

## Case Report



www.firattipdergisi.com

# Immature Mediastinal Teratoma: Radiological Findings (A Case Report)

Ayşe Murat AYDIN, Mustafa KOÇ<sup>a</sup>, A.Kursad POYRAZ

Fırat Üniversitesi Tıp Fakültesi Radyoloji Anabilim Dalı, ELAZIĞ

### ABSTRACT

Immature mediastinal teratomas are rare malignant neoplasms that can metastasize and recur, are characterized by the presence of various tissues that histologically resemble embryonal structures. Computerized tomography (CT) shows the location and extent of the tumors as well as intrinsic elements including soft tissue, fat, fluid, and calcification. CT is the radiological modality choice for the diagnostic evaluation of these tumors and also combination of magnetic resonance imaging (MRI) best defines the characterisation, location and operability of tumor. In this report, we present radiological findings of immature mediastinal teratoma. ©2008, Fırat Üniversitesi, Tıp Fakültesi

**Key words:** Mediastinum, Immature teratoma, Computerized tomography, Magnetic resonance imaging

### ÖZET

#### İmmatür Mediastinal Teratom: Radyolojik Bulgular (Olgu Sunumu)

İmmatür mediastinal teratom, metastaz ve rekürrens bulguları gösterebilen, nadir, malign bir neoplazm olup, histolojik olarak embriyonel dokulardan oluşan farklı bir yapıya sahiptir. Bilgisayarlı tomografi (BT) tümörün yerini, yayılımını, ayrıca içerdiği kalsifikasyon, sıvı, yağ dokusu ve yumuşak doku kısımlarını gösterir. BT tanı için seçilecek ilk radyolojik modalite olmakla birlikte, manyetik rezonans görüntüleme (MRG) ile birlikte değerlendirme; karakterizasyon, lokalizasyon ve operasyon kriterlerini belirleme açısından oldukça değerlidir. Biz bu yazıda immatür mediastinal teratomun radyolojik bulgularını sunduk. ©2008, Fırat Üniversitesi, Tıp Fakültesi

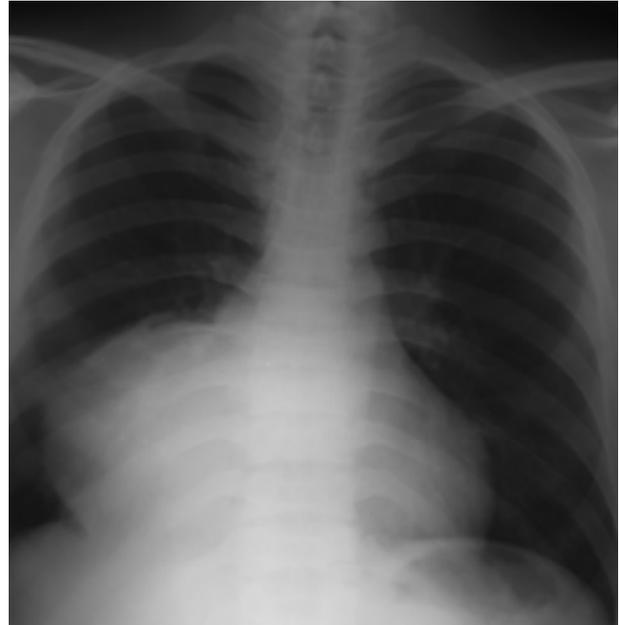
**Anahtar kelimeler:** Mediasten, İmmatür teratom, Bilgisayarlı tomografi, Manyetik rezonans görüntüleme

Mature and immature teratomas are the basic pathologic types of teratomas, which mostly occur in the mediastinum and pericardium. Mediastinal teratomas have been classified as mature when there is histologically well differentiated tissue and as immature when they contain so-called immature epithelial and mesenchymal elements as well as mature tissue (especially tissues of neuroepithelia) (1,2).

Immature mediastinal teratomas are rare, found in only 1% of all mediastinal teratomas (3). Immature mediastinal teratomas can metastasize and recur and are characterized by the presence of various tissues that histologically resemble embryonal structures (3,4). In the literature there is no detail about radiological images of this lesion enough. The combination of CT and MRI best defines the location and operability of tumor. In this report, we describe radiological findings of a rare case of immature mediastinal teratoma arising from the right anterior mediastinum.

### CASE REPORT

A 26-year-old male patient was admitted to our hospital with complaints of cough and dyspnea for 4 months. He was also complaining from sputum production, hemoptysis and right chest pain for 20 days. Night fever and perspiration was accompanying symptoms.



**Figure 1.** Posteroanterior chest radiograph shows a large, well-marginated mass of the anterior mediastinum extending to the right hemithorax.

<sup>a</sup> Corresponding Address: Dr. Mustafa Koç Fırat Üniversitesi Tıp Fakültesi, Radyoloji Anabilim Dalı, ELAZIĞ

EY. Tel: +90 424 2333555

Faks: +90 424 2376773

e-mail: mkoc@firat.edu.tr

Physical examination revealed decreased breath sounds in lower zone of right lung. Routine laboratory tests was within normal limit. Posteroanterior chest radiograph revealed a large, smooth edged opacity between right pulmonary hilus and right diaphragm. Opacity was blurring the contours of diaphragm and heart (Figure 1).

Contrast-enhanced chest CT showed a smooth-lobulated edged mass with heterogenous density composed of solid and cystic components (density values mostly ranged from -80 to -110 HU at the more hypodense area and 10 HU at the cystic region), which located between anterior mediastinum and right pleura and right diaphragm. Mass were also containing small punctate calcifications (density value was approximately 300 HU) and extending to anterior chest wall (Figure 2).

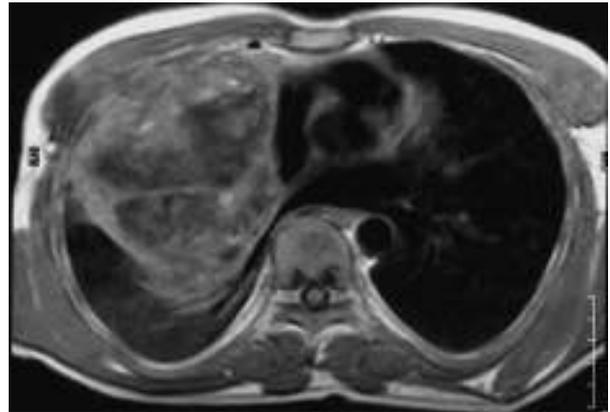


**Figure 2.** Contrast-enhanced chest CT shows a large, smooth-lobulated edged mass with heterogenous density composed of solid and cystic components. Note also the small punctate calcifications (arrow).

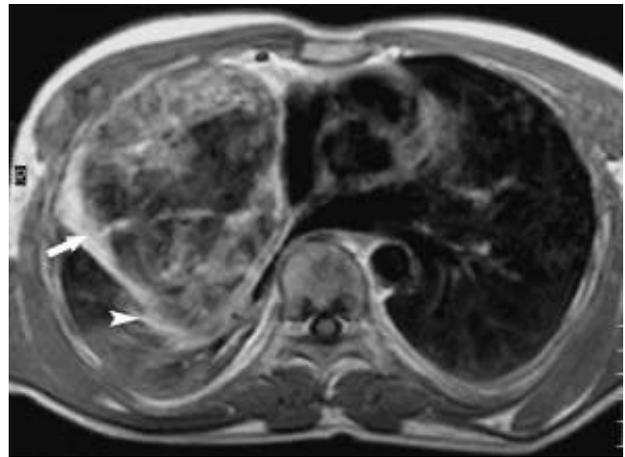
The mass was obliterating perivascular and pericardial fat planes. Right lung's volume was decreased. Anterior segment of upper lobe, middle lobe and mediobasal segment of lower lobe of right lung parenchyme was obliterated.

Chest MRI showed a mass which located within anterior mediastinum and right hemithorax with dimensions of 10x12x10 cm. Mass was smooth-lobulated edged with heterogenous intensity on both T1 and T2 weighted images and also some areas with high signal intensity on T1 weighted images which demonstrate fat within the mass. Post-contrast T1 weighted images showed, mass have enhanced capsule and solid components. Mediastinal and chest wall fat planes were obliterated. There was an irregularity at the posterior contour of the mass and strong enhancement at the adjacent lung parenchyme due to inflammation (Figure 3a-d).

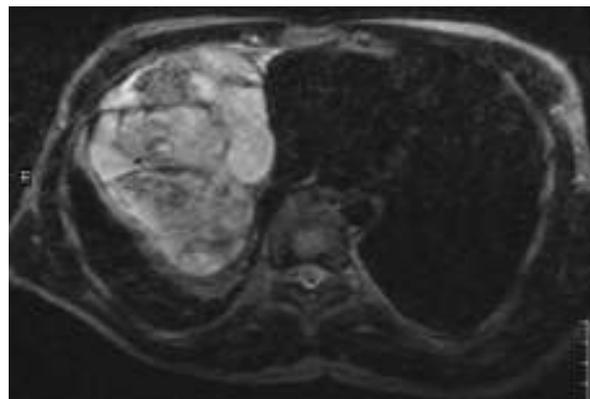
At operation, a median sternotomy was used to approach mass, which was totally removed. Histopathology proved it to be an immature teratoma.



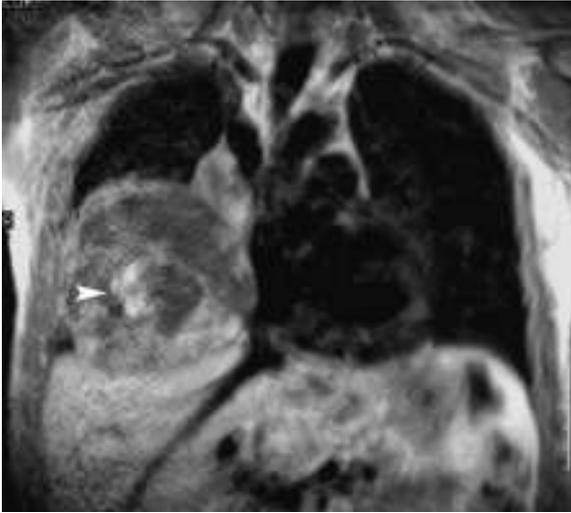
**Figure 3. a.** Axial T1 weighted MRI demonstrates an inhomogeneous, smooth-lobulated edged mass with mediastinal fat obliteration



**Figure 3 b.** Post-contrast axial T1 weighted MRI shows mass with enhanced capsule and solid components (arrow), additionally, there is an irregularity at the posterior contour of the mass and strong enhancement at the adjacent lung parenchyme due to inflammation (arrowhead)



**Figure 3 c.** Axial T2 weighted MRI shows a heterogeneous mass with solid (low signal) and cystic (high signal) components.



**Figure 3 d.** Coronal T1 weighted MRI shows, the soft tissue elements are isointense with muscle characteristics, while cystic components show low signal intensity. Fat is seen as high signal intensity (arrowhead) (d).

## DISCUSSION

Immature teratomas are rare tumors that differ from benign teratomas in that the component tissue resembles that observed in the fetus or embryo. Any type of tissue may be represented in immature teratoma, the main component is usually neurogenic, but mesodermal elements are also common. Immature teratomas grow rapidly and frequently penetrate the capsule with spread or metastases (4,5).

The pathogenesis of extragonadal immature teratoma is not completely understood. Clinically it is not possible to differentiate mature teratoma from immature teratoma. The differentiation can only be made by careful histological examination (4).

Crosssectional imaging using CT, MR imaging, allows identification of different elements within these tumors including soft tissue, fluid, fat and calcium.

Mediastinal immature teratoma typically manifests on CT as a heterogeneous anterior mediastinal mass containing soft-tissue, fluid, fat, or calcium attenuation, or any

## REFERENCES

1. Aksoy F, Sen C, Danisment N. Congenital mediastinal immature teratoma: a case report with autopsy findings. *Turk J Pediatr* 2002; 44:76-79.
2. Moran CA, Suster S. Primary germ cell tumors of the mediastinum: II. Mediastinal seminomas-a clinicopathologic and immunohistochemical study of 120 cases. *Cancer* 1997; 80:691-698.
3. Das BB, Richardson C, Lala R, Sahoo S. Primary Immature Mediastinal Teratoma in a Newborn Indian Pediatrics 2001; 38:1181-1184.
4. Col C. Immature teratoma in both mediastinum and liver of a 21-Year-old female patient. *Acta Med Austriaca* 2003; 30:26-28.
5. Hiroshima K, Toyozaki T, Iyoda A, et al. Apoptosis and proliferative activity in mature and immature teratomas of the mediastinum. *Cancer* 2001; 92:1798-1806.
6. Choi SJ, Lee JS, Song KS, Lim TH. Mediastinal teratoma: CT differentiation of ruptured and unruptured tumors. *AJR Am J Roentgenol* 1998; 171:591-594.
7. Drevelegas A, Palladas P, Scordalaki A. Mediastinal germ cell tumors: a radiologic-pathologic review. *Eur Radiol* 2001; 11:1925-32.
8. Ozeki Y, Kikuchi K, Masuda H, et al. A case of immature mediastinal teratoma. *Gan No Rinsho* 1985; 31:1825-1830.

combination of the four. Fluid-containing cystic areas, fat, and calcification occur frequently. Cystic lesions without fat or calcium were seen in 15 % of tumors. Fat-fluid levels, considered highly specific for the diagnosis of mediastinal mature teratoma, are uncommon. CT is the imaging technique of choice in the evaluation of these lesions. CT is also useful in the evaluation of associated pulmonary opacities, which usually represent atelectasis, pneumonitis, or both (6).

The most common MRI appearance of a teratoma is that a heterogeneous anterior mediastinal mass. The soft tissue elements are isointense with muscle characteristics, while cystic components show low signal intensity on T1-weighted images and high signal on T2-weighted images. Visualization of fat is, high signal intensity on T1-weighted images that useful in determining the diagnosis. MRI is also useful in the evaluation of the inflammation around the tumor (7).

The differential diagnosis of fat-containing mediastinal masses includes mediastinal fat pad, mediastinal lipomatosis, lipoma, omental herniation, thymolipoma, and liposarcoma. However, immature teratomas are easily distinguished from these lesions by their cystic appearance with predominance of fluid elements and high frequency of calcification, findings readily seen on CT scans.

In our case also, like the literature, a heterogeneous smooth-lobulated edged mass was seen arising from the right anterior mediastinum containing soft-tissue, fluid, fat and calcium attenuation.

In patients >15 years of age with immature mediastinal teratoma, complete surgical resection of the tumour is indispensable. When complete resection is combined with chemotherapy, long survival can be expected. Conversely, unless both treatment methods are performed, the outcome is very poor (3). Ozeki et al. (8) concluded that radiotherapy should be added to combination of intensive chemotherapy and surgical resection in immature mediastinal teratoma's treatment.

In conclusion, immature teratomas are rare tumors that differ from benign teratomas. The differentiation can only be made by careful histological examination. CT is the radiological modality choice for the diagnostic evaluation of these tumors and also combination of MRI best defines the characterisation, location and operability of tumor.

*Kabul Tarihi: 22.11.2007*