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Spectrum of Thymic Neoplasms in A Tertiary Care Hospital

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Introduction

The thymus is a primary lymphoid organ of the immune system located in mediastinum. It undergoes several changes as a result of various factors like ageing and medical disorders [1].

Thymic neoplasms constitute a rare group of anterior mediastinal mass which shows heterogeneity in clinical presentation and histologic appearance.

Most patients with thymic tumors are asymptomatic at the time of diagnosis.

Even though diagnosis can be made by clinical course and radiology, biopsy followed by histopathology remains the gold standard for the diagnosis.

Now a day, Immunohistochemistry (IHC) is used as a criteria for diagnosis of thymic neoplasms with ambiguous histology[2].

Materials and Methods

This is a 6 year retrospective study conducted in the Department of pathology on resected and biopsy specimens of thymic neoplasms from 2017 to 2023.

The present study includes 25 cases of thymic neoplasms.

Request forms of the cases were retrieved from the archives to collect available clinical details such as age, gender, symptoms and size of the lesion.

All the microscopic slides were retrieved from the archives and reviewed.

IHCs were done in 6 cases.

Findings were noted in Microsoft excel and analyzed using SPSS V.25.

Number	HPE number	Age	Sex	Symptoms or syndromes	size (cm)	Histology	IHC	EXCISION/BIOPSY
1	5196/17	77	M	MUSCLE WEAKNESS	4x2.9x2	AB	Vimentin,CD3,EMA	BIOPSY
2	5266/17	69	M	DYSPNOEA	10x7.4x3.5	AB		EXCISION
3	5446/17	53	M	DYSPHAGIA	13x5.2x4	B3		EXCISION
4	6321/17	57	F	CHEST DISCOMFORT	6x4x3	AB		BIOPSY
5	7023/17	54	F	CHEST DISCOMFORT	3.9x3.5x3	A	CK7,P63	EXCISION
6	7269/17	63	M	INCIDENTAL	5x3.2x1.4	AB		EXCISION
7	7299/17	72	F	GIDDINESS	4x2.5x1.8	Atypical Carcinoid		EXCISION
8	931/18	31	M	WEIGHTLOSS,HOARSNESS	10.5x9x4.5	Atypical Carcinoid		EXCISION
9	959/18	66	M	CHEST PAIN	0.7x0.3x0.2	MICRONODULAR thymoma		BIOPSY
10	4892/18	29	M	INCIDENTAL	12x9x8	B1		EXCISION
11	6732/18	23	M	BACKPAIN,ARM PAIN	5x2.6x2.5	thymic mucinous adenoca		BIOPSY
12	8296/18	60	F	MYASTHENIA GRAVIS	4x3x1.2	A		BIOPSY
13	1741/19	16	M	DYSPNOEA	13.5x2.4	B3		EXCISION
14	2652/19	55	M	COUGH	9.5x5x3	B1		EXCISION
15	2834/20	18	M	WEAKNESS	5x4x1.5	AB		EXCISION
16	1159/21	68	M	INCIDENTAL	10.5x9x4.5	AB	TdT	EXCISION
17	301/21	52	F	COUGH	13x7.2x1.9	A	P63,CD20,CK7,KI67	BIOPSY
18	889/21	64	F	INCIDENTAL	3.8x3.5x2	B2	PAN CK ,CD20	BIOPSY
19	2243/21	65	M	CHEST PAIN	9x7.8x5.2	B3		EXCISION
20	3162/21	36	M	MYASTHENIA GRAVIS	4.5x4.5x1	B2		BIOPSY
21	4565/21	55	M	COUGH	15x12	AB		EXCISION
22	6444/21	42	F	CHEST DISCOMFORT	14.5x10.5x6	AB		EXCISION
23	5298/22	38	F	MUSCLE WEAKNESS	10x7x3	AB		EXCISION
24	4305/23	73	F	COUGH	2.5x2.3x1.9	A		BIOPSY
25	3412/23	38	M	COUGH	6x5.4x2	A	PANCK,CD3,TdT,KI67	EXCISION

Results

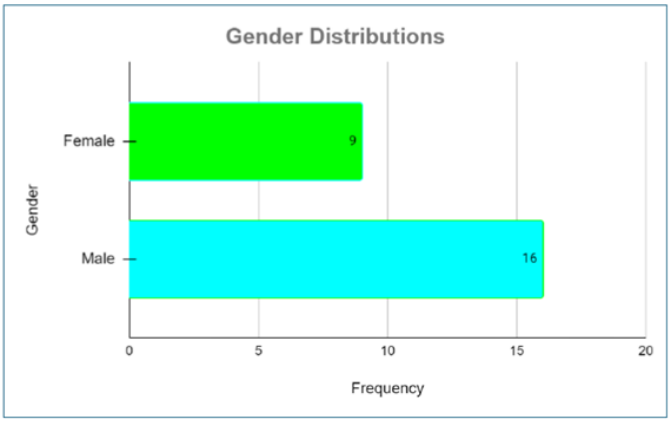
Among 25 thymic neoplasm cases, male predominance was observed which consist of 16 cases (64%) with a male-to-female ratio of 1.78:1

The most affected age group is 61-80 years (36%)

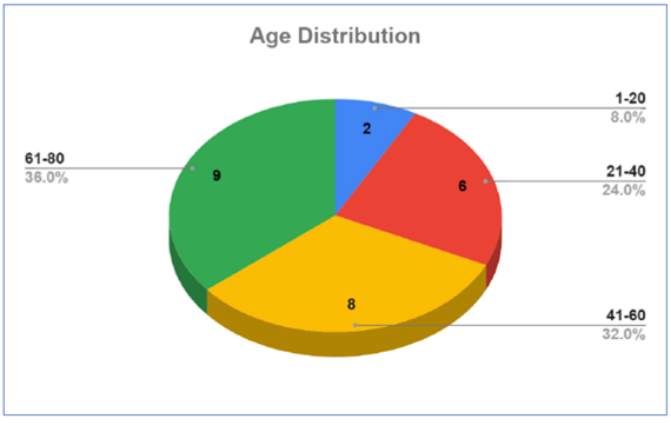
Thymomas constitute majority of the diagnoses followed by atypical thymic carcinoid tumors.

Myasthenia gravis was associated with 2 (8%) cases

Graph 1:



Graph 2:



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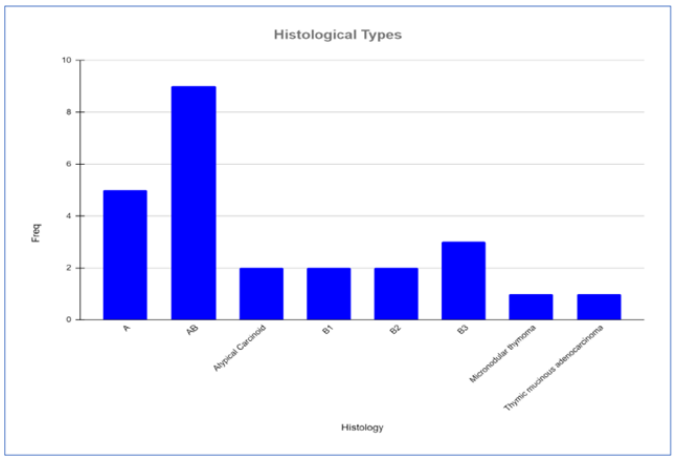

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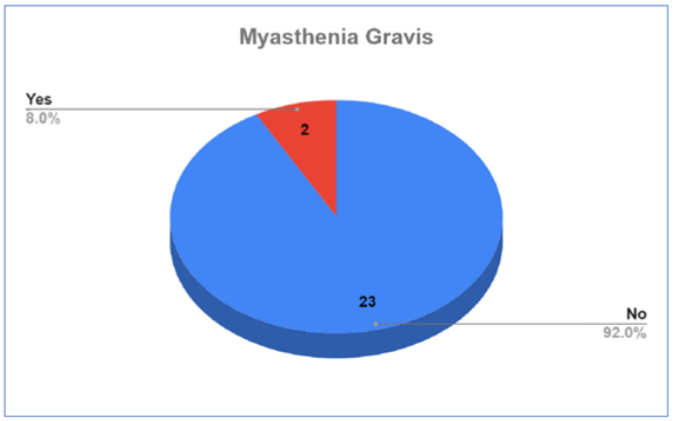
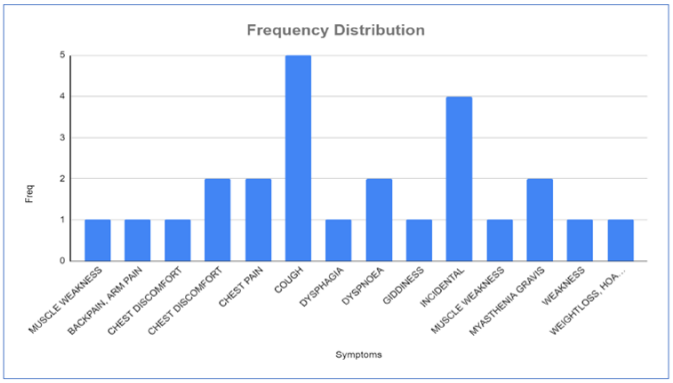


Graph 5:



The symptoms reported by the patients vary, with "Cough" being the most common, occurring in 20% of the cases. Other notable symptoms include "Incidental" findings (16%), "Chest Pain" (8%), "Chest Discomfort" (8%), "Dyspnoea" (8%), and "Myasthenia Gravis" (8%).

Discussion

Thymic neoplasms are most common mass of anterior mediastinum. It frequently exhibit histologic heterogeneity, making it difficult to distinguish between benign and malignant tumours only on the basis of their medical history [3]

In our study, slight male predominance was observed which was consistent with literature [4]

Nearly 56% patients had compressive symptoms and two cases had history of myasthenia gravis which is commonly associated with thymoma. In our study, thymoma constituted majority (88%) of the cases followed by exceedingly rare tumors like atypical thymic carcinoid tumor (8%) and Thymic carcinoma (4%). Two cases of atypical carcinoid tumors presented with non specific symptoms. Similar observation was appreciated by shan Zhu[5].Histology showed tumour cells in classical organoid pattern and nests separated by fibrovascular septa with occasional mitosis.

Extremely rare and aggressive variant of thymic carcinoma noted in our study was primary thymic mucinous adenocarcinoma which presented with large mediastinal mass extending to middle and posterior compartments. IHC results: Positive: CD20, CDX2 and CD5 Ki-67 labelling index: 40-50%, Negative: CK7, TTF1, Napsin A, GCDFP-15. This was similar to a study by Yu Zhang [6]

Most common histological variant among thymoma was Type AB followed by Type A, B3, B1 and B2

Type AB thymomas combine both a lymphocyte-rich (type B-like) and a lymphocyte-poor (type A-like) component.

Type A showed predominantly spindle and oval shaped cells with bland nuclei, finely dispersed chromatin and inconspicuous nucleoli with no lymphocytes.

Another histological subtype of thymoma noted was micronodular thymoma showing well-formed fibrous capsule with nodules of epithelial cells, elongated nuclei and scant cytoplasm.

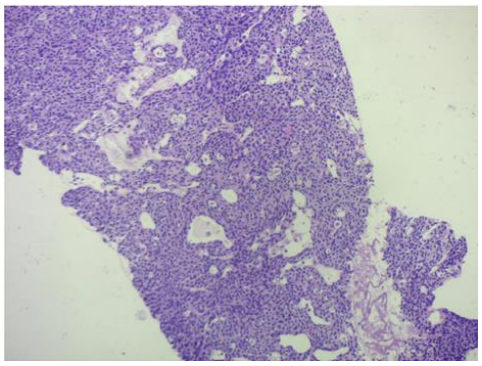


Figure 1: Thymoma Type A (H&E, 4x magnification)

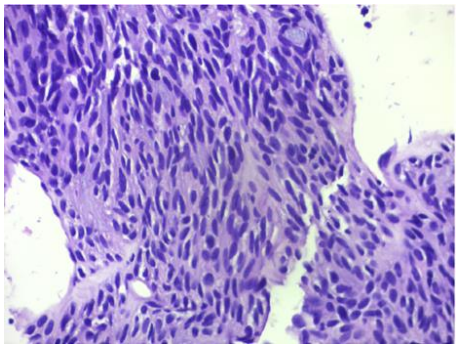


Figure 2: Thymoma Type A (H&E, 40x magnification)

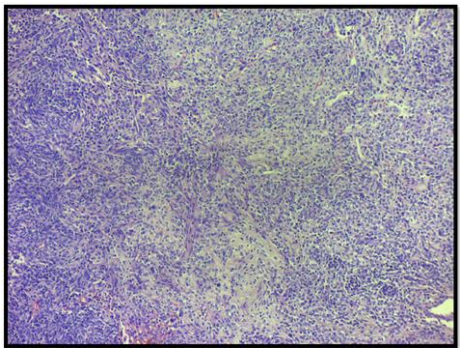


Figure 3: Type AB Thymoma (H&E, 10X magnification)

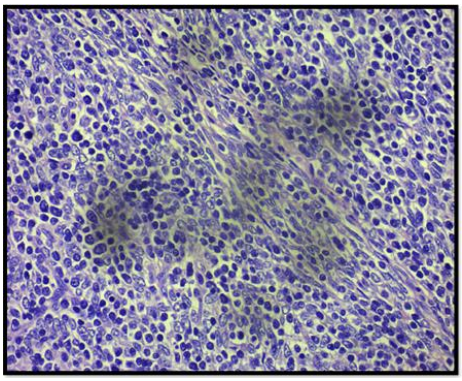


Figure 4: Type AB Thymoma (H&E,40x magnification)

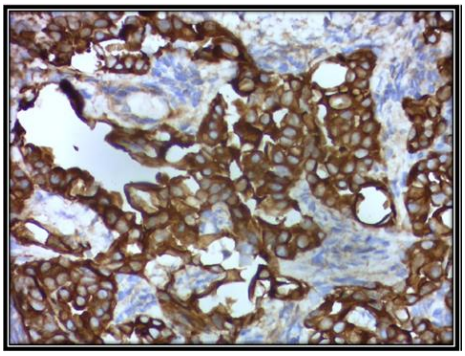


Figure 5: Pan CK (40x magnification)

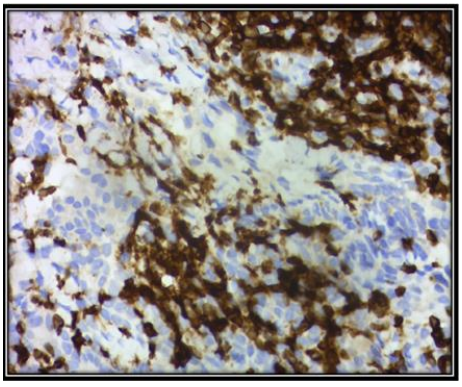


Figure 6: CD3 (40x magnification)

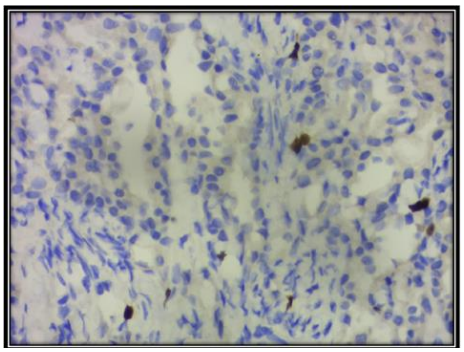


Figure 7: KI 67 (40x magnification)

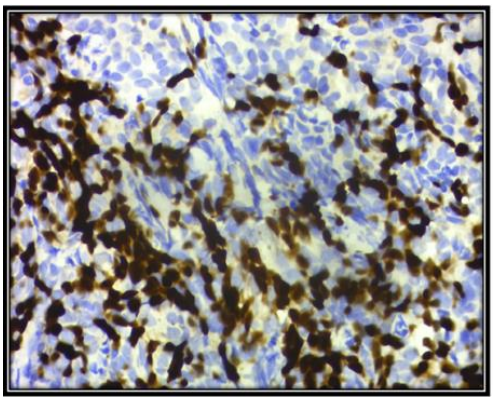


Figure 8: TDT (40x magnification)

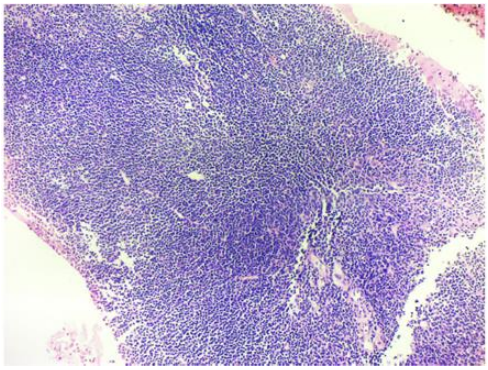


Figure 9: B2 thymoma (H&E, 10x magnification)

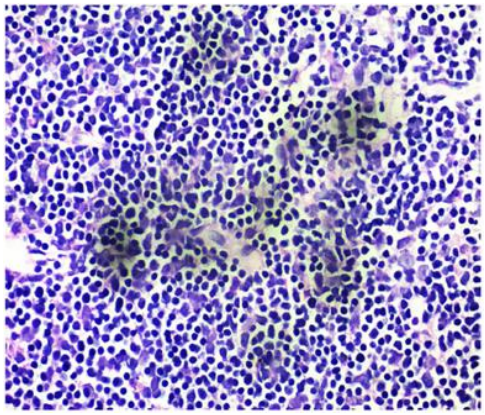


Figure 10: B2 thymoma (H&E, 40x magnification).

Conclusion

Histopathology in thymic neoplasm is an important diagnostic tool to know the spectrum of various thymic lesions, in understanding the pathogenesis, to assess the various morphological pattern of the same disease, before multimodality therapy is started. IHC can be done to distinguish classification of thymoma and thymic

carcinomas and are indispensable in academic and research purposes.

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