Histopathological Characteristics of Mediastinal Tumors through 11 Years

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Background: Mediastinal masses are rare. However, masses that grow in the confined space of the mediastinum can be life-threatening because they involve many important structures.

Objective: To evaluate the epidemiological and histopathological characteristics of mediastinal masses over 11 years.

Design: A Retrospective Observational Study.

Setting: Cardiac Center, Bahrain Defence Force − Royal Medical Services Hospital (BDF-RMS), Bahrain.

Method: All patients who underwent surgical resection of a mediastinal mass from January 2007 to December 2017 were included in the study. Patients' personal characteristics and histopathological data were analyzed.

Result: Fifty-five patients underwent surgical resection of a mediastinal mass through 11 years; 38 (69.1%) were in the anterior mediastinum, 9 (16.4%) were in the middle mediastinum and 8 (14.5%) were in the posterior mediastinum. Thirty-one (56.4%) were males and 24 (43.6%) were females; the mean age was 46.6 years. Nineteen (34.5%) were non-neoplastic lesions and 36 (65.5%) were neoplastic lesions. Ten (18.2%) tumors were benign while 26 (47.3%) were malignant; 13 (23.6%) were primary and 13 (23.6%) were metastatic.

Conclusion: In this study, the majority of the mediastinal masses occurred in the anterior mediastinum. Complete resection of these masses can be curative in most cases.

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The mediastinum is a confined space in the middle of the thoracic cavity. It consists of the entire thoracic viscera, including the heart and great vessels, except the lungs[1,2]. The mediastinum is divided into three parts: anterior, middle and posterior. Mediastinal tumors are rare, comprising only 3% of tumors occurring within the chest[2,3]. They can be either primary or secondary. Secondary or metastatic tumors in the mediastinum generally occur more frequently than primary tumors[2-4]. Masses in the anterior mediastinum include thymomas, lymphomas, germ cell tumors, thyroid and parathyroid lesions. Masses in the middle mediastinum include congenital cysts, lymphomas and metastatic tumors. Masses in the posterior mediastinum include lymphomas, neurogenic and mesenchymal tumors[1-3,5,6].

A growing mass in the mediastinum could be life-threatening[3]. Patients could be asymptomatic or present with symptoms of mediastinal obstruction. Such symptoms include cough, dyspnea, dysphagia and hoarseness of the voice as a result of compression of adjacent structures[4,7,8]. Mediastinal tumors are diagnosed through CT scan; however, they can also be detected through plain chest X-ray[1,3,4]. This is the first study evaluating mediastinal tumors in the Kingdom of Bahrain.

The aim of this study is to evaluate the epidemiological and histopathological characteristics of mediastinal masses over 11 years.

METHOD

All patients who underwent surgical resection of a mediastinal mass from January 2007 to December 2017 were included in this study. The specimens were labeled as mediastinal mass, lymph nodes from the mediastinum and thymus gland. The following were documented: age, gender, diagnosis, histopathology report, immunohistochemistry tests and the procedure(s) performed. This study includes all mediastinal masses, primary or secondary, in both children and adults and excludes cases with incomplete histopathological data and all reactive lymph nodes.

The collected data were analyzed. The masses were classified as either non-neoplastic lesions or neoplastic lesions. Neoplastic lesions were further classified into benign and malignant tumors. Malignant tumors were further classified into primary and secondary tumors.

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RESULT

Fifty-five cases were included in the study; 19 (34.5%) were non-neoplastic lesions including cystic lesions and retrosternal goiters; 36 (65.5%) were neoplastic lesions, 10 (18.2%) were benign tumors, and 26 (47.3%) were malignant, 15 (27.3%) primary and 11 (20%) secondary, see table 1. Thirty-eight (69.1%) masses were in the anterior mediastinum, 9 (16.4%) in the middle mediastinum and 8 (14.5%) in the posterior mediastinum. The mean age of presentation was 46.6 years (range: 14-74); male to female ratio was 1.3:1, see table 1. The mean age of males was 48.1 years compared to 44.7 years in females. Immunohistochemistry studies were performed when applicable.

Table 1: Epidemiological Profile of Mediastinal Masses

Type of Lesion	Non-neoplastic Lesions	Neoplastic Lesions			Total
		Benign Lesions	Primary Malignant	Secondary Malignant	
Age Group (years)					
10-24	2 (3.6%)	1 (1.8%)	4 (7.3%)	1 (1.8%)	8 (14.5%)
25-39	2 (3.6%)	3 (5.5%)	6 (10.9%)	1 (1.8%)	12 (21.8%)
40-54	5 (9.1%)	4 (7.3%)	3 (5.5%)	2 (3.6%)	14 (25.5%)
55 ≤	10 (18.2%)	2 (3.6%)	2 (3.6%)	7 (12.7%)	21 (38.1%)
Gender					
Male	12 (21.8%)	3 (5.5%)	10 (18.2%)	6 (10.9%)	31 (56.4%)
Female	7 (12.7%)	7 (12.7%)	5 (9.1%)	5 (9.1%)	24 (43.6%)
Total	**19 (34.5%)**	**10 (18.2%)**	**15 (27.3%)**	**11 (20%)**	**55 (100%)**

Non-neoplastic lesions include retrosternal goiter and cystic lesions, see figure 1. The average age of presentation was 51.3 years. The incidence of multinodular goiter and cystic lesions was similar amongst males and females. Cystic lesions include thymic cysts, bronchial cysts and pericardial cysts, see figure 2 and table 2.

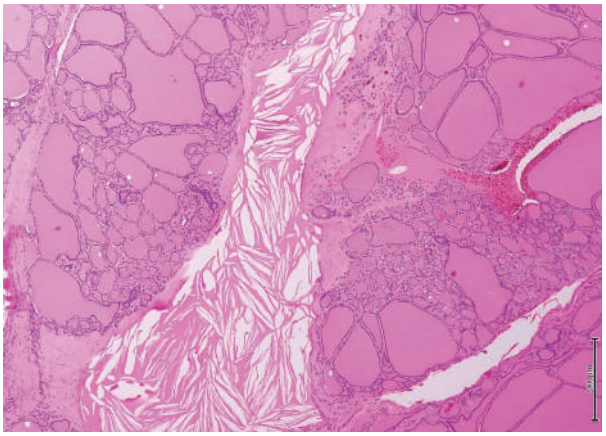

Figure 1: Thyroid Goiter with Retrosternal Extension Showing Multiple Thyroid Follicles of Varying Sizes Arranged in Nodular Pattern with Cholesterol Clefts in the Center

Ten (18.2%) were benign neoplasms of the mediastinum. The mean age of presentation was 43.3 years and the majority was in females, see table 1. Eight (14.5%) were benign thymic masses: 6 (10.9%) thymomas and 2 (3.6%) thymolipomas, see table 2. One (1.8%) was WHO Type B1 thymoma, 3 (5.5%) were Type B2 and 2 (3.6%) were Type B3, see figures 3 and 4. A mature cyst teratoma measuring 9x6x5cm was resected from a 48-year old female. An encapsulated benign schwannoma was resected from a 19-year old female, see figure 5.

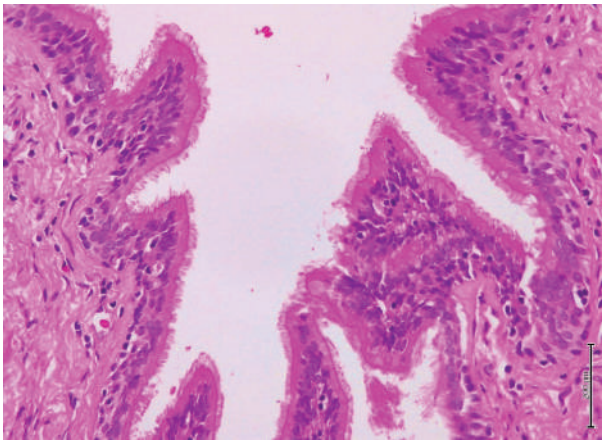

Figure 2: Bronchial Cyst Lined by Ciliated Respiratory Columnar Epithelium

Table 2: Classification of Mediastinal Masses

	Males	Females	Total (%)
NON-NEOPLASTIC LESIONS [N=19 (34.5%)]			
Retrosternal Goiter	8 (14.5%)	5 (9.1%)	**13 (23.6%)**
Cystic Lesions [N=6 (10.9%)]			
Thymic Cyst	2 (3.6%)	-	**2 (3.6%)**
Bronchial Cyst	2 (3.6%)	1 (1.8%)	**3 (5.5%)**
Pericardial Cyst	-	1 (1.8%)	**1 (1.8%)**
NEOPLASTIC LESIONS [36 (65.5%)]			
Primary Tumors			
Thymic Lesions [N=10 (18.2%)]			
Thymoma	3 (5.5%)	3 (5.5%)	**6 (10.9%)**
Thymolipoma	-	2 (3.6%)	**2 (3.6%)**
Thymic Carcinoma	1 (1.8%)	-	**1 (1.8%)**
Myxoid Liposarcoma	1 (1.8%)	-	**1 (1.8%)**
Nodal Lesions [N=7 (12.7%)]			
Hodgkin's Lymphoma	4 (%)	1 (1.8%)	**5 (9.1%)**
Non-Hodgkin's Lymphoma	1 (1.8%)	1 (1.8%)	**2 (3.6%)**
Thyroid Lesions [N=2 (3.6%)]			
Papillary Carcinoma	-	2 (3.6%)	**2 (3.6%)**
Germ Cell Tumors [N=2 (3.6%)]			
Mature Cyst Teratoma	-	1 (1.8%)	**1 (1.8%)**
Teratocarcinoma	1 (1.8%)	-	**1 (1.8%)**
Neurogenic Tumors [N=1 (1.8%)]			
Schwannoma	-	1 (1.8%)	**1 (1.8%)**
Mesenchymal Tumors [N=1 (1.8%)]			
Myxoid Chondrosarcoma	-	1 (1.8%)	**1 (1.8%)**
Secondary Tumors [N=13 (23.6%)]			
Small Cell Lung Carcinoma	1 (1.8%)	1 (1.8%)	**2 (3.6%)**
Non-Small Cell Lung Carcinoma	1 (1.8%)	1 (1.8%)	**2 (3.6%)**
Solitary Fibrous Tumor	1 (1.8%)	1 (1.8%)	**2 (3.6%)**
Adenocarcinoma	1 (1.8%)	1 (1.8%)	**2 (3.6%)**
Papillary Carcinoma (bladder)	1 (1.8%)	-	**1 (1.8%)**
Clear Cell Renal Carcinoma	-	1 (1.8%)	**1 (1.8%)**
Mesothelioma	1 (1.8%)	-	**1 (1.8%)**
Undifferentiated Carcinoma	2 (3.6%)	-	**2 (3.6%)**
Total	**31 (56.4%)**	**24 (43.6%)**	**55 (100%)**

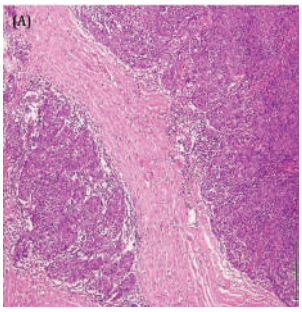

Figure 3 (A): Low Power - Thymoma Type B3 Composed of Sheets of Epithelial and Lymphocytes Separated by Fibrocollagenous Bands

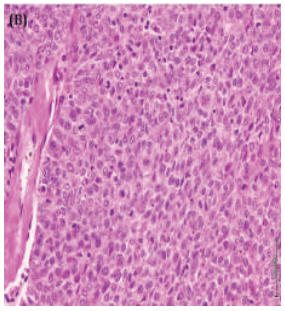

Figure 3 (B): High Power - Thymoma Type B3 Composed of Sheets of Epithelial and Lymphocytes Separated by Fibrocollagenous Bands

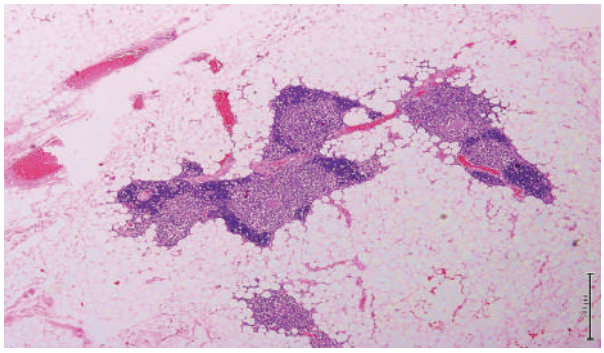

Figure 4: Thymolipoma Composed of a Mixture of Mature Adipose Tissue and Normal-Looking Thymic Tissue

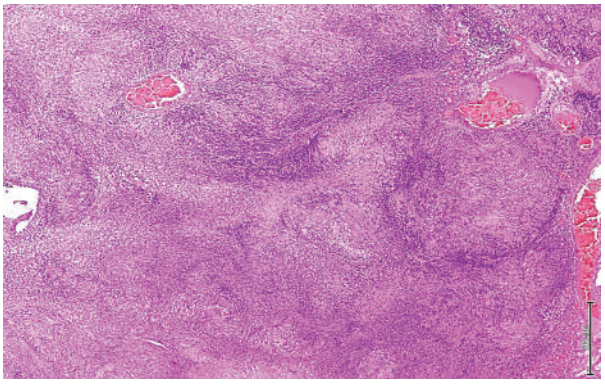

Figure 5: Schwannoma Showing Hypo and Hyper Spindle Cell Areas Arranged in Nodular Pattern

Twenty-six (47.3%) were malignant mediastinal tumors; 13 (23.6%) were primary and 13 (23.6%) were secondary. The mean age of presentation was 44.5 years. Sixteen (29.1%) were males and 10 (18.2%) were females. Seven (12.7%) were primary lymphomas of the mediastinum, see table 2. Five (9.1%) were Hodgkin's lymphoma with a mean age of presentation of 31.4 years, see figure 6. Two (3.6%) were non-Hodgkin's lymphomas, with a mean age of presentation of 33 years. Both cases stained positive for CD20 and CD79a, and both were diagnosed as large B-cell lymphoma, see figure 7. Table 3 demonstrates the immunohistochemical studies performed for primary mediastinal tumors.

Two (3.6%) were malignant thymic lesions: one (1.8%) was a thymic carcinoma and the other was a myxoid liposarcoma

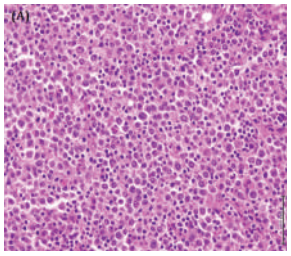

Figure 6 (A): H&E Stain - Non-Hodgkin's Diffuse Large B Cell Lymphoma

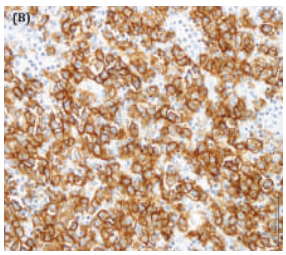

Figure 6 (B): CD20 +ve (IHC) - Non-Hodgkin's Diffuse Large B Cell Lymphoma

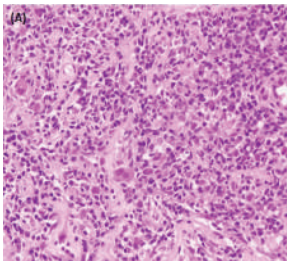

Figure 7 (A): Hodgkin's Lymphoma - Reed Sternberg (RS) Cells with Mixed Cellularity in the Background

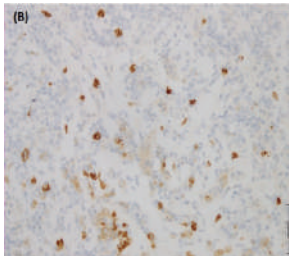

Figure 7 (B): Hodgkin's Lymphoma - RS Cells are Positive for CD15 Marker (IHC)

Table 3: Immunohistochemistry of Primary Mediastinal Tumors

Diagnosis and Demographics		CD3	CD15	CD20	CD30	CD34	CD79a	Cyclin D1	Bcl-2	EMA	LCA	S100	Pankeratin	Ki-67	Vimentin
Hodgkin's Lymphoma															
M	17	-	+	+	+	N/A	N/A	-	N/A	N/A	N/A	N/A	-	N/A	N/A
M	33	-	+	+	+	-	N/A	-	N/A	+	N/A	-	-	N/A	N/A
F	54	-	+	+	+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A
Non-Hodgkin's Lymphoma															
F	22	-	-	+	-	N/A	+	-	-	-	+	N/A	-	+++	-
M	38	-	-	+	-	N/A	+	N/A	+	N/A	+	N/A	-	+++	N/A

Note: N/A: The Test Was Not Performed

- Indicates Negative; + Indicates Positive

(1.8%); both were found in the anterior mediastinum, see table 2. The thymic carcinoma stained positive for pancytokeratin and negative for LCA and chromogranin, see figure 8. The myxoid liposarcoma was diagnosed based on the presence of atypical lipoblasts in myxoid stroma, see figure 9.

Two (3.6%) papillary thyroid carcinomas were incidental findings during the resection of the multinodular goiters with retrosternal extensions, see figure 10. Both were resected from young females aged 14 and 28.

A large, primary malignant germ cell tumor of teratocarcinoma type in the mediastinum was resected from 35-year-old male and was reported during the study period. It measured 21x18x8cm and weighed 2.245kg. The diagnosis was confirmed by the application of immunohistochemical markers.

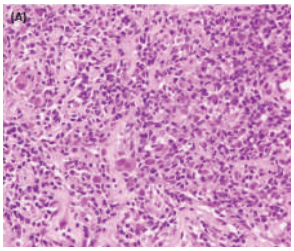

Figure 8 (A): Thymic Carcinoma H&E Stain

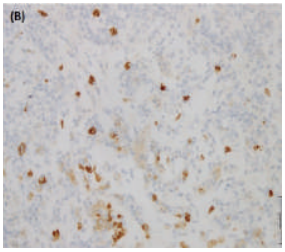

Figure 8 (B): Thymic Carcinoma: The Tumor Cells are Positive for Pancytokeratin Marker (IHC)

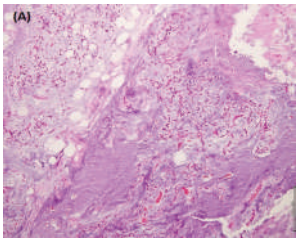

Figure 9 (A): Low Power Microscopic View: Myxoid Liposarcoma Showing Foci of Adipose Tissue Mixed with Capillary Network in Myxoid Stroma

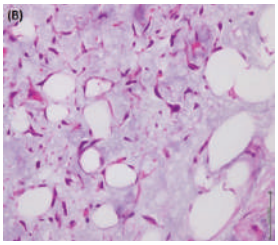

Figure 9 (B): High Power Microscopic View Shows Atypical Lipoblasts in Myxoid Stroma (H&E): Myxoid Liposarcoma Showing Foci of Adipose Tissue Mixed with Capillary Network in Myxoid Stroma

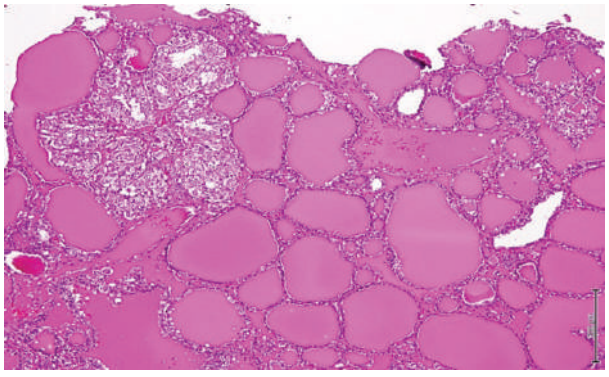

Figure 10: Thyroid Goiter with Incidental Finding of Papillary Carcinoma in the Left Upper Corner

Thirteen (23.6%) tumors metastasized to the mediastinum. Table 4 shows the patients' age, gender and type of secondary mediastinal tumors with immunohistochemistry studies. Figures 11 and 12 show the microscopic appearances of metastatic esophageal adenocarcinoma and small cell lung carcinoma, respectively.

Fourteen (25.5%) patients were diagnosed through CT-guided fine-needle aspiration (FNAC). Thymectomy was performed on 6 (10.9%) patients, 5 (9.1%) of which were benign tumors. To obtain a biopsy for histopathological diagnosis, a mediastinoscopy was performed on 9 (16.4%) patients and a Tru-Cut biopsy (TCB) was obtained from 7 (12.7%) patients. The remaining had a biopsy through other procedures such as a lobectomy or thoracotomy, where a lymph node was resected along with the mass. CT scan was the best imaging modality to localize the mediastinal tumors and determine their exact sizes and numbers, thus it was performed on all cases. PET scan was done in some cases.

Table 4: Patients' Age, Gender and Types of Secondary Mediastinal Tumors with Immunohistochemistry Studies

	Diagnosis	Patient Age	Gender	IHC stains
1	Small cell lung carcinoma	63	M	CD56 +ve, NSE +ve, Pancytokeratin +ve, TTF-1 +ve, Chromogranin +ve, P63 –ve, CK20 –ve.
2	Small cell lung carcinoma	60	F	CD56 +ve, NSE +ve, Pancytokeratin +ve, TTF-1 +ve, Chromogranin +ve, P63 –ve, CK20 –ve.
3	Large cell lung carcinoma	70	F	CK7 +ve, Pancytokeratin +ve, TTF-1 +ve.
4	Undifferentiated carcinoma (superior sulcus tumor)	51	M	Cytokeratin +ve, All other markers –ve.
5	Solitary fibrous tumor	56	M	CD34 +ve, Vimentin +ve, Beta Catenin +ve, CD99 +ve, Bcl2 +ve, S100 –ve, Desmin –ve, EMA –ve.
6	Solitary fibrous tumor	24	F	CD34 +ve, Vimentin +ve, Beta Catenin +ve, CD99 +ve, Bcl2 +ve, S100 –ve, Desmin –ve, EMA –ve.
7	Adenocarcinoma (Esophageal origin)	47	M	Not Performed as primary was known esophageal adenocarcinoma.
8	Adenocarcinoma (Probably pleural origin)	60	F	CEA +ve, EMA +ve, MOC31 +ve, CK 5/6 –ve, WT1 –ve, S100 –ve, TTF-1 –ve, P63 –ve, CD15 –ve.
9	Papillary carcinoma of the bladder	70	M	CK7 +ve, CK20 +ve, CEA +ve, TTF-1 –ve.
10	Clear cell renal carcinoma	56	F	Vimentin +ve, CK7 +ve, TTF-1 –ve, CEA –ve.
11	Mesothelioma	59	M	Pankeratin +ve, Calretinin +ve, WT1 +ve, P63 –ve, TTF-1 –ve, S100 –ve.
12	Undifferentiated carcinoma	34	M	Cytokeratin +ve, Vimentin +ve, All other markers –ve.
13	Poorly differentiated carcinoma with sarcomatoid changes	73	M	Cytokeratin +ve, Vimentin +ve, All other markers –ve.

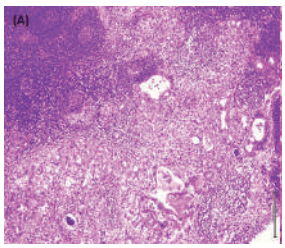

Figure 11 (A): Esophageal Adenocarcinoma: (A) Showing Lymph Node with Metastasis

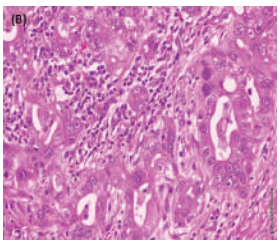

Figure 11 (B): Esophageal Adenocarcinoma: High Power Microscopic View Shows Malignant Adenocarcinoma (H&E)

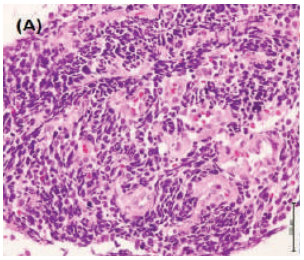

Figure 12 (A): Small Cell Carcinoma: High Power Microscopic View (H&E stain)

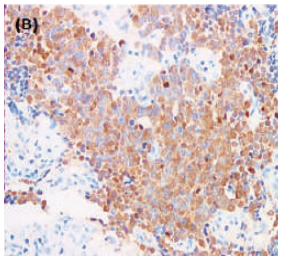

Figure 12 (B): Small Cell Carcinoma: Tumor Cells Positive for IHC NSE Tumor Marker

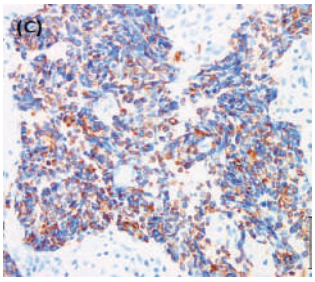

Figure 12 (C): Small Cell Carcinoma: Tumor Cells Positive for IHC Pankeratin Tumor Marker

DISCUSSION

Mediastinal tumors constitute approximately 3% of tumors in the chest[1-3]. Mediastinal tumors are usually diagnosed in patients between the third and fifth decades of life[2,4]. Almost half of our patients were above the age of 50 years. Dasgupta et al and Aroor et al reported a mean age of presentation of 18 years and 45.4 years, respectively[1,3]. However, both demonstrated that mediastinal tumors were diagnosed twice in men compared to women[1,3]. In our study, both the incidence and the age of presentation were higher in males than in females.

Patients with mediastinal masses either present with local or systemic symptoms due to the compression or invasion[3,4,8]. In some cases, the superior vena cava is compressed, leading to SVC syndrome and a patient would present with dyspnea, cough, distended neck veins and facial swelling[4,7,8]. These symptoms are collectively referred to as symptoms of mediastinal obstruction. Patients can also present with vague symptoms such as cough, fatigue and chest pain[1-3,9,10].

The incidence of mediastinal tumors is 43-54% in the anterior mediastinum, 11.4-31.8% in the middle mediastinum and 8.57-26% in the posterior mediastinum[1-4]. On the other hand, the incidence of posterior mediastinal tumors in children is 40%[2]. Our study reports the highest incidence of 69.1% in the anterior mediastinum. Thymomas are the most commonly found in the anterior mediastinum, followed by lymphomas[1,3]. In our study, lymphomas had a similar incidence to thymomas compared to Varizi et al and Adegboye et al studies who found a higher incidence of lymphomas than thymomas[3].

Retrosternal goiters account for 10% of mediastinal masses[4]. In our study, they accounted for 23.6% of mediastinal masses; they appear as continuous with the cervical thyroid gland on CT. As a result, it is difficult to distinguish between benign and malignant goiters[4]. Two resected retrosternal goiters in this series consisted of an incidental finding of papillary thyroid carcinoma. Cysts in the mediastinum could occur at any age and they are usually asymptomatic[5,6]. Thymic cysts account for 3% of anterior mediastinal masses[4]. We found that thymic cysts account for 3.6% of anterior mediastinal masses. They can be congenital or acquired[4,6].

The thymus acts as a primary lymphoid organ and a site for T-cell maturation[2,11]. Thymomas (the cause of which is unknown) are the most common tumors arising from the anterior mediastinum[1-3,11,10]. Thymomas have no gender predilection and can occur at any age, but most commonly between the ages of 30 and 70[1,2,4,10]. In our study, the age of presentation of thymomas ranged from 29 to 61. The thymus undergoes progressive involution as a person grows older, which precludes the high incidence of thymomas in older patients[2,4,11,12,13].

All thymomas in our study were diagnosed based on the presence of both epithelial cells and lymphocytes. The World Health Organization (WHO) set five classifications for thymomas: Types A, AB, B1, B2 and B3. Type C refers to thymic carcinoma[4,10]. Type B3 has a high likelihood of invasion[4]. According to Castleman, a thymoma is not considered malignant unless it metastasizes even if there is local invasion[14]. Thymomas have a tendency to spread locally and potential for malignant transformation, hence it is crucial to resect them surgically[1,2,12,13]. Even after surgical resection, they can recur[13].

Thymolipomas are benign, slow-growing tumors that occur in the anterior mediastinum[4,14]. Less than 10% of thymic lesions are thymolipomas. They are characterized by the presence of abundant adipose tissue in addition to thymic tissue[2,14]. They are common in younger patients with a mean age of presentation of 26.7 years. In our study, two females were diagnosed with a thymolipoma, one was 31 years old and the other was 53 years old. On a CT scan, thymolipomas appears as a mass of fat in the anterior chest. Surgical resection of a thymolipoma is curative with almost no chance of recurrence[2,15]. Both cases in this study underwent a thymectomy.

In this study, one schwannoma was diagnosed. There were more malignant tumors of the mediastinum diagnosed than benign. It is dissimilar to the finding by Adegboye et al and Davis et al[3,4]. Varizi et al and Aroor et al found a higher incidence of malignant tumors compared to benign[3]. In our study, six tumors initially arose from the lung or the chest wall and then metastasized to lymph nodes in the mediastinum.

Lymphoma tends to occur in the first and second decades of life[1]. In this study, Hodgkin's lymphoma (HL) is more common than non-Hodgkin's lymphoma (NHL). Adegboye et al found that NHL was more common than HL[3]. In this study, the youngest patient who presented with a mediastinal tumor was 17 years old and was diagnosed with a Hodgkin's lymphoma. Hodgkin's lymphoma constitutes approximately 50-70% of primary mediastinal lymphomas[1,8]. The most common type of Hodgkin's lymphoma is nodular sclerosing[3,4,16]. Three cases in our study were nodular sclerosing. Diagnosis can be confirmed through immunohistochemistry as Hodgkin's lymphoma stains positive for CD15 and CD30[1,17,18]. Hodgkin's lymphoma can also be diagnosed solely through the detection of Reed-Sternberg (RS) cells on histopathological examination[17]. HL can occur in young patients and adults in their forties[4,19].

In this study, both cases were primary mediastinal large B-cell lymphoma (PMLBCL). Both PMLBCL and Hodgkin's Lymphoma have similar clinical and biological features with minor differences. Sometimes, both types stain positive for CD30[9,16,18]. PMLBCL can be diagnosed through finding diffuse proliferation of large lymphocytes which stain positive for CD19, 20, 22 and 79a. Approximately 47% of PMLBCLs are positive for BCL-6[9, 16].

Thymic carcinoma is rare, constituting approximately 0.06% of thymic neoplasms[2,13,20]. We found one basaloid type thymic carcinoma. Thymic carcinomas have a poor prognosis because they are usually discovered at an advanced stage[2,13].

Liposarcoma commonly occurs in the lower extremities; it rarely occurs in the mediastinum and subcutaneous tissue[4,21]. In this study, one patient was diagnosed with a myxoid liposarcoma of the thymus. Liposarcoma is treated by surgical resection, which was performed on our patient[17]. Teratocarcinomas are mostly found in the anterior mediastinum and are associated with elevated levels of α-fetoprotein and β-HCG[2]. In our study, we found one teratocarcinoma, which was encapsulated and consisted of mature teratoma and yolk sac tumor with sarcomatous spindle cell proliferation. One patient was diagnosed with a superior sulcus tumor, also referred to as Pancoast's tumor. This type of tumor occurs in the apex of the lung and when it reaches an advanced stage, it invades the mediastinal fat or lymph nodes[22].

It is unusual for solitary fibrous tumors (SFTs) to occur in the lung, thyroid, upper respiratory tract and mediastinum[5,23]. Solitary fibrous tumors stain positive for CD34 and negative for S100, which was evident in both cases of our study[23]. One SFT originated in the lung while another originated in the chest wall. Chondrosarcomas are also rarely found in the mediastinum. They mostly occur in the posterior mediastinum[24]. Preoperative diagnosis is difficult; hence, the patient in our study underwent a mediastinoscopy to obtain a tissue sample for histopathological analysis[24]. Two patients presented with metastatic mediastinal tumors with primary tumors originating from structures below the diaphragm. One metastasized from the kidney and the other one from the bladder.

The limitation of this study is that it did not include many cases from the pediatric population, as our center is mainly focused on adult patients. In addition, a small number of cases reflects the small Bahraini population.

CONCLUSION

Thymomas were the most common benign tumors. On the other hand, metastatic tumors were the most common malignant tumors of the mediastinum. It is important to consider mediastinal masses in the list of differential diagnosis in patients who present with dyspnea, chest tightness or dysphagia. The results of this study can be used for comparison purposes in future studies.

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