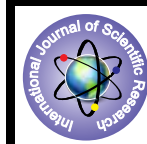


## Spindle cell tumor of thyroid in a child: A diagnostic dilemma



### Medical Science

KEYWORDS : spindle cell tumor, thyroid tumor, medullary carcinoma, mesenchymal tumor

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### ABSTRACT

*Objective:- FNAC of the thyroid is commonly done for solitary thyroid nodule. These solitary thyroid lesions may be goitre or neoplastic lesions. Rarely FNAC of a thyroid swelling may be challenging.*

*Methods:- A 8 year male child presented with thyroid swelling. USG was done which showed mass in the thyroid. FNAC was done and cell block was made.*

*FNAC smears were cellular and showed large fragments and scattered spindle cells with central nuclei in many cells. Immunohistochemistry was done and it showed diffuse and strong positivity for vimentin.*

*Results:- Based on these findings a diagnosis of spindle cell tumor probably of mesenchymal origin was made and biopsy was advised.*

*Conclusion:- Spindle cell tumor of thyroid includes a long list of tumor including medullary carcinoma and mesenchymal tumors and sometimes it can be very difficult to diagnose it on FNAC smear. Histopathological and Immunohistochemistry examination should be done on these cases to confirm the diagnosis.*

### INTRODUCTION

Thyroid is a common site for FNAC of any enlarged nodularity having sensitivity and specificity upto 94% and 98% for diagnosis of malignant lesions. The usual diagnosis are benign thyroid aspirate like colloid goitre or inflammatory diseases like Hashimoto thyroiditis or various neoplastic lesions.

For interpretation of thyroid FNAC, Bethesda guidelines have been developed and is described as:

- I. Nondiagnostic or Unsatisfactory
- II. Benign
- III. Atypia of Undetermined significance or Follicular lesion of undetermined significance
- IV. Follicular neoplasm or suspicious for a Follicular neoplasm
- V. Suspicious for malignancy
- VI. Malignant (Papillary Ca, Follicular Ca, Medullary Ca, Anaplastic Ca, Lymphoma)

Rarely, thyroid FNAC may show unusual morphological features like spindle cells which may be predominant cell population and can lead to diagnostic confusion.

Spindle cells can be seen in thyroid in various conditions including Primary thyroid neoplasms, Mesenchymal neoplasms and Reactive conditions.

Here we describe cytomorphological features of one such case in a child showing predominance of spindle cells in thyroid FNAC with correlation by immunohistochemical findings on cell block material.

### CASE REPORT:

A 8 year male child presented with massively enlarged thyroid swelling of size 8.5x5 cm (Fig. 1) since last two and half years. No other abnormality associated with any syndrome like MEN2B (Mucosal neuroma, Musculoskeletal abnormality) was found. The swelling was gradually increasing in size. No other complaint was present. USG was done which showed mass in the thyroid (Fig.

2). FNAC was done using 23 gauge needle air-dried and alcohol fixed smears and cell block was made.

FNAC smears were cellular and showed large fragments and scattered spindle cells (Fig. 3,4) with central nuclei in many cells and focal clusters of round to oval epithelioid cells having moderate cytoplasm with vague formation of acinar structure (Fig. 5). Few scattered mitosis seen however no nuclear atypia was present (Fig. 6). Cytoplasmic granules were absent. Cell block slide also showed fragments of spindle cells (Fig. 7,8). Immunohistochemistry was done and it showed diffuse and strong positivity for vimentin (Fig. 9) and was negative for cytokeratin, chromogranin, S-100 and CD34 and desmin.

### DIAGNOSIS

Based on these findings a diagnosis of spindle cell tumor probably mesenchymal in origin was suggested and biopsy was advised.

### DISCUSSION:

Spindle cells can be seen in various thyroid lesions and rarely they can be predominant cell population. The various conditions include Reactive conditions like Riedel thyroiditis, and neoplastic conditions like primary thyroid parenchyma tumors and mesenchymal tumors.

The Primary thyroid parenchymal tumors which show spindle cells include papillary carcinoma, medullary carcinoma, spindle epithelial tumor with thymus-like differentiation (SETTLE), carcinoma showing thymus like differentiation (CASTLE), follicular dendritic cell tumor (FDCT). Various mesenchymal tumors include solitary fibrous tumor (SFT), muscle tumors, peripheral nerve sheath tumor (PNSTS).

The various neoplastic conditions can be differentiated on clinical, morphological, immunohistochemical and molecular features as described below:

Differential diagnosis	Clinical features	Cytomorphological/Histopathological features	Immunohistochemistry	Molecular Profile
1.Papillary Carcinoma	Predominantly in female Third to fifth decade	-Cellular smear composed of round to spindle shaped cells -Intranuclear creases,grooves, and cytoplasmic invaginations(pseudoinclusions)	Positive for thyroglobulin,TTF-1,EMA,cytokeratins,vimentin.	Chromosomal rearrangements of <i>ret</i> gene
2.Medullary Carcinoma	Slight female predilection Age group:40-50 year Familial form(MEN2A/MEN2B) of MTC affect younger patients.	-Hypercellular smear -Non-cohesive clusters of spindle cells -Eccentric nuclei with coarsely granular chromatin -Intracytoplasmic red granules	Positive for cytokeratins,neuron-specific enolase,synaptophysin,CEA,cromogranin A,calcitonin.	RET proto-oncogene mutation
3.SETTLE	Predominantly in children,adolescents and young adults.	-Clusters of spindle cells in groups. -Biphasic epithelioid and spindle cell population -Distinct cell borders and scant cytoplasm -Uniform,elongated, cigar shaped nuclei containing fine and dispersed chromatin	Positive for Vimentin,cytokeratins and smooth muscle actin	
4.Neural tumor	Rare,Mainly in adults	-FNAC usually not helpful -Scattered spindle cells in a bloody background	-Strong positive for S-100 and vimentin.	
5.SFT	-In adults only -No sex predilections	-Haphazard distribution of spindle, fibroblast-like cells -round to oval and elongated to spindle shaped nuclei contain fine dispersed chromatin and weak eosinophilic cytoplasm	Positive for bcl-2,CD34,CD99,vimentin.	
6.Smooth muscle tumor(SMT)	-Benign(leiomyoma) or malignant (leiomyosarcoma) -Leiomyoma affect younger patients while leiomyosarcomaduring sixth decade	Variable number of atypical spindle cell in malignant SMT.	Benign and malignant SMT are positive for vimentin,SMA,muscle specific actin and desmin.	
7.Synovial sarcoma		-Biphasic tumor showing spindle cell and epithelial cell -Epithelial cell-ovoid cell and abundant cytoplasm -Spindle cell-uniform spindle cells with small ovoid nuclei and small nucleoli	90% cases positive for cytokeratins in epithelial component.	Chromosomal alteration t(x;18)(p11;q11)

Abbreviations:SETTLE-Spindle epithelial tumor with thymus-like differentiation, SFT-solitary fibrous tumor,MTC-Medullary thyroid carcinoma,SMT-smooth muscle tumors,SMA-smooth muscle actin

**CONCLUSION:**

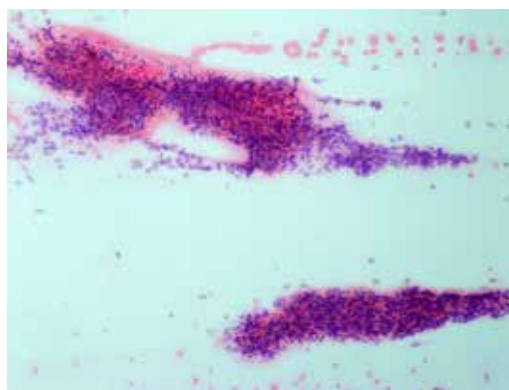
In the present case both cytology and cell block showed predominance of spindle cells in large fascicles with focal epithelioid like cells forming vague acinar structures. No cytoplasmic granularity was seen and since the patient was a child, a possibility of Spindle epithelial tumor with thymus like differentiation(SETTLE) was also considered but CK was negative. Based on these findings mesenchymal tumor was suggested and biopsy was advised to exclude other primary thyroid tumors like medullary carcinoma.



**Fig.1 : Large neck mass in a child**



**Fig 2.Ultrasound showing solid and cystic area in thyroid**



**Fig 3.Fascicles of spindle cells (Pap) 10X**

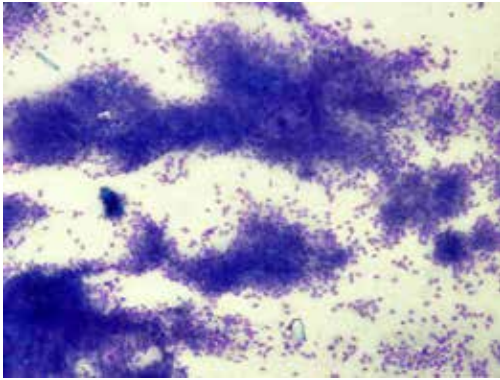


Fig 4.Fascicles of spindle cells (Giemsa) 10X

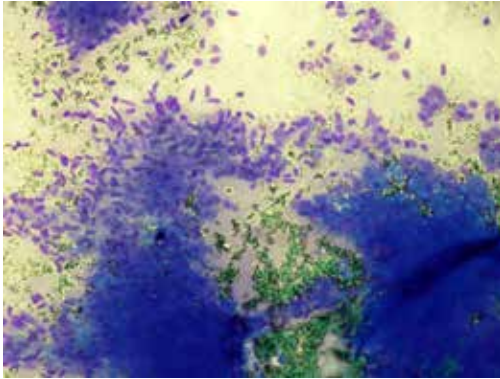


Fig 5. Spindle cells with epithelioid cells forming vague acinar structures (Giemsa) 20X

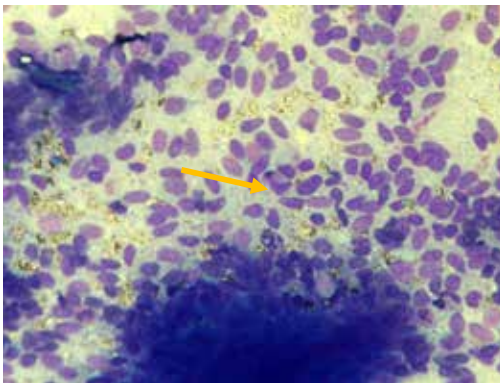


Fig 6.Giemsa stain showing mitosis and agranular cytoplasm 40X

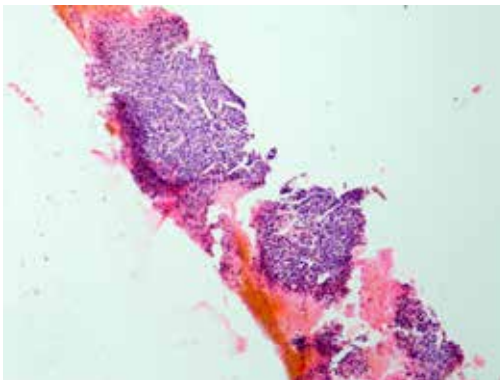


Fig 7.Cell block showing fragments of spindle cell in blood clot 10X

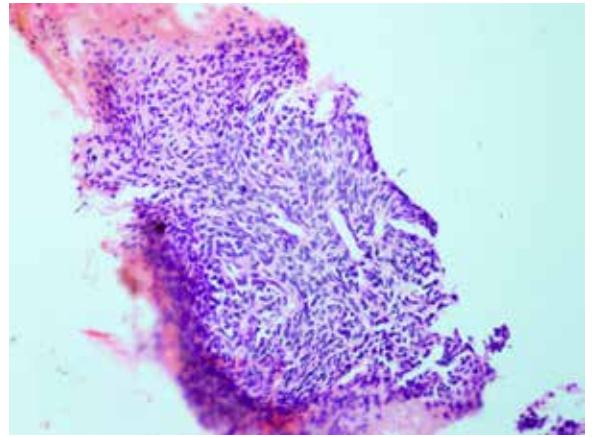


Fig 8. Cell block showing fragments of spindle cells 20X

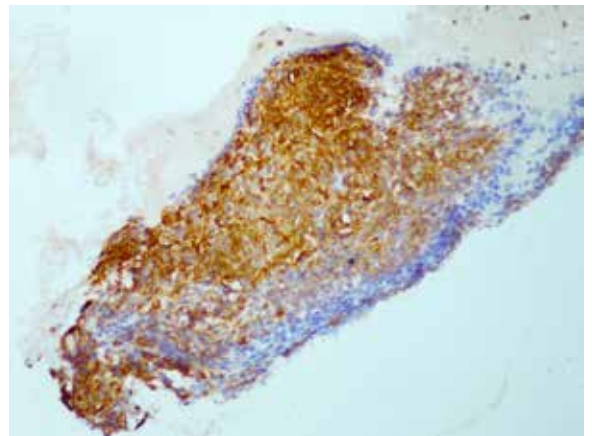


Fig 9.Spindle cells showing diffuse and strong positivity for vimentin 20x

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