

Fat-Containing Lesions of the Mediastinum

Mediastinel Yağ İçeren Lezyonlar

Background

Computed tomography (CT) is the most used radiological technique for detecting chest. Mediastinal soft tissues have a nonspecific appearance at imaging. By correlating lesion location with fat characteristics, it is easier making differential diagnosis. Mediastinal fat-containing lesions include germ cell neoplasms (teratoma), thymolipoma, lipoma, liposarcoma, rebound thymic hyperplasia, pericardial fat necrosis, extramedullary hematopoiesis (1).

We retrospectively evaluated chest radiography and CT images of fat-containing lesions located in the mediastinum, between 2008 and 2014 in our institution. Ten patients (seven males, three females) aged 20-64 years (mean age, 38.7 years) were included in this study. We identified two thymolipomas, a pericardial fat pad, a teratoma, an extramedullary hematopoiesis, a pericardial fat necrosis, two rebound thymic hyperplasias, a liposarcoma, a hiatal hernia. Most of these lesions were histologically diagnosed or followed-up. Examinations were performed by a 16-slice CT.

Öz

Bilgisayarlı tomografi (BT) göğsü değerlendirmede en sık kullanılan radyolojik tetkiktir. Mediastinal yumuşak dokuların görüntülemeye özgün olmayan görünimleri mevcuttur. Lezyonun lokalizasyonunu ve yağ içeriğini ilişkilendirmek ayırıcı tanı yapmayı kolaylaştırmaktadır. Mediastinal yağ içeren lezyonlar germ hücreli tümörler (teratom), timolipom, lipom, liposarkom, rebound timik hiperplazi, perikardiyal yağ nekrozu, ekstrapedüller hematopoezi kapsar (1).

2004-2018 yılları arasında merkezimizde çekilen akciğer filmi ve BT imajları geriye dönük değerlendirildi. On hasta (7 erkek, 3 kadın) çalışmaya dahil edildi. İki timolipom, bir perikardiyal yağ yastıkçığı, bir teratom, bir ekstrapedüller hematopoez, bir perikardiyal yağ nekrozu, iki rebound timik hiperplazi, bir liposarkom, bir hiatal herni tespit edildi. Çoğu lezyon histolojik olarak ya da takip ile tanı aldı. Tetkikler 16 kesitli BT ile gerçekleştirildi.

Findings and procedure details

Thymolipoma

Thymolipoma is a rare, benign, slow-growing tumors of anterior mediastinum, containing both thymic and mature adipose tissue. Thymolipoma accounts for 2-9 % of thymic

Elçin AYDIN¹
Selen BAYRAKTAROĞLU²
Naim CEYLAN²
Cihan ALTIN¹
Recep SAVAŞ²

¹Baskent University Zubeyde Hanım, Practice and Research Center, Department of Radiology

²Ege University, Department of Radiology, Ege University

Yazışma Adresleri /Address for Correspondence:

Elçin AYDIN
Baskent University Zubeyde Hanım, Practice and Research Center, Department of Radiology, 6371 Sk. No:34 Bostanlı/Karsiyaka, Izmir,

Tel/phone: +90 232 3305230

E-mail:elcinaydin09@yahoo.com.tr

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Anahtar Kelimeler:

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neoplasms. It is mostly seen in young patients with large size. The most common localization is the anterior mediastinum and it can simulate cardiomegaly. Most patients are asymptomatic, with the lesion detected incidentally. Symptoms may occur as the tumor grows in size. At CT, thymolipomas appear fatty tissue mixed with soft tissue attenuation that represent thymic tissue with sharp border, well-defined capsule and no invasion of surrounding structures (1,2). CT findings have an important role in the diagnosis of thymolipomas (1-3). The thymolipoma in CT seems a large mixed fat and soft tissue density mass adjacent to the mediastinum and conform to the shape of adjacent mediastinal structures and it is connected to thymus (Fig. 1, Fig. 2). And also MRI can be helpful for the diagnosis (Fig.3).

Mediastinal Lipoma

Lipomas are well-circumscribed, anterior mediastinal tumors that originate from adipose tissue. Lipomas are reported



Fig. 1: CT findings demonstrate a large mixed fat and soft tissue density mass adjacent to the mediastinum and conform to the shape of adjacent mediastinal structures and it is connected to thymus.

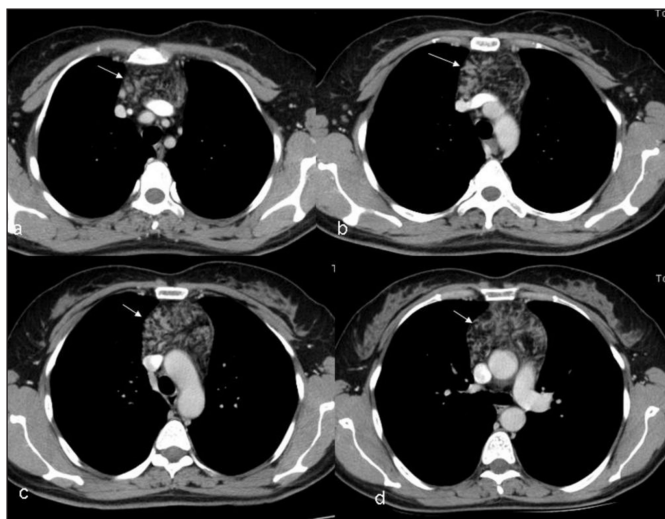


Fig. 2: CT findings of a 34-year-old female patient show a thymolipoma typically located in anterior mediastinum.

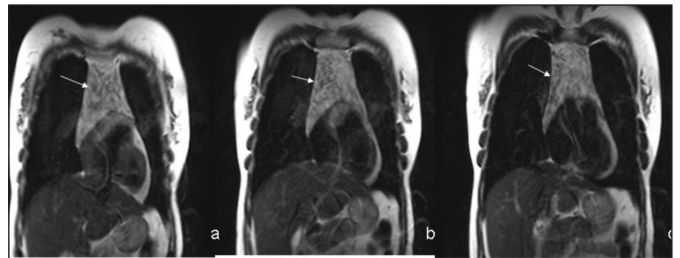


Fig. 3: T1-weighted coronal MRI of a 34-year-old female patient (the same patient in Figure 2) shows a hyperintense mass when compared to muscle (fat containing mass).

to represent 1.6%-2.3 % of all primary mediastinal tumors. The most common localization for lipomas are cardiophrenic angle and cervicomedial. At CT lipomas occur homogeneous fat attenuation with well-defined border (1,2) (Fig.4).



Fig. 4: Posteroanterior chest radiograph (a) of a 58-year-old female patient shows opacity near the heart with low density (arrow). CT (b,c) scan shows a large, well-demarcated fatty mass

Mediastinal Liposarcoma

Mediastinal liposarcoma is seen extremely rare but when it occurs prognosis is poor. Mediastinal liposarcoma may infiltrate the heart, early metastasis to the lungs and frequent local recurrence after surgical resection. The presenting symptoms are related to size and direct invasion of pericardium or superior vena cava (3-6). Dyspnea, vague chest dis-

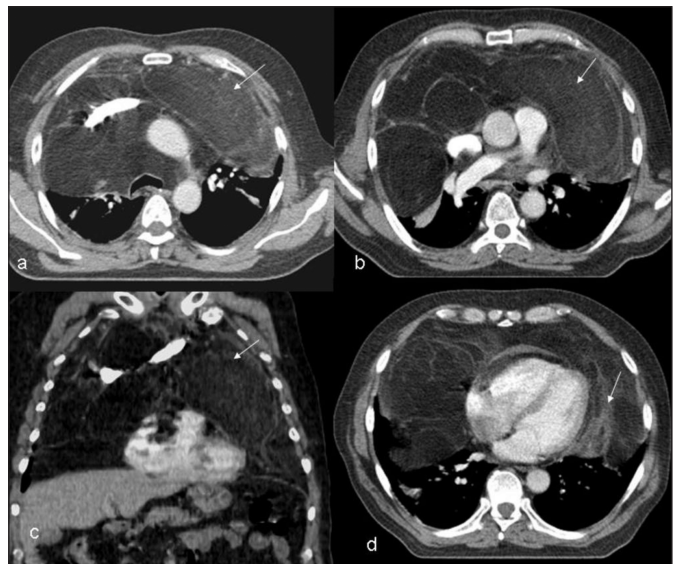


Fig. 5: CT scan (axial a,b,d) and coronal (c) of a 44-year-old male patient shows a large, well-demarcated, inhomogeneous fatty mass with invasive features to the heart and vessels.

comfort, cough, or constitutional symptoms can be seen. On conventional chest radiography widened mediastinum and deviation of the trachea and vessels may be apparent. The mediastinal liposarcomas seems inhomogeneous, large fatty masses with soft tissue and fibrous bands on CT (3-6) (Fig.5)

Teratoma

Teratomas originate from germ cells which contains one or more well-differentiated tissues from the ectoderm, mesoderm, or endoderm. They are mostly seen in the anterior mediastinum and young patients. The most common histologic type of mediastinal germ cell tumor is mature teratoma. The patients are mostly asymptomatic due to slow growing of the tumor. At CT, teratomas have a well-defined margin and soft tissue, fluid, fat, and calcium attenuation. (Fig.6, Fig.7). The teeth visualization and the presence of a fat-fluid level is specific for teratoma. Teratoma with malign transformation must be ruled out if a non-homogeneous cystic mass with a fat or oil component and thick wall with calcification with invasion of the pericardium and great vessels (7-9).

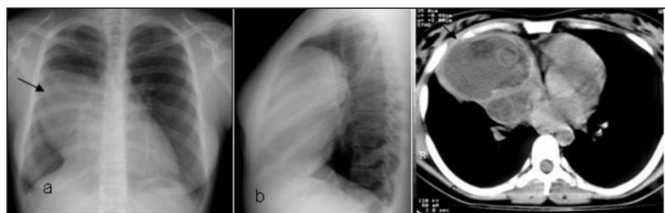


Fig. 6: Posteroanterior (a) and lateral chest radiograph (b) of a 34-year-old male patient shows a large, smooth edged opacity, giving silhouette right heart border (arrow). CT (c) scan shows a large, heterogeneous fatty mass

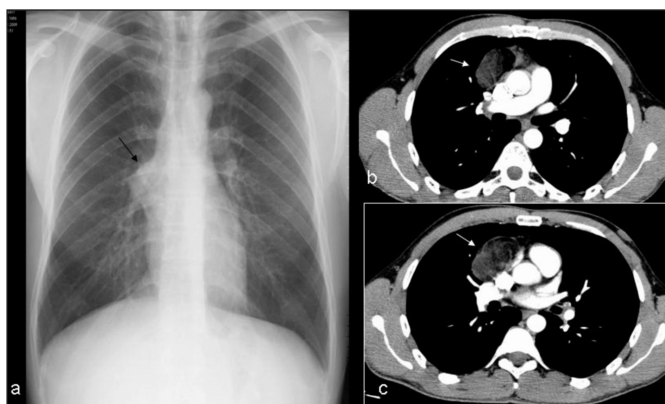


Fig. 7: Posteroanterior chest radiograph (a) of a 37-year-old male patient reveals a smooth edged opacity, giving silhouette right hilum border. Axial CT (b,c) scan shows a non-homogeneous, well-marginated fat attenuation mass with soft-tissue components

Extramedullary Hematopoiesis

Extramedullary hematopoiesis (EMH) is a rare disease associated with hematologic disorders and mostly occurred in the posterior mediastinum. EMH is a compensation mechanism for bone marrow dysfunction. It is related with neoplastic process or hematopoietic system disease especially thalassemia, hereditary spherocytosis and sickle cell anemia (10,11). EMH often occurs in the spleen, liver or adrenal gland when it is seen in the posterior mediastinum neurogenic tumor of the posterior mediastinum can be interfered with it (12). Most of the patients with EMH in the posterior mediastinum are asymptomatic and found incidentally. However in rare cases EMH may cause neurologic symptoms due to spinal cord compression, pleural effusion, hemothorax and chylothorax (12). Radiologic examination is useful for the diagnosis. The chest X-ray and CT scan reveals smooth lobulated masses located at the posterior mediastinum. On CT scanning, EMH appears as well circumscribed paravertebral mass that contains adipose tissue and homogeneous enhancement but no bony erosion (10-14) (Fig.8).

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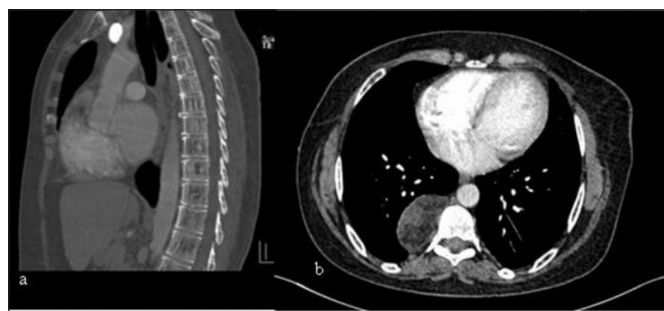


Fig. 8: CT findings demonstrate well circumscribed, paravertebral thoracic mass, containing fat

Mediastinal Fat Necrosis

Mediastinal fat necrosis is a rare self-limiting cause of chest pain. CT findings include a fat attenuation lesion with intrinsic and surrounding increased attenuation stranding. Mediastinal fat necrosis occurs within the mediastinum outside the pericardium. The characteristic finding for mediastinal fat necrosis is an ovoid mediastinal fatty lesion with a soft tissue rim and intrinsic surrounding soft tissue stranding (1,15) (Fig.9).

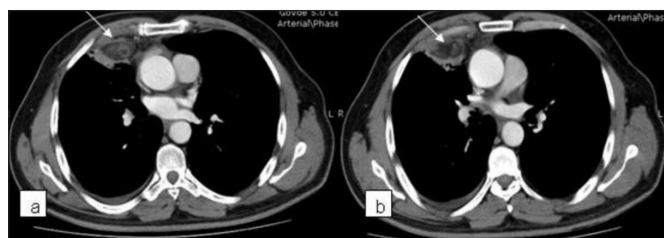


Fig. 9: Axial contrast-enhanced chest CT shows an anterior mediastinal ovoid fat attenuation lesion (arrows) with intrinsic and surrounding soft tissue attenuation stranding.

Rebound Thymic Hyperplasia

In some patients who have undergone chemotherapy for malignant tumors, new masses occur in the anterior mediastinum which can either spontaneously regress or persist

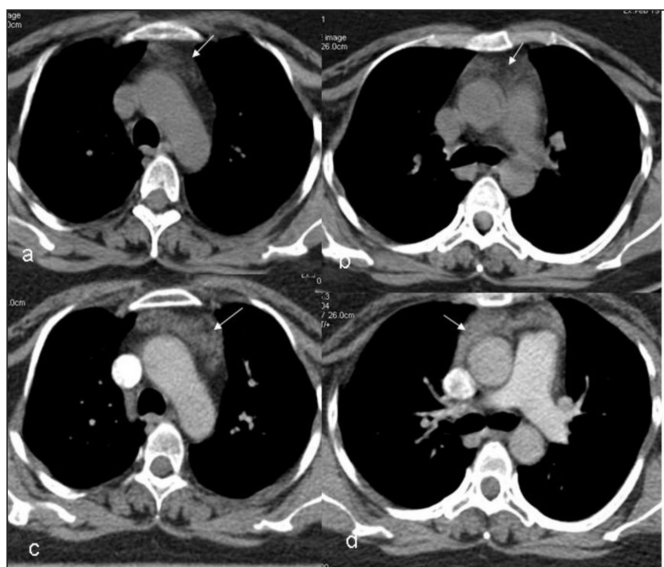


Fig. 10: Axial CT of 30-year-old male patient before chemotherapy, no thymic remnant seen in widened fat-filled mediastinum (a,b). 3 months after chemotherapy CT shows anterior mediastinal fat attenuation lesion and the typical thymic appearance

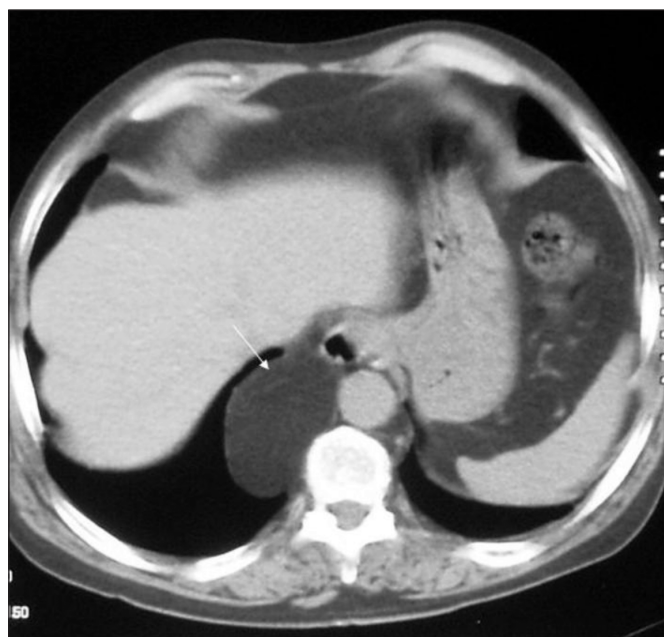


Fig. 11: Axial chest CT shows of a 60-year-old female patient shows severe widening of the esophageal hiatus, with cephalic herniation the abdominal fat.

for along time. CT scans show a mass that overlapped with the thymus (Fig.10, Fig. 11). It is important to know that when mediastinal widening occurs in patients with cancer treatment, can be related to rebound thymic hyperplasia (7,16).

Conclusion

We presented 11 rare and exemplary mediastinal fat containing lesions with their appearances on X-ray, CT and MRI. The presence and pattern of fat attenuation on CT and MRI will allow us to narrow the differential diagnosis of these lesions.

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