Case Series

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Pathology Section

Unusual Intrathoracic Lesions: A Case Series

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ABSTRACT

The thoracic cavity consists of the mediastinum located centrally which is bordered by two pleural cavities laterally. The major organs included are the thymus gland, the heart, the lungs, the tracheobronchial tree, lymph nodes and vessels. The lesions originating from the various organs are diverse and occasionally some lesions occurring are extremely rare. The aim was to study demographic features, anatomical site and histological findings of the cases. This was a prospective evaluation of the intrathoracic lesions in a tertiary care center from June 2018 to June 2020. This comprised of patient's age and sex, the clinical characteristics and location of the tumour, the duration of the lesion and the histopathological findings along with Immunohistochemistry (IHC). This case series describes 10 cases of intrathoracic lesions originating from mediastinal soft tissue, thymus gland, lungs and heart. Patient's age ranged from five months old to 48 years old with males and females equally affected. All the patients have undergone treatment and were followed-up as well. Intrathoracic lesions are unusual tumours with varied histology. These intrathoracic lesions require a multidisciplinary approach. These lesions should be examined well to determine the source of the lesion for a conclusive diagnosis. Radiological correlation along with histopathology and immunohistochemistry assists in accurate diagnosis.

Keywords: Histopathology, Immunohistochemistry, Neoplastic lesions, Thoracic cavity

INTRODUCTION

The thoracic cavity consists of the mediastinum located centrally which is bordered by two pleural cavities laterally. The major organs included are the thymus gland, the heart, the lungs, the tracheobronchial tree, lymph nodes and vessels. The lesions originating from the various organs are diverse and occasionally some lesions occurring are extremely rare. Awareness of the spectrum of thoracic mass lesions is essential to provide optimal care. In addition to common entities, there are less common malignant and benign neoplastic, non-neoplastic proliferative and hamartomatous lesions that may arise [1].

CASE SERIES

The present case series was conducted at Department of Pathology, Institute of Post Graduate Medical Education and Research, Kolkata, West Bengal (India), for two years from June 2018 to June 2020 consisting of 10 cases. Institutional Ethics Committee {IPGME&R Research Oversight Committee registered with Central Drugs Standard Control Organisation (CDSCO), Government of India, in consonance with Rule 122D of the revised Drugs and Cosmetic Rules 1945 (Registration No. ECR/35/Inst/WB/2013). It functions in accordance with revised Schedule Y and Indian Council of Medical Research (ICMR) guidelines} approved the study [2]. Informed consent was taken. The patients presented with varied clinical features according to their site of lesion. Proper history taking and clinical examination was done followed by blood investigations and radiological evaluation.

Surgical resection of the tumour masses was done and specimens were sent for further processing. After gross examinations, sections were taken from the representative areas. Paraffin embedded sections were cut and stained by haematoxylin and eosin (H&E). They were reported using a light microscope. IHC was performed to confirm the diagnosis in some cases. Cluster of Differentiation (CD)99 (Monoclonal Mouse Antibody; clone: 12E7, positive control: oesophagus, membranous staining), B-Cell Lymphoma 2 (BCL2) (Monoclonal Mouse Antibody; clone: 124, positive control: tonsil, cytoplasmic staining), Leukocyte Common Antigen (LCA) (CD45) (Monoclonal Mouse Antibody; clone: 2B11+PD7/26, positive control: tonsil, membrane staining), desmin (Monoclonal Mouse Antibody; clone: D33, positive control: skeletal and cardiac muscle cells, cytoplasmic staining) were being used for the confirmation of the diagnosis. IHC were analysed qualitatively.

Distribution of the cases is shown in [Table/Fig-1].

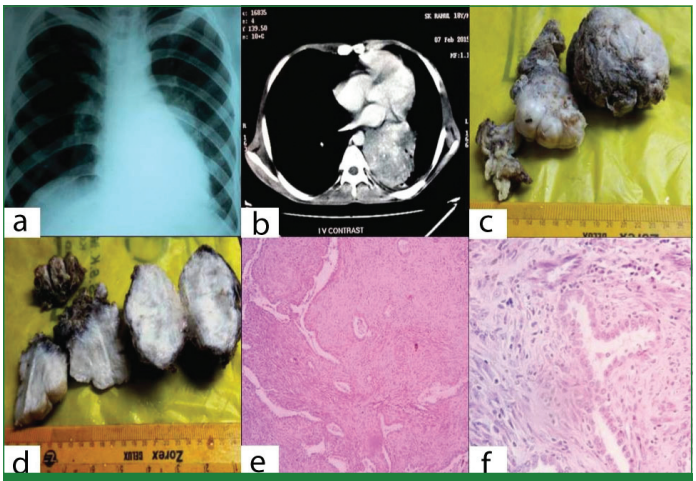
Site of the lesion	Tumour type	Number of cases	Age	Sex	
				Male	Female
Mediastinal soft tissue	Synovial sarcoma	1	20 years	0	1
	Ganglioneuroma	1	4 years	1	0
	PNET	1	5 months	1	0
Thymus gland	Thymoma	1	35 years	0	1
	Thymolipoma	1	45 years	1	0
	Hodgkin's lymphoma	1	24 years	1	0
	Mature cystic teratoma	1	45 years	1	0
Lungs	Mature cystic teratoma	1	35 years	0	1
	Inflammatory myofibroblastic tumour	1	48 years	0	1
Heart	Atrial myxoma	1	30 years	0	1

[Table/Fig-1]: Showing the distribution of cases (N=10).
PNET: Primitive neuroectodermal tumour

Case 1: Synovial Sarcoma

A 20-year-old female paitent presented with chest pain, shortness of breath and fever for two months. Physical examination showed no significant finding. Haematological parameters were within normal limit. Chest X-ray showed widening of mediastinum [Table/Fig-2a] and Computed Tomography (CT) scan of thorax showed a patchy enhancing heterogenous mass measuring 8.5×7.9×4.1 cm with areas of calcification in posterior mediastinum [Table/Fig-2b]. Tru-cut biopsy of the mediastinal mass showed a spindle cell lesion. Debulking of the mass was done and was sent for histopathological examination which revealed biphasic synovial sarcoma. Grossly the tumour showed multiple gritty fragments, largest (6 cm) maximum

dimension [Table/Fig-2c]. Cut section showed variegated areas with some bony hard areas [Table/Fig-2d]. Microscopic examination revealed a biphasic neoplasm with glandular epithelial structures lined by cuboidal cells admixed with fibroblast like spindle cell component [Table/Fig-2e,f]. The spindle cells were monomorphous with a fascicular arrangement having elongated vesicular nuclei with mild to moderate nuclear atypia. There were foci of calcification and bone formation. Tumour cells were positive for CD99 and BCL2. The diagnosis of Synovial Sarcoma (biphasic type) was confirmed. The postoperative course was uneventful and was commenced on adjuvant chemotherapy.



[Table/Fig-2]: Case 1-Synovial sarcoma: (a) Chest X-ray (AP view) shows widening of mediastinum; (b) Computed Tomography (CT) scan of thorax shows heterogenous mass; (c) Gross specimen shows gritty fragments; (d) On cut section, variegated areas with areas of calcification; (e) Section shows biphasic neoplasm with glandular epithelial structures lined by cuboidal cells admixed with fibroblast like spindle cell component (x100,H&E); (f) Corresponding histological section (x400, H&E).

Case 2: Ganglioneuroma

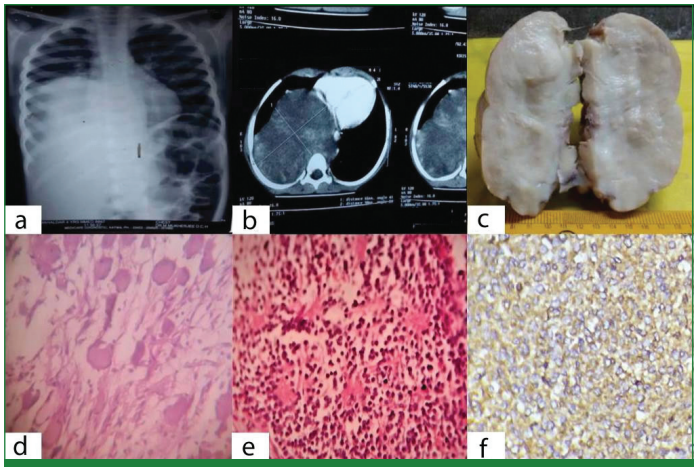
A four-year-old boy presented with recurrent cough and dyspnoea of short duration for three months. Routine investigations were within normal limits. Chest X-ray showed opacity in the right lower and mid-zone of right lung [Table/Fig-3a]. CT Chest showed a homogenous mass in the right posterior mediastinum measuring 9.8×6.6 cm [Table/Fig-3b]. Mass was resected and on gross examination, a firm well-circumscribed mass measuring 11×11×5 cm. Cut section showed greyish white homogenous areas [Table/Fig-3c]. Microscopy revealed admixture of schwann cells and mature ganglion cells having eosinophilic cytoplasm with distinct cell border, eccentric nucleus and prominent nucleolus [Table/Fig-3d]. Histopathological diagnosis was in keeping with mature ganglioneuroma. Postoperative course was uneventful and the patient is on regular follow-up without any complaints.

Case 3: Primitive Neuroectodermal Tumour (PNET)

A five months old boy presented with shortness of breath and cough for a duration of three months. Chest X-ray revealed an opacity on the left side of the chest wall. CT scan showed a homogenous mass in the left posterior mediastinum 7×6 cm. Tumour was resected. Grossly, a well-demarcated mass measuring 9×8 cm was noted. Histopathological examination showed sheets of monomorphic cells with increased nuclear cytoplasmic ratio and basophilic cytoplasm in consistent with small blue round cell tumour [Table/Fig-3e]. Rosettes formation was also noted. Further, CD99 showed nuclear positivity [Table/Fig-3f]. The diagnosis was confirmed as PNET. The patient was scheduled for concurrent chemoradiation and uncomplicated treatment course was carried out.

Case 4: Thymoma

A 35-year-old female patient presented with shortness of breath, cough with expectoration and fever for past 10 days. Breathlessness was of acute onset and gradually progressive in nature. On further examination, bilateral vesicular breath sound present on whole lung



[Table/Fig-3]: Case 2-Ganglioneuroma: (a) Chest X-ray (AP view) shows an opacity in the right lower and mid zone of right lung; (b) CT scan of thorax shows homogenous mass in the right posterior mediastinum; (c) Gross specimen on cut section shows greyish white homogenous areas; (d) Section shows admixture of schwann cells and mature ganglion cell showing eosinophilic cytoplasm with distinct cell border, eccentric nucleus (x100, H&E) Case 3-PNET; (e) Section shows sheets of monomorphic cells with rosette formation (x100, H&E); (f) IHC staining for CD99 showing positivity (x400)

field. Coarse crepts were present on left-side of chest. Routine blood and urine examinations were normal. Mediastinal widening was seen on Chest X-ray. A well-circumscribed heterogeneous solid enhancing mass lesion measuring 8.9×13.1×10.7 cm in anterior mediastinum on left side was identified on Contrast Enhanced Computed Tomography (CECT) chest. The mass was excised. Microscopic examination revealed thymus like architecture and the scattered epithelial cells are embedded within densely packed lymphocytes [Table/Fig-4a,b]. The diagnosis was thymoma type B1, according to the World Health Organisation (WHO) classification (2015) [3]. The patient was referred to the Oncology Department for further management.

Case 5: Thymolipoma

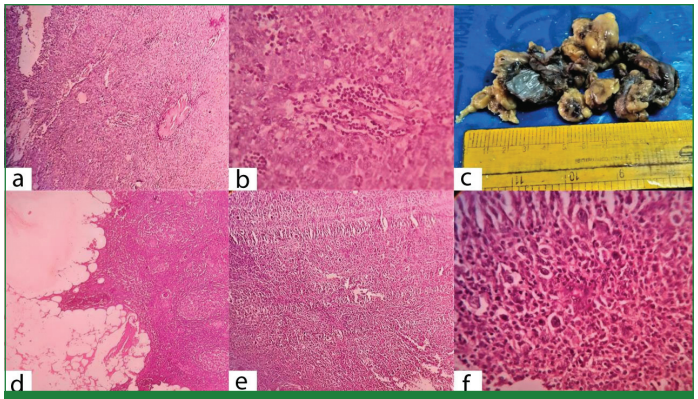
A 45-year-old male patient complaint of breathlessness on exertion and heaviness of chest for a duration two years. On auscultation of the chest, breath sounds were reduced bilaterally. Chest X-ray showed diffuse infiltration of both lungs. CT scan of thorax showed a large mass comprised of areas of fat density in the anterosuperior mediastinum (24×20×18 cm). The patient went through surgical resection. Grossly, the resected tumour was well circumscribed and composed of a yellowish tissue [Table/Fig-4c]. Microscopic examination showed mature fatty tissue along with hyperplastic thymic structures with Hassall's corpuscles [Table/Fig-4d]. A definite diagnosis of thymolipoma was made. The postoperative period was uneventful and the patient was discharged on the seventh postoperative day.

Case 6: Thymic Hodgkin's Lymphoma

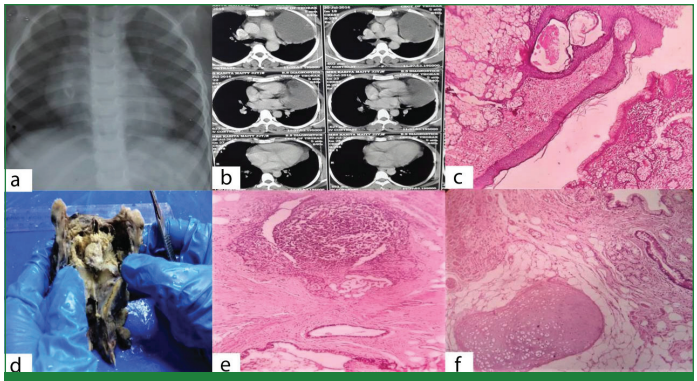
A 24-year-old male patient presented with chest pain, breathlessness and backache for 4 months. On chest auscultation, decreased breath sounds on the left side of the chest. Cardiovascular, neurological, and gastrointestinal systems were unremarkable. A Computed Tomography (CT) of the thorax discovered a superior mediastinal mass. The mediastinal mass was excised. The gross findings are multiple white nodules. Microscopy revealed a nodular infiltration of the thymus with Reed-Sternberg cells admixed with rich inflammatory background [Table/Fig-4e,f]. The histologic study confirmed a diagnosis of Hodgkin's lymphoma and was confirmed by the immunohistochemistry as CD30 and CD15 positive. The patient was referred to Oncology Department for further management.

Case 7: Mature Cystic Teratoma (Thymus)

A 45-year-old male patient presented to the respiratory Outpatient clinic with a seven month history of a dry cough and shortness of



[Table/Fig-4]: Case 4-Thymoma: (a) Section shows scattered epithelial cells with lymphocytes (x100, H&E); (b) Corresponding histological section (x400, H&E) Case 5-Thymolipoma; (c) Gross specimen; (d) Section shows mature fatty tissue along with hyperplastic thymic structures with Hassall's corpuscles(x100, H&E) Case 6-Thymic Hodgkin's lymphoma; (e) Section shows infiltration of the thymus with Reed-Sternberg cells admixed with rich inflammatory background (x100, H&E); (f) Corresponding histological section (x400, H&E)



[Table/Fig-5]: Case 7-Mature cystic teratoma- thymus: (a) Chest X-ray shows large, smooth edged opacity between right pulmonary hilum and right diaphragm; (b) CT scan thorax nodular soft tissue mass noted in right mediastinal margin; (c) Section shows keratinising squamous epithelium, sebaceous glands and intestinal epithelium (x100, H&E) Case 8-Mature cystic teratoma-Lung; (d) Gross specimen showing hair and pultaceous material; (e) Section shows areas of granulation tissue and foreign body giant cell reaction (x100, H&E); (f) Section shows intestinal epithelium, mature cartilage embedded in mature adipose tissue (x100, H&E).

breath. Physical examination revealed decreased breath sounds in lower zone of right lung. Chest X-ray revealed a large, smooth edged opacity between right pulmonary hilum and right diaphragm [Table/Fig-5a]. A CT scan of the thorax revealed a nodular soft tissue mass noted in right mediastinal margin with coarse hyperdensity within [Table/Fig-5b]. There was no lymphadenopathy. The mass was then excised and sent for histopathological examination. Grossly, the mass was 6.8×6.2×4 cm. The external surface of the mass was greyish brown, encapsulated, and bosselated. Cut surface showed yellow fatty area, greyish white nodular, and multiple cystic structures filled with mucoid material. The microscopic findings of the polypoid mass showed ectodermal derivatives like keratinising squamous epithelium, sweat gland, sebaceous gland along with mesodermal derivatives like adipose tissue, smooth muscle and endodermal derivatives like, respiratory epithelium and intestinal epithelium [Table/Fig-5c]. Based on these features, histopathological diagnosis of mature cystic teratoma of thymus was given. The follow-up of the patient in every six months was advised.

Case 8: Mature Cystic Teratoma (Lung)

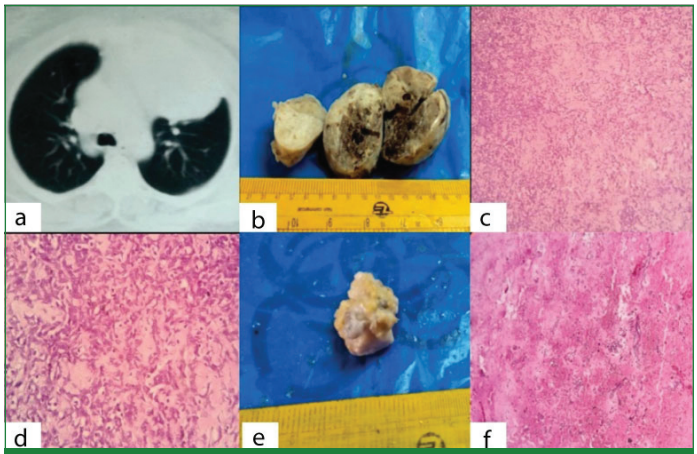
A 35-year-old female patient presented with left-sided chest pain that increased with movements and low-grade fever for the last 10 days. Crackles and sound reduction were heard in the left lung based on pulmonary auscultation. Chest X-ray indicated opacity in her left lung. A CT Chest showed a huge mass in the lower two-thirds of left lung with mediastinal shift to the opposite side. The tumour mass was excised. Macroscopically, the cyst's inner layer was heterogeneous and irregular, containing a yellow polypoid mass with hair shafts and a cut section showed fat tissue covered by a thin white layer [Table/Fig-5d]. The histopathological examination revealed ectodermal components like stratified squamous epithelium filled with keratin, ulceration and extensive areas showing granulation tissue and foreign body giant cell reaction along with endodermal elements intestinal epithelium and also presence of mesodermal elements like mature adipose tissue and mature cartilage [Table/Fig-5e,f], indicating that teratoma affected her left lung. The follow-up of the patient in every six months was advised.

Case 9: Inflammatory Myofibroblastic Tumour

A 48-year-old female patient came to Cardio-Thoracic OPD with history of breathlessness, chest pain and fever for six months. Chest X-ray showed a well-defined mass in right upper and middle hemithorax. CT scan thorax showed a well-defined mass of varying density occupying right upper and middle lobe [Table/Fig-6a]. Surgical excision was done and grossly a globular mass (9×8×3.5 cm) was seen and cut section showed small cystic and haemorrhagic areas [Table/Fig-6b]. Microscopy showed a spindle cell proliferation in a collagenous background with lymphoplasmacytic infiltration in the stroma [Table/Fig-6c,d]. Calcification and vascular proliferation were also evident. The features were in keeping with Inflammatory Myofibroblastic Tumour (IMT). IHC showed positivity for desmin. The postoperative period was uneventful and was advised to follow-up every six months.

Case 10: Atrial Myxoma

A 30-year-old female patient presented to the Cardiology Outpatient Department (OPD) with complaints of shortness of breath for the past one year and one episode of syncopal attack three days back. On examination, her vitals were stable. Systemic examination of the Cardiovascular System (CVS) revealed systolic murmur and mid-diastolic murmur (tumour plop) over the apex. Electrocardiogram (ECG) and Chest X-ray showed left atrial abnormality and right ventricular hypertrophy. Two-Dimensional (2D) echocardiography (echo) revealed a mass in the left atrium. The left atrial mass was resected. Grossly, the mass was solitary and polypoid and soft in consistency [Table/Fig-6e]. Microscopic examination showed myxoma cells with eosinophilic cytoplasm and stellate spindle cells lying within a myxoid matrix [Table/Fig-6f]. Haemosiderin laden macrophages were also noted. A definitive diagnosis of atrial myxoma was made. Postoperatively Electrocardiogram (ECG) showed normal sinus rhythm at 80 beats/minute (bpm) and a normal left ventricle ejection fraction of 60%. Patient was started on anticoagulation and is being monitored in the outpatient clinic.



[Table/Fig-6]: Case 9-Inflammatory Myofibroblastic Tumour: (a) CT scan thorax shows well-defined mass of varying density occupying right upper and middle lobe; (b) Gross specimen shows cystic haemorrhagic and necrotic areas; (c) Section shows spindle cell proliferation in a collagenous background with lymphoplasmacytic infiltration in the stroma (x100, H&E); (d) Corresponding histological section (x400, H&E) Case 10-Atrial myxoma; (e) Gross specimen; (f) Section shows myxoma cells with eosinophilic cytoplasm and stellate spindle cells lying within a myxoid matrix along with haemosiderin laden macrophages (x100, H&E).

DISCUSSION

There are many disease conditions which may be found within the thoracic cavity and which must be considered when speaking of intrathoracic tumours. The choice of treatment depends on the diagnosis, and therefore, we must endeavor to be accurate. Synovial sarcoma has been defined as a type of mesenchymal tissue cell tumour with epithelial differentiation [4].

Synovial Sarcoma is an uncommon and aggressive malignant soft tissue tumour affecting the extremities of young adults. Other sites involved are the lung, pleura, chest wall and the mediastinum [5,6]. Synovial sarcoma accounts for 5-10% of all soft tissue sarcomas in age group of 15-40 years with M:F-1.2:1 [7].Classical synovial sarcoma comprises of epithelial and spindle cell components that is the biphasic pattern. If only one cell type is present, then it is classified as monophasic spindle cell type or monophasic epithelial cell type synovial sarcoma. A poorly differentiated form of synovial sarcoma is also noted. It shows positivity for keratin 7,14,19 desmoplakin Zonula Occludens (ZO)-1, claudin-1 and occludin. Factors determining prognosis includes biphasic pattern, calcification, young age, distal site, size and mitotic activity [8]. Differential diagnosis includes Malignant Peripheral Nerve Sheath Tumour (MPNST) with glandular differentiation, sarcomatous mesothelioma and sarcomatoid carcinoma. Complete surgical resection is main mode of treatment. Radiotherapy with adjuvant chemotherapy is given for local control of disease.

Intrathoracic tumour is rare in the paediatric age of which neurogenic tumours encompasses 40-50% of childhood intrathoracic tumours [9]. Neurogenic tumours originate from embryonic neural crest cells, which constitute the ganglia, paraganglionic, and parasympathetic systems [10]. They are often asymptomatic but occasionally may present with cough or dyspnoea and rarely with hypertension, diarrhoea, and virilisation. Precise preoperative diagnosis is very difficult. Commonly situated in paraspinal retroperitoneum (30-50%), posterior mediastinum (40%), adrenal gland (20%), head and neck (10%) [9]. CT and MRI are preferred imaging modality. Ganglioneuroma is mostly seen in children than adults. Histopathology plays an important role in the definitive diagnosis. Surgical excision is the main modality of treatment and is curative [8]. Clinically, PNET are also seen in older children or adolescents with female predominance. But this patient is five-month-old. PNET, a member of the Ewing Sarcoma Family Of Tumours (ESFTs) with chromosome translocation t (11; 22) (q24; q12) giving rise to the EWS/FLI-1 fusion gene [11]. Histologically, PNET is a small blue round cell tumour with positive immunohistochemical expression for CD99, cytokeratin, CD57, and Neuron Specific Enolase (NSE).

Tumours of the thymus are among the rarest human neoplasms, accounting for less than 1% of all adult cancers, of which thymomas occur most frequently in adults. A thymoma is a low-grade malignant epithelial neoplasm of the thymus commonly situated in the anterior mediastinum [12]. There is no sex predilection. Approximately, 20-25% of patients with thymomas develop Myasthenia gravis [13]. WHO (2015) recently classified thymoma according to the histologic types based on cytological features of normal thymic epithelial cells and neoplastic cells [3]. This case of thymoma was confirmed as type B1. Thymectomy is the initial treatment for all patients with a thymoma.

Thymolipoma is an infrequent benign tumour of the thymus comprising of thymic tissue and mature fatty tissue. Thymolipomas accounts for 2-9% of thymic tumours [14]. They occur unusually in young adults but can also occur at any age and generally show no sex predilection. Around 30-50 % of these patients are asymptomatic and 10% are associated with Myasthenia gravis and other immune disorders like Grave's disease, aplastic anemia and hypogammaglobulinemia [15]. The patient in this case, did not have any of these mentioned features. Large areas of mature adipocytes are separated by thymic tissue containing epithelial cells and lymphoid cells. One study showed mutation in High Mobility Group A proteins (HMGA2) gene on chromosome 12q15 [16]. Thymolipomas are diagnosed by imaging studies where radiologically they can mimic several conditions including cardiomegaly, pleural effusion, tumours, pulmonary sequestrations, pericardial tumours and effusions. Surgical resection is the main modality of treatment.

Hodgkin's disease may affect the lymph nodes, the thymus or both. It is the most common lymphoid proliferation in the mediastinum. As the prognosis is strongly dependent on correct early treatment, thymic Hodgkin's lymphoma must always be kept in mind [17]. As compared with the systemic Hodgkin's disease, which affects the second and third decades and after the fifth decade of life and is more common in women, the thymic Hodgkin's lymphoma manifests itself in the second to third decades of life and more frequently in male [18]. Thymoma, large cell lymphoma of the mediastinum, anaplastic large cell lymphoma and mediastinal fibrosis are considered as the differentials [17]. Grossly, the thymus shows multiple firm white nodules with or without visible fibrous bands. On microscopy, the most common type is nodular sclerosis, as the other types typically affect lymph nodes but not the thymus. It is composed of lymphoid cells admixed with marked inflammatory cell infiltration and separated by wide fibrous band along with Reed–Sternberg cells which confirms the diagnosis. On small biopsies, it mimics thymoma because of the cystic changes and pseudoepithelial hyperplasia of thymic epithelium. Immunohistochemistry is essential to confirm the diagnosis. Tumour cells are positive for CD30 and CD15 [18].

Germ cell tumours most commonly involve the gonads but can rarely affect the extragonadal sites, usually in or near the midline. Mediastinal germ cell tumours are rare and accounts for 1-3% of all germ cell neoplasms [19]. Extragonadal germ cell tumours are mostly situated in the anterior mediastinum. Mediastinal germ cell tumours comprise 15% of anterior mediastinal tumours in adults and 24% in children [20]. The most common histologic type is mature teratoma followed by seminoma. Teratomas are tumours showing cells derived from all the three embryonic cell layers-ectoderm, mesoderm, and endoderm. They are further divided into differentiated, poorly differentiated, immature or with malignant transformation [21]. This was a case of mature teratoma. The common age of presentation is 20-40 years. There is no gender prediction for mature teratomas. The approach of choice is complete surgical excision. Mature teratoma is usually a benign lesion without potential to metastasize; however, 1-3% of cases are said to show malignant transformation into sarcoma, adenocarcinoma, squamous cell carcinoma, and carcinoid tumour [22]. Primary pulmonary teratomas are extremely rare [23]. Pulmonary teratomas mostly constitutes mature, cystic, somatic tissues and present as encapsulated masses with fat, calcifications or any combination of this elements. Complete resection is the ultimate treatment with a good long-term prognosis.

Inflammatory Myofibroblastic Tumour (IMT) is an uncommon benign lung tumour of unknown aetiology occurring in younger age group. They are also known as Plasma Cell Granuloma, Histiocytoma and Fibroxanthoma depending on the predominant cell type. However, despite of being benign, they spread locally, grow rapidly and even transform into sarcoma [24]. Spontaneous regression may also occur. Reported incidence is 0.04% to 7% of lung masses. There is no sex predilection. It is considered that majority of these tumours are inflammatory but there are cases of recurrences and local tissue destruction which suggests that they may represent a true neoplastic differentiation. IHC includes Smooth Muscle Actin (SMA), Muscle Specific Actin (MSA), desmin, CD 68 and Anaplastic Lymphoma Kinase (ALK) protein positivity. Differential diagnosis includes leiomyoma, leiomyosarcoma, desmoid type fibromatosis and inflammatory malignant fibrous histiocytoma, Solitary Fibrous Tumour (SFT) and haemangiopericytoma [24].

Primary cardiac tumours are occasional, with a prevalence of 1.38 per 100,000 people per year [25]. Myxomas are the most frequent

benign primary tumour of the heart situated in the left atrium near fossa ovalis. They are mostly sporadic and usually occur as an isolated lesion in middle aged women. Myxomas produce symptoms of mitral stenosis, coronary embolisation, systemic embolisation and even systemic constitutional manifestations. Systemic emboli were seen in 30-40% of left atrial myxoma patients. This array of symptoms gives a diagnostic challenge as the differential diagnosis comprises rheumatic mitral valve disease, pulmonary embolism, pulmonary hypertension, endocarditis, myocarditis and vasculitis [26]. Cerebral arteries, including the retinal arteries, are also affected. Carney Complex (CNC) is autosomal dominant in inheritance and is a multiple neoplasia syndrome comprising of cardiac myxoma, endocrine, cutaneous, and neural tumours [27]. Pigmented skin lesions, cutaneous myxomas, adrenal cortical disease, myxoid mammary fibroadenoma, and testicular tumours are the extra-cardiac manifestations of CNC. Surgical management is the treatment of choice with good prognosis. Recurrence of myxoma is very rare [28].

This was a single institution-based study and a smaller number of cases were described. This study sample is of a general population and not from a selected referral population.

CONCLUSION(S)

Intrathoracic lesions are unusual tumours with varied histology. These intrathoracic lesions require a multidisciplinary approach. These lesions should be examined well to determine the source of the lesion for a conclusive diagnosis. Radiological correlation along with histopathology and immunohistochemistry assists in accurate diagnosis.

REFERENCES

[1] Suut S, Al-Ani Z, Allen C, Rajiah P, Harbi AL, Jahdali HA. Pictorial essay of radiological features of benign intrathoracic masses. Ann Thorac Med. 2015;10(4):231-42.
[2] Imaran M, Najmi AK, Rashid MF, Tabrez S, Shah MA. Clinical research regulation in India-history, development, initiatives, challenges and controversies: Still long way to go. J Pharm Bioallied Sci. 2013;5(1):02-09.
[3] Travis WD, Brambilla E, Burke AP, Marx A, Nicholson AG (Eds.): WHO Classification of Tumours of Lung, Pleura, Thymus and Heart (4th edition). Lyon: IARC; 2015.
[4] Lucas DR, Bridge JA. World Health Organization Classification of Tumours. Pathology and Genetics of Tumours of Soft Tissue and Bone. Lyon: IARC Press; 2002.
[5] Suster S, Moran CA. Primary synovial sarcomas of the mediastinum: A clinicopathologic, immunohistochemical, and ultrastructural study of 15 cases. Am J Surg Pathol. 2005;29(5):569-78.
[6] Hsieh PP, Ho WL, Peng HC, Lee T. Synovial sarcoma of the mediastinum. Chinese Medical Journal. 2002;65(2):83-85.
[7] Trupiano JK, Rice TW, Herzog K. Mediastinal synovial sarcoma: Report of two cases with molecular genetic analysis. Ann Thorac Surg. 2002;73(2):628-30.
[8] Juan Rosai. Soft tissues. Rosai and Ackerman's Surgical Pathology, 10th ed. Elsevier's; 2011;2176.
[9] Shetty PK, Balaiah K, Gnana, Prakash S, Shetty PK. Ganglioneuroma always a histopathological diagnosis. Online J Health Allied Scs. 2010;9(4):19.
[10] Hayat J, Ahmed R, Alizai S. Giant ganglioneuroma of the posterior mediastinum. Interactive Cardio Vasc Thoracic Surgery. 2011;13(3):344-45.
[11] Cotterill SJ, Ahrens S, Paulussen M, Jurgens HF, Voute PA, Gadner H, et al. Prognostic factors in Ewing's tumour of bone: Analysis of 975 patients from the European Intergroup Cooperative Ewing's Sarcoma Study Group. J Clin Oncol. 2000;18(17):3108-14.
[12] Bushan K, Sharma S, Verma H. A review of thymic tumours. Indian J Surg Oncol. 2013;4(2):112-16.
[13] Sakurai T, Sakamoto T, Wakasa T, Ohta Y, Shiono H. Thymoma in middle mediastinum that induced tracheal compression- Case report and literature review. International Journal of Surgery Case Reports. 2017;30:186-89. PMID: 28024212.
[14] Molinari F, Alaxander AB, Roland LE. Fat-containing lesions in adult thoracic imaging. Am Radio J. 2011;197(5):795-813.
[15] Alar T, Ozcelic C, Kilinic N. Giant mediastinal mass: Thymolipoma. Southern Medical Journal. 2011;104(5):353-54.
[16] Hudacko R, Aviv HH, Langenfeld JJ, Fyfe BB. Thymolipoma: Clues to pathogenesis revealed by cytogenetics. Ann Diag Path. 2009;13(3):185-88.
[17] Ayadi-Kaddour A, Mlika M, Djilani H, El Mezni F. Primary thymic Hodgkin's lymphoma: A rare mediastinal mass. Respiratory medicine CME. 2008;1(1):48-50.
[18] Zambidio AR, Lanzas JT, Fernandez PJ, Calvo MJR, Paricio PP. Hodgkin disease of thymic origin. J Thorac and Cardiovasc Surgery 2002;123(6):1208-10.
[19] Murray J, Amin F, Shah S, Cooper S. Mature teratoma of thymus. BMJ Case Rep. 2013;2013:bcr2013010127.
[20] Shameem M, Qaseem DSM, Siddique MA, Shah NN, Ahmad A. Mature mediastinal teratoma in adult. Respiratory Medicine. 2010;3(2):116-17.
[21] Dhond AP, Agarwal SO, Sirmukkadam SV, Srinath S, Roplekar P, Desai PR. Mediastinal teratoma: A case report with review of literature. J Sci Soc. 2016;43(1):57-59.
[22] Tu L, Sun L, Zhou Y, Gong Y, Xue J, Gao G, et al. Postoperative radiotherapy for residual tumour of primary mediastinal carcinoid teratoma. J Thorac Dis. 2013;5(2):E61-64.
[23] Turna A, Özgül A, Kahraman S, Gürses A, Fener N. Primary pulmonary teratoma: Report of a case and the proposition of bronchotrichosisas a new term. Ann Thorac Cardiovasc Surg. 2009;15:247-49.
[24] Singh RS, Dhaliwal RS, Puri D, Behera D, Das A. Inflammatory pseudotumour of the lung: report of a case and review of literature, Indian J. Chest Dis. Allied Sci. 2001;43:231-33.
[25] Cresti A, Chiavarelli M, Glauber M, Tanganelli P, Scalese M, Cesareo F, et al. Incidence rate of primary cardiac tumours: A 14-year population study. J Cardiovasc Med. 2016;17(1):37-43.
[26] Ekmektzoglou KA, Samelis GF, Xanthos T. Heart and tumours: Location, metastasis, clinical manifestations, diagnostic approaches and theraupeutic considerations. J Cardiovasc Med. 2008;9(8):769-77.
[27] Takigami M, Kawata M, Kintsu M, Kodaira M, Sogabe K, Kato Y, et al. Familial carney complex with biatrial cardiac myxoma. J Cardiol Cases. 2017;15(5):155-57.
[28] Syed T, Ahir D, Gupta MK, Prasad A. Case report of a rare benign cardiac tumour: Atrial myxoma. Heart India. 2015;3(4):101-02.

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