Singapore Med J 2012; 53(11) : e237

Mature cystic teratoma of the lung

Santosh Kumar Mondal[1], MD, *Senjuti DasGupta*[1], MD

ABSTRACT Intrathoracic teratomas are usually seen in the mediastinum; they rarely occur in the lung as intrapulmonary teratomas. The criteria for pulmonary origin are the exclusion of a gonadal site or other extragonadal primary sites and the exclusive origin of the tumour from the lung. Lung teratomas, for reasons unknown, commonly involve the upper lobe. Here, we report the case of a mature cystic teratoma (dermoid cyst) in the right middle lobe of the lung in a 22-year-old man. We present the clinical and radiological features, as well as histopathological findings, and discuss the relevant literature.

Keywords: benign teratoma, dermoid cyst, lung
Singapore Med J 2012; 53(11): e237–e239

INTRODUCTION

Teratomas can be found in different organs and may involve the ovaries, testicles, sacrococcygeal region, mediastinum and other sites, in decreasing order.[1] Intrapulmonary teratoma (IPT) originates from the totipotential cells of one, or more, of the three germinative layers, which can differentiate into any type of tissue.[2] IPTs have rarely been reported since Mohr's description of this entity in 1839.[2]

CASE REPORT

A 22-year-old Indian man presented with a three-year history of intermittent episodes of cough and haemoptysis. He also complained of occasional right-sided chest pain. The patient was a non-smoker and had no history of fever, weight loss or expectoration. Clinically, the patient had good general health with stable vitals. Auscultation of the chest revealed coarse crackles over the right middle and upper lobes. Chest radiograph showed a large well-defined opacity in the middle lobe of the right lung. A bronchoscopy revealed white mucopurulent patches over the mucosa of the right middle lobe bronchus and its superficial branches. Bronchoscopy failed to detect any growth or compression from the outside. Bronchoalveolar lavage was taken and microscopic examination showed the presence of inflammatory cells and occasional epithelial cells. No malignant cell was found. Sputum culture for acid-fast bacilli (AFB) was negative. Ziehl-Neelsen stain of the sputum smears was also negative for AFB. Computed tomography (CT) of the thorax showed a rounded, well-defined cystic mass (4.6 cm x 5.4 cm x 4 cm) containing fluid and fat in the middle lobe of the right lung (Fig. 1a). A CT-guided fine needle aspiration was done. The smears contained benign epithelial cell clusters (squamous as well as columnar cells), amorphous debris and inflammatory cells. No granuloma or malignant cell was detected. A cytodiagnosis of teratoma was given after correlating with clinicoradiological features.

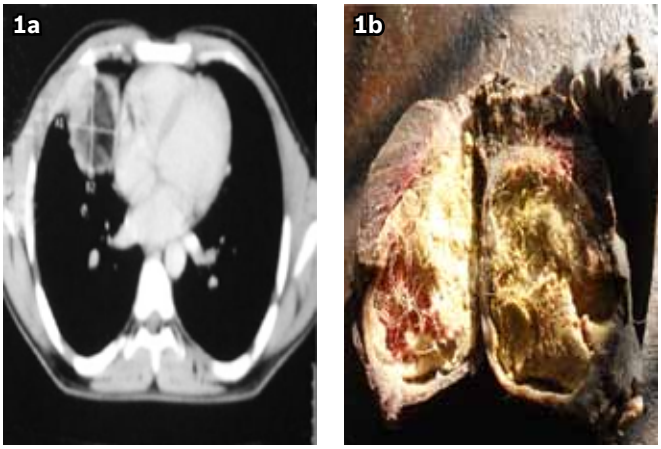

Fig. 1 (a) CT image shows a well-circumscribed cystic mass containing fluid and fat in the right middle lobe of the lung. No rupture of the mass was seen. (b) Photograph of the tumour shows the cyst containing sebaceous material and tufts of hair.

The patient underwent right antero-lateral thoracotomy, and the right middle and upper lobes were removed. The resected specimen, measuring 14 cm x 10 cm x 5.5 cm, was sent for histopathological examination. The external surface was unremarkable and the pleurae were not thickened. The bronchial margin was identified and submitted as a cut margin. Then, the first section was made along the greatest dimension of the lobe, passing through the hilum from the medial to the lateral, after which 1 cm parallel slices to the first section were made. The cut section revealed a well-circumscribed cystic mass (5 cm x 4 cm) on the inner side of the middle lobe. Grumous (sebaceous) material and tufts of hairs were found in the cystic lesion. Blood vessels and adjacent bronchi were unremarkable and free of any tumour (Fig. 1b). The distance from the bronchial cut margin to the mass was 3.8 cm. Multiple sections (n = 7–8) were taken from the tumour to exclude the possibility of immature teratoma. Microscopic examination revealed a variety of cell lines consisting of squamous epithelium, hair follicles, sebaceous glands,

[1]Department of Pathology, Medical College, Kolkata, India
Correspondence: Dr Santosh Kumar Mondal, Associate Professor, Department of Pathology, 88 College Street, Medical College, Kolkata 700073, West Bengal, India. dr_santoshkumar@hotmail.com

fatty tissue, benign glands and fibromuscular tissue (Figs. 2 & 3). Collections of lymphoid cells with occasional lymphoid follicles were also seen. No immature tissue or neuroepithelial tissue was found. Hence, a final diagnosis of mature cystic teratoma (dermoid cyst) of the lung was established. The patient was on a six-month follow-up, which was uneventful.

DISCUSSION

Intrathoracic teratomas almost always occur in the mediastinum and only very rarely arise within the lung.[3] Most authors have found IPTs in the left lung, but Asano et al[1] contradicted this finding. However, there is a predilection for the upper lobes on both sides. For this predilection, it is presumed that IPTs develop, in relation to the thymus, as derivatives of the third pharyngeal pouch. The presence of an IPT may be due to displacement or separation of the thymus during early embryogenesis.[4] IPTs occur in adults as well as children, with the age ranging from 10 months to 68 years.[4] The majority of patients are diagnosed in the first two decades. Patients with IPT present with chest pain (52%), haemoptysis (42%) and cough (39%). The most specific symptom is the expectoration of hair or trichoptysis (13%).[5] Although the first three symptoms were present in our case, trichoptysis was absent. Radiologically, lesions are typically cystic, often with focal calcification. CT imaging can estimate the density of different elements, such as soft tissue (in most of the cases), fluid (88%), fat (76%), calcification (53%) and teeth.[6] In our case, CT imaging detected soft tissue elements, fluid and fat, but no calcification was found within the tumour. CT is extremely useful for the differentiation between a ruptured and an unruptured teratoma.[3] If rupture occurs, the internal density becomes heterogeneous, the tumour margins become irregular, and the fat component changes from spherical to a bursting configuration.[7]

Histopathologically, IPTs are similar to other benign cystic teratomas that have endodermal, mesodermal and ectodermal elements. The presence of squamous differentiation is seen in most cases. Although the presence of mature cartilage has been reported by many authors, this element was absent in our case. Due to the presence of various tissues within IPTs, such tumours can produce digestive or proteolytic enzymes, making them prone to rupture.[1] In our case, no rupture was found and the tumour was well-encapsulated. Moran et al reported seven cases of metastatic mature teratoma in the lung from testicular teratocarcinoma and embryonal carcinoma, whose histological findings were indistinguishable from IPT.[8] Hence, detailed clinical examination and diagnostic work-up should be performed in order to rule out a small or occult extrapulmonary germ cell tumour. In our present case, no testicular or germ cell tumour at other sites was detected after a thorough examination.

Surgical resection of the IPT is the treatment of choice due to the IPT's potential for rupture.[9] The other reason for surgical resection is the high percentage (approximately 30%) of malignant teratomas.[3] Malignant teratoma is defined by the presence of immature tissue within the teratoma rather than the presence of metastases or infiltration. In the present case, no immature tissue was present. Interestingly, malignant teratoma is more frequently found in women (n = 12) than in men (n = 5).[3] The prognosis of malignant teratoma is poor. In a study comprising 11 patients with malignant teratoma, seven (63.6%) patients died within the six-month follow-up period, even after surgical resection of the tumour. Metastases were detected in three of these cases.[10]

In conclusion, IPT is a rare tumour, and surgery is the definitive treatment. The present case is unusual as the tumour occurred in the middle lobe of the right lung, as compared to the common occurrence in the upper lobe of the left lung.

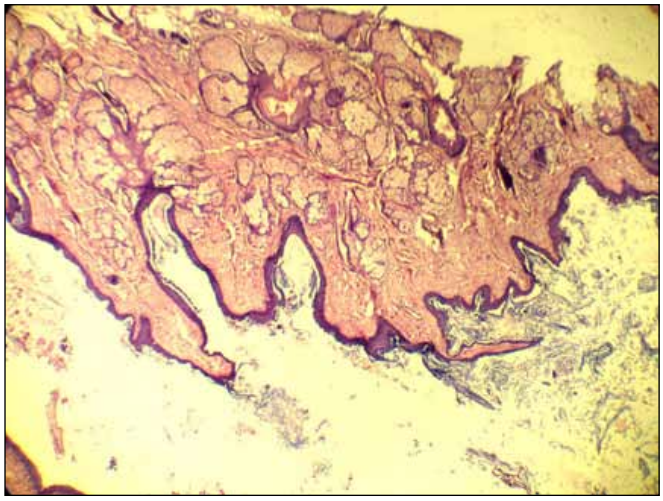

Fig. 2 Photomicrograph shows keratinous debris, squamous epithelial lining of epidermis, sebaceous glands and hair follicles (Haematoxylin & eosin, x 100).

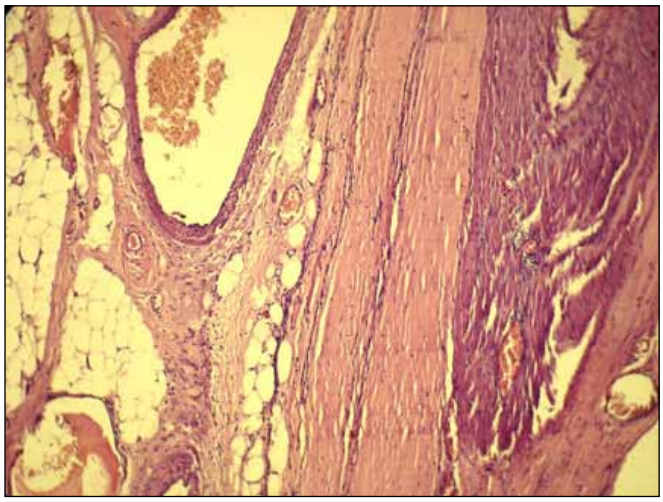

Fig. 3 Photomicrograph shows adipose (fatty) tissue, muscular tissue and vascular spaces (Haematoxylin & eosin, x 400).

REFERENCES

1. Asano S, Hoshikawa Y, Yamane Y, Ikeda M, Wakasa H. An intrapulmonary teratoma associated with bronchiectasia containing various kinds or primordium: a case report and review of the literature. Virchows Arch 2000; 436:384-8.
2. Joo M, Kang YK, Lee HK, et al. Intrapulmonary and gastric teratoma: report of two cases. J Korean Med Sci 1999; 14:330-4.

3. Zenker D, Aleksic I. Intrapulmonary cystic benign teratoma: a case report and review of the literature. Ann Thorac Cardiovasc Surg 2004; 10:290-2.
4. Carter D, Eggleston JC. Teratoma. In: Hartmann WH, ed. Tumor of the Lower Respiratory Tract. Washington: Armed Forces Institute of Pathology, 1980: 325-6.
5. Saini ML, Krishnamurthy S, Kumar RV. Intrapulmonary mature teratoma. Diagn Pathol 2006; 1:38.
6. Drevelegas A, Palladas P, Scordalaki A. Mediastinal germ cell tumors: a radiologic-pathologic review. Eur Radiol 2001; 11:1925-32.
7. Cheung YC, Ng SH, Wan YL, Pan KT. Ruptured mediastinal cystic teratoma with intrapulmonary bronchial invasion: CT demonstration. Br J Radiol 2001; 74:1148-9.
8. Moran CA, Travis WD, Carter D, Koss MN. Metastatic mature teratoma in lung following testicular embryonal carcinoma and teratocarcinoma. Arch Pathol Lab Med 1993; 117:641-4.
9. Shao ZY, Massiani MA, Bazelly B, et al. [Intrapulmonary rupture of a dermoid cyst: MRI findings]. Rev Pneumol Clin 2003; 59:311-6. French.
10. Morgan DE, Sanders C, McElvein RB, Nath H, Alexander CB. Intrapulmonary teratoma: a case report and review of the literature. J Thorac Imaging 1992; 7:70-7.