may have the appearance of a mature cystic teratoma, a mediastinal tumor such as a neurogenic mediastinal tumor, a solitary fibrous tumor or a complicated hydatid cyst. The origin of the lesion in the mediastinum, the calcified areas and the semi-solid-cystic density made the diagnosis different from lung tumor. FDG PET/CT was not considered due to the low malignant potential of the lesion. Explorative surgical procedures can be considered a good alternative approach to the establishment of diagnosis from among all the aforementioned preliminary diagnoses and to steer surgical curative treatment. A surgical approach can be considered with a classic posterolateral thoracotomy, or alternatively, a median sternotomy or Video Assisted Thoracic

Surgery (VATS) can be performed. However, considering the size of the lesion and the difficulty of manipulation, open procedures were found to be more appropriate for the present case, and exploration with a muscle-sparing left lateral thoracotomy incision was preferred.

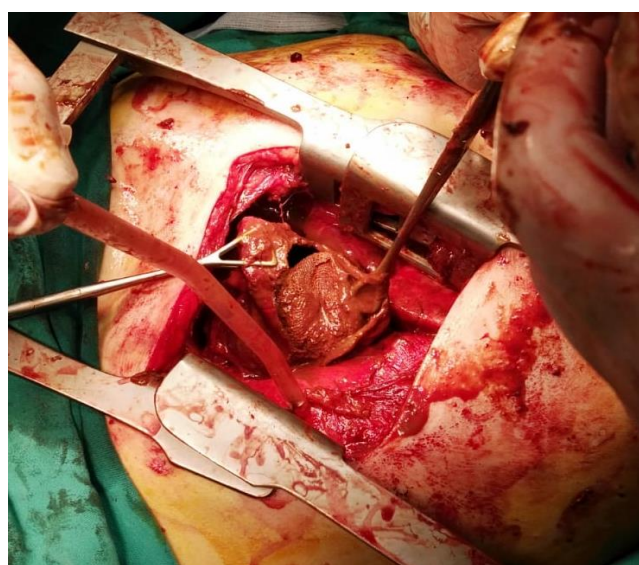


Figure 3: Perioperative view of the case. GB coming out of the mass appears

CONCLUSION

Gossypiboma can be detected in all compartments of the mediastinum, and can mimic a mediastinal tumor. A differential diagnosis between mediastinal lesions and GB can be made with the help of various clinical, radiological and laboratory tests. This rare condition should be kept in mind when evaluating lesions originating in the mediastinum.

CONFLICTS OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

Concept - O.E.E., F.Y., Y.A.K., Y.Y.; Planning and Design - O.E.E., F.Y., Y.A.K., Y.Y.; Supervision - O.E.E., F.Y., Y.A.K., Y.Y.; Funding -O.E.E.; Materials -O.E.E.; Data Collection and/or Processing - O.E.E.; Analysis and/or Interpretation - O.E.E.; Literature Review - O.E.E.; Writing - O.E.E.; Critical Review - O.E.E.

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