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Case Report

Pathology Section

Inflammatory Myofibroblastic Tumour of Thyroid with its Prominent Spindle Cell Pattern: A Rare Case Report

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ABSTRACT

Inflammatory myofibroblastic tumour of thyroid is very rare. Only 18 cases reported so far. Here we report a case of Inflammatory myofibroblastic tumour with its prominent spindle cell (fibrohistiocytic) pattern in a 61-year-old male patient. The dominant histological pattern in our case was myofibroblastic in contrast to prominent lymphoplasmocytic pattern in other previously reported cases. The tumour was strongly positive for vimentin, Anaplastic lymphoma kinase and showed focal positivity for Smooth Muscle Actin. The patient was treated with total thyroidectomy and he is comfortable after surgery.

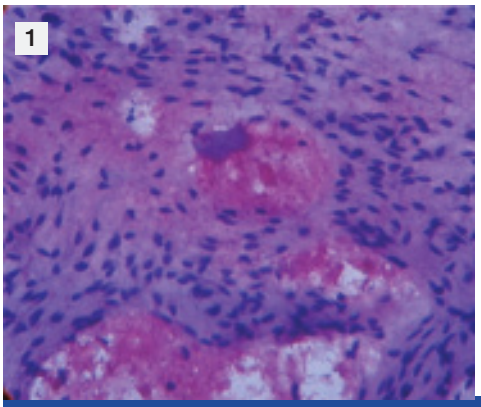
Keywords: Anaplastic lymphoma kinase, Immunohistochemistry, Lymphoplasmocytic

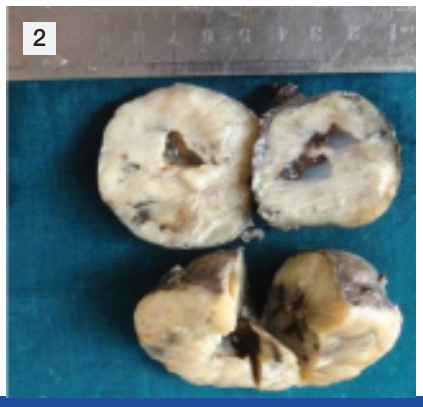
CASE REPORT

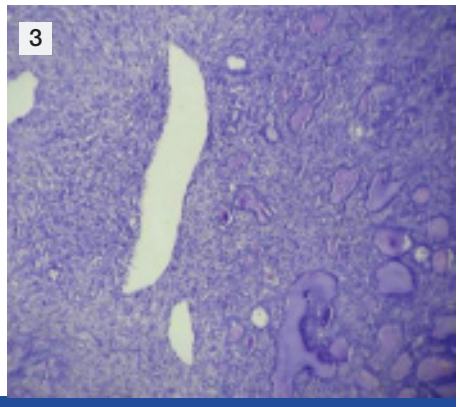
A 61-year-old male patient presented with painless thyroid swelling for 2 years duration. He was clinically euthyroid and his thyroid profile was normal. Ultrasound showed hypo echoic thyroid mass in the right lobe with cystic degeneration. FNAC [Table/Fig-1] was done in both lobes. Aspirates from the right lobe showed features of adenomatous changes and in left lobe, benign spindle cells with bland appearing nuclei. FNAC diagnosis was adenomatous hyperplasia with spindle cell proliferation and suggested thyroidectomy to rule out medullary carcinoma thyroid in view of spindle cell proliferation. Hence the patient was subjected to total thyroidectomy.

Grossly [Table/Fig-2], total thyroidectomy specimen was measuring 9x4x3cm, external surface was smooth and the cut surface showed gray white firm areas with focal cystic change, diffusely involving the entire thyroid specimen. There was no normal thyroid tissue. Tissue sections were routinely processed and stained with Haematoxylin and Eosin.

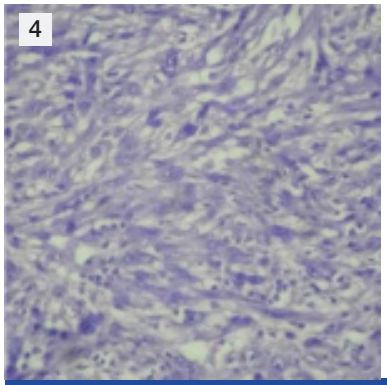
Histopathology [Table/Fig-3] sections studied from both lobes of thyroid showed spindle cell proliferation arranged in fascicles and short whorls surrounding the normal appearing thyroid follicles. The spindle cells [Table/Fig-4] were plump with elongated nuclei. Occasional lymphocytes, histiocytes and plasma cells were seen interspersed among the spindle cells. Some of the cells [Table/Fig-5] were bizarre appearing with atypical nuclei. Mitotic figures were rare. Few giant cells were seen scattered. There was no necrosis. Spindle cell neoplasm of thyroid was considered and the differentials of Medullary

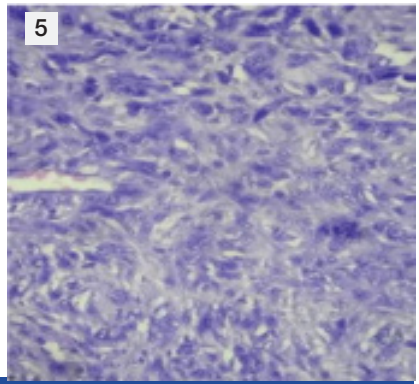




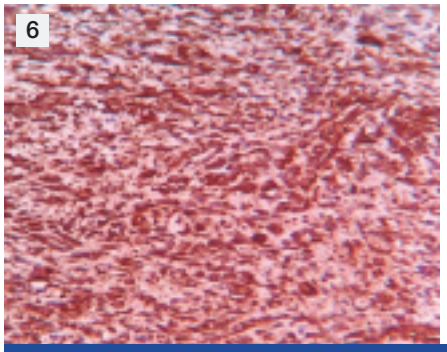


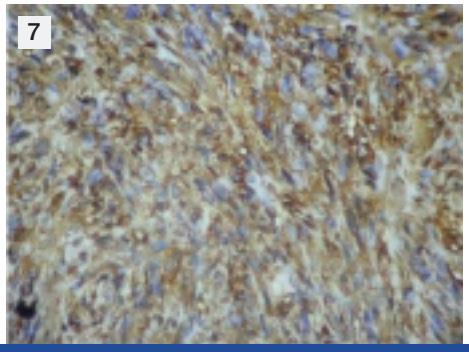
[Table/Fig-1]: H&E (10 x)- Benign spindle cells with bland nuclei on cytological examination. **[Table/Fig-2]:** Thyroid parenchyma with gray white areas and focal cyst formation. **[Table/Fig-3]:** H&E (10x)-Spindle cell proliferations surrounding the thyroid follicles with focal cystic spaces.

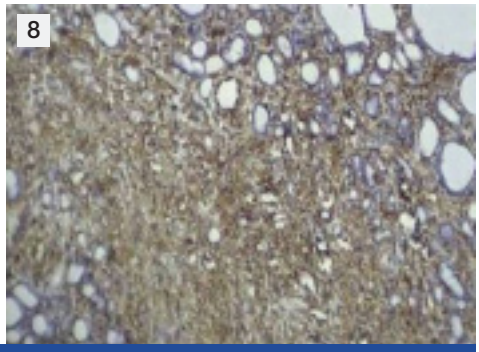




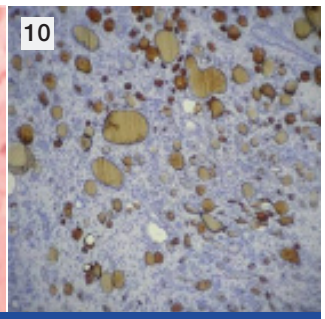
[Table/Fig-4]: H&E (40x)-Plump spindle cells having bland nuclei with lymphocytes, histiocytes and few plasma cells in the background. **[Table/Fig-5]:** H&E (40x)-Spindle cells with indistinct cell borders, moderate cytoplasm and vesicular nuclei. Also, scattered bizarre cells showing irregular nuclei and giant cell formation.







[Table/Fig-6]: IHC(40x)-Cytoplasmic positivity of Vimentin in spindle cells. **[Table/Fig-7&8]:** IHC (10X and 40X)- ALK-1 positivity in the cytoplasm of the spindle cells.



[Table/Fig-9]: IHC(40x)-Cytoplasm SMA positivity in focal areas and in few dispersed spindle cells. **[Table/Fig-10]:** IHC(10x)- Thyroglobulin cytoplasmic positivity in the follicles and negativity in spindle cells.

carcinoma thyroid/Spindle Epithelial Tumour with Thymus Like Differentiation (SETTLE) was given. Clinically there was no extra thyroidal involvement.

Immunohistochemistry [Table/Fig-6-10] was done with thyroglobulin, calcitonin, TTF-1, cytokeratin to rule out the possibility of spindle cell variants of papillary thyroid carcinoma, medullary carcinoma and anaplastic carcinoma, and they were negative. Vimentin [Table/Fig-6] was strongly positive; SMA [Table/Fig-9] was focally positive exhibiting myofibroblastic differentiation. CD34, S100, EMA were negative hence ruled out solitary fibrous tumour and MPNST. Anaplastic lymphoma kinase-ALK-1 [Table/Fig-7,8] was positive. Hence we diagnosed this lesion as inflammatory myofibroblastic tumour.

The patient was doing well after one year of surgical resection of this tumour.

DISCUSSION

Inflammatory myofibroblastic tumour is a rare spindle cell neoplasm characterized by spectrum of myofibroblastic proliferation along with varying amount of lymphoplamocytic infiltration. It was first observed and described by Brunn in1939 [1]. It was named as inflammatory myofibroblastic tumour by Umikar et al., because it was resembling a malignant tumour clinically, radiologically and histopathologically [2]. It is otherwise called as inflammatory pseudo tumour, plasma cell granuloma and plasma cell pseudotumour. Inflammatory myofibroblastic tumour commonly occurs in lung, liver and GIT.

Incidence of Inflammatory myofibroblastic tumour in thyroid is very low and only 18 cases have been reported so far in English literature [Table/Fig-11] [3-20]. There are four histological patterns described [21].

a. Dominant lymphoplasmocytic pattern,
b. Dominant lymphohistiocytic pattern,
c. Prominent young and active myofibroblasts. (spindle cell or fibrohistiocytic),
d. Predominantly collagenized process with lymphocytic inflitrate. (sclerosing).

All of the reported cases were most commonly in women and they were all exhibiting the prominent lymphoplasmocytic pattern

Name of the study year	Age of the patient	Clinical features	Function of thyroid	Histological pattern
Holck et al., (1980) [3]	70/f	Postural dyspnoea	hypothyroid	Lymphoplasmocytic
Yapp et al., (1984) [4]	61/f	Asymptomatic	hypothyroid	Lymphoplasmocytic
Chan et al., (1986) [5]	35/f	Firm thyroid nodule	Euthyroid	Lymphoplasmocytic
Talmi et al., (1988) [6]	51/f	Slowly enlarging painless mass	Not reported	Lymphoplasmocytic
De Mascard et al., (1989) [7]	55/f	Thyroid swelling	Not reported	Lymphoplasmocytic
Zingrillo et al., (1995) [8]	65/f	Asymptomatic Neck swelling	hypothyroid	Lymphoplasmocytic
Livoon chong et al., (2001) [9]	29/m	Dysphagia with DM and hard mass in thyroid	Not reported	Lymphoplasmocytic
Martinez et al., (2002) [10]	46/f	Nodular swelling	Euthyroid	Lymphoplasmocytic
Mugler et al., (2003) [11]	46/m	Hashimoto's Thyroiditis	hypothyroid	Lymphoplasmocytic
Ferrer GaArcialt et al., (2004) [12]	41/m	Goitre	hypothyroid	Lymphoplasmocytic
Lauren et al., (2004) [13]	35/f	Dysphagia with hashimoto's	hypothyroid	Lymphoplasmocytic
Kriegl et al., (2007) [14]	50/m	Dysphagia with hashimoto's	hypothyroid	Lymphoplasmocytic
Fontenot et al., (2008) [15]	58/f	Enlarging neck swelling	hypothyroid	Lymphoplasmocytic
Trimeche et al., (2009) [16]	18/f	Goitre	hypothyroid	Sclerosing
Kojima et al., [17] (2009) #	75/f	Painless neck swelling	euthyroid	Fibrohistiocytic
Barber et al., (2010) [18]	89/f	Goitre	hypothyroid	Lymphoplasmocytic
Anne cremonini et al., (2012) [19]	85/f	Goitre		Lymphoplasmocytic
HyeJeongKim et al., (2014)* [20]	50/f	Painless mass	euthyroid	Fibrohistiocytic
Present case*	61/m	Goitre	euthyroid	Fibrohistiocytic

[Table /Fig-11]: List of previously reported cases as plasmacell granulomas. # first case reported as fibrohistiocytic variant.*only three cases (including the present case) were reported as inflammatory myofibroblastic tumor fibrohistiocytic(spindle cell) variant.

except for two cases one showing prominent fibrohistiocytic pattern [17]. Our case showed the third pattern with prominent young and active myofibroblasts (fibrohistiocytic).

Clinically the patients usually present with painless enlargement of thyroid, but with only dysphagia in few cases. It can be associated either with hypothyroidism or with euthyroid status. Cases have been reported with hashimoto's thyroiditis and with goitre [12]. It can even present as diffuse lesion involving the whole thyroid or as circumscribed masses. One case have been reported as hard mass mimicking malignancy [9].

Inflammatory myofibroblastic tumour is considered as a reactive process for an underlying infection or chronic inflammation. Recent studies identified chromosomal abnormalities in pulmonary and extrapulmonary inflammatory myofibroblastic tumour supporting the neoplastic nature of this lesion.They involve the anaplastic lymphoma kinase gene located in chromosome 2p 21-24 [22].

Macroscopically they are gray white or gray tan and firm in consistency, gritty when there is calcification. It can have a diffuse involvement also, like our case.

Spindle cell pattern with young myofibroblasts is very rare in thyroid only two cases reported previously. Rest of them were lymphoplasmocyte rich and they were polyclonal in nature and these plasma cells were positive for IgG4 [23].

This spindle cell variant due to its pleomorphism and giant cells can mimic the spindle cell variant of papillary carcinoma thyroid, medullary carcinoma or anaplastic carcinoma of thyroid and SETTLE. We exclude the possibility of these malignant tumours by immunohistochemical markers – thyroglobulin, calcitonin cytokeratin, chromogranin, TTF-1 where all of these markers found to be negative. Calcifying fibrous pseudotumour and solitary fibrous tumour can have the similar morphology but it will be CD34 positive. In our case it was also negative. We also excluded the possibility of other mesenchymal tumours like MPNST, Synovial sarcoma by S100, EMA which were negative.

Inflammatory myofibroblastic tumours will be strongly positive for vimentin and focally positive for SMA in cells with myofibroblastic differentiation. Anaplastic lymphoma kinase -1 and p80 will be expressed in 36-60% of cases and they can be used in differentiating from other mesenchymal tumours [22]. ALK-1 was positive in our case.

Recent studies suggest that ALK over expression is associated with aggressive behaviour [24]. Though inflammatory myofibroblastic tumour are usually indolent, few case reports are available suggesting recurrence and malignant counterpart [25].

CONCLUSION

IMT has to be considered in spindle cell lesions of thyroid and clinician should be aware of recurrence and possible malignant behaviour in rare occasions. More studies are necessary to establish their neoplastic nature of this rare tumour and the therapeutic significance of ALK-.1.

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