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RESEARCH ARTICLE

FOLLICULAR ADENOMA THYROID WITH CLEAR CELL CHANGES- A RARE CASE REPORT.

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Abstract

Follicular lesions in thyroid nodule are common findings while investigating them by fine-needle aspiration cytology (FNAC). Histologically, these lesions may represent a cellular nodule in a goiter, a follicular adenoma, or a carcinoma. Cellular changes that occur in clear cytoplasm in thyroid lesions are caused by glycogenation, intracellular accumulation of thyroglobulin, dilatation and hypertrophy of mitochondrial cells and golgi complex hypertrophy which is due to excessive secretion of Thyroid stimulating hormone (TSH). A 28 year female, housewife, presented with a gradually increasing swelling in midline of neck since 2 years. On examination, swelling was present on anterior border of sternocleidomastoid, 3x2cm in size, oval and with diffuse margins. It was non-tender, moved on deglutition, non-reducible and transillumination negative. The patient had normal thyroid functions with free T4 and TSH within normal range. No capsular or vascular invasion was seen. A diagnosis of Clear cell Follicular adenoma thyroid was made. Pure Follicular adenomas are the common lesions of thyroid and arise from follicular epithelium. They are usually single and well-encapsulated lesions. These lesions are more common in females and are mostly benign. Any thyroid lesion with clear cell features warrants further histopathological assessment as clear cell changes are not appreciated in cytological smears. Our case presents the pathology of pure clear cell Follicular adenoma which is rarely seen.

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Introduction:-

Follicular lesions in thyroid nodule are common findings while investigating them by fine-needle aspiration cytology (FNAC). Histologically, these lesions may represent a cellular nodule in a goiter, a follicular adenoma, or a carcinoma. According to growth pattern, several variants exist such as follicular, trabecular, solid and also according to cell types variants are common, oxyphilic, and clear cell type. Clear cell changes in thyroid lesions can be seen in wide variety of non-neoplastic and neoplastic thyroid lesions. These include Hashimoto thyroiditis, Dysmorphogenetic goitre, variants of Follicular adenoma, Follicular carcinoma, Papillary carcinoma, Clear cell variant of medullary carcinoma, Signet ring lipoblast like tumors and undifferentiated tumors. However, non thyroid lesions can also mimic clear cell changes like Parathyroid neoplasm, metastatic Renal cell carcinoma and rarely artefact of formalin fixation or paraffin embedding procedure. Therefore, a clear cell change in a thyroid lesion should always be interpreted with caution and a thyroglobulin stain is essential for diagnosis. Cellular changes that occur in a clear cytoplasm in thyroid lesions are caused by glycogenation, intracellular accumulation of thyroglobulin, dilatation and hypertrophy of mitochondrial cells and golgi complex hypertrophy which is due to

excessive secretion of Thyroid stimulating hormone(TSH) ¹. Clear cell changes have been described in many reported cases of thyroid lesion but clear cell adenoma are very rare.

Case history:-

A 28 year female, housewife, presented with a gradually increasing swelling in midline of neck since 2 yrs. There is history of increased sweating, decrease in weight and heat intolerance for the last 2 months. There is no history of tremors in hand, difficulty in breathing, restlessness, easy fatiguability or any addictions. There is also no history of similar complaints in any of the family members.

On examination, swelling was present on anterior border of sternocleidomastoid, 3x2cm in size, oval and with diffuse margins. It was non-tender, moved on deglutition, non-reducible and transillumination negative. The patient had normal thyroid function with free T4 and TSH within normal range. On ultrasonography, findings were suggestive of Benign thyroid nodule in left thyroid lobe with left Thyromegaly. Cytological findings were consistent with a neoplasm and Left Hemithyroidectomy was performed. Grossly, hemithyroidectomy specimen measuring 6x3x1 was received. Cut surface showed a well circumscribed tumor with a smooth, thin capsule and a soft consistency. Rest of the areas were pale brown with foci of hemorrhage. Microscopically, sections showed encapsulated tumor composed of variable sized follicles. These follicles at places were lined by cuboidal cells with lumen showing eosinophilic homogenous colloid. Few areas of these follicles showed scalloping, whereas other predominant areas showed closely packed small follicles lined by cells having round to oval nucleus and clear cytoplasm. Areas of haemorrhage and fibrosis were seen. Pericapsular area showed compressed normal thyroid tissue. No capsular or vascular invasion was seen. A diagnosis of Clear cell Follicular adenoma thyroid was made.

Discussion:-

Pure Follicular adenomas are common lesions of thyroid and arise from follicular epithelium. They are usually single and well-encapsulated lesions. These lesions are more common in females and are mostly benign. Thyroid function tests of most of these patients come out to be euthyroid. Approximately 1% of follicular adenomas are toxic adenomas which cause symptomatic hyperthyroidism. Hyperthyroidism usually does not occur until a functioning follicular adenoma is more than 3 cm in size. A follicular carcinoma cannot be distinguished from adenoma on the basis of cytologic features alone. It is distinguished on the basis of capsular invasion, vascular invasion, extrathyroidal tumor extension, lymph node metastasis or systemic metastasis. A follicular neoplasm with tumor invasion but not through entire capsule is considered follicular adenoma. Vascular invasion is defined as tumor penetration into large calibre vessel within or outside the capsule. Most reliable sign of malignancy is vascular invasion. Pure clear cell lesions of thyroid gland are rare and prone to pose several diagnostic challenges. Metaplastic changes in follicular cells in thyroid are squamous, oncocytic and occasionally clear cell. Most commonly secondary clear cell changes are seen in Hurthle cell tumor, which is a result of vesicular swelling of mitochondria². Oxyphilic and clear cell changes can be seen in different regions of same cell or in cells facing each other³. Clear cell changes are seen in, Follicular adenomas and carcinomas⁴, Follicular adenoma associated with McCune-Albright syndrome⁵ show clear cell changes due to uncontrolled fatty chain synthesis, Papillary carcinoma⁶, Undifferentiated carcinoma and Medullary carcinoma⁷. Thyroglobulin stain is usually positive in all these neoplasms except Medullary carcinoma, although sometimes in a focal and faint fashion⁸. Although clear cell change in a follicular neoplasm is not an indication of malignancy but as it occurs more frequently in carcinomas than adenomas, it should be viewed with suspicion when present. In Papillary carcinoma and undifferentiated carcinoma the clear cell cell changes are due to cytoplasmic glycogen. CT scans and MRI scans are important in these lesions as they detect spread to local, mediastinal and regional lymph nodes. But it is still to be evaluated that follicular nodules have potential to develop carcinoma or not. Signet ring cell type is a peculiar variant of thyroid tumor with clear cell changes in which signet ring cells or lipoblasts are due to formation of variously sized cytoplasmic vacuoles. Most of these lesion are adenomas but rarely carcinomas may also occur⁹. Rarely, clear cell change is seen in lipid-rich cell adenoma, where accumulation of neutral fat results in cytoplasmic vacuolation¹⁰. Cytoplasmic clear cell changes are also seen in dysmorphogenetic goiter and hashimoto's thyroiditis which are non-neoplastic thyroid disorders¹¹. Main differential diagnosis of primary thyroid tumors with clear cells change is with Metastatic Renal cell carcinoma¹² and Parathyroid neoplasms. Both of these lesions can be intrathyroidal and also thyroid clear cell tumors can occur in ectopic locations¹³. Incidence of true intrathyroidal parathyroid tissue is estimated as 0.2% approximately and if these parathyroid glands have hyperplasia or neoplasia it may result in hyperthyroidism. There is higher incidence of solitary renal cancer metastasis to thyroid and thyroid metastasis may be the initial manifestation of kidney neoplasm or it may only represent the spread of disease. Reason for the spread

of renal tumors to thyroid is still not clear. Distinction between clear cell thyroid tumor thyroid and renal cancer metastasis is difficult on haematoxylin and eosin stained sections alone. Markers such as TTF-1 are specific for thyroid tumors and CD10 marker is of importance in renal neoplasms while PAX8 labels both of these tumors.

Figures:-

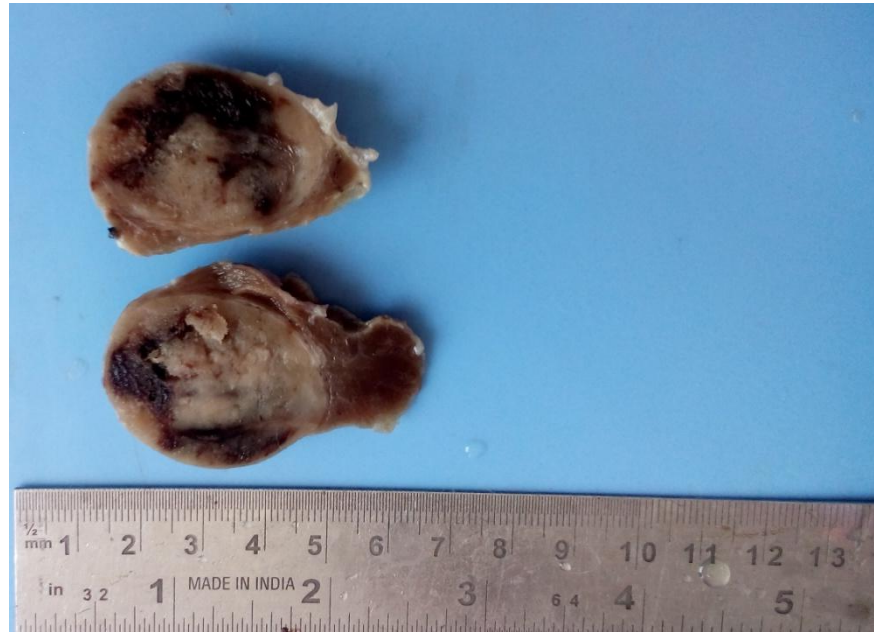


Fig.1- Well- circumscribed encapsulated grey-white soft tissue with cystic degeneration and hemorrhages which is compressing normal thyroid.

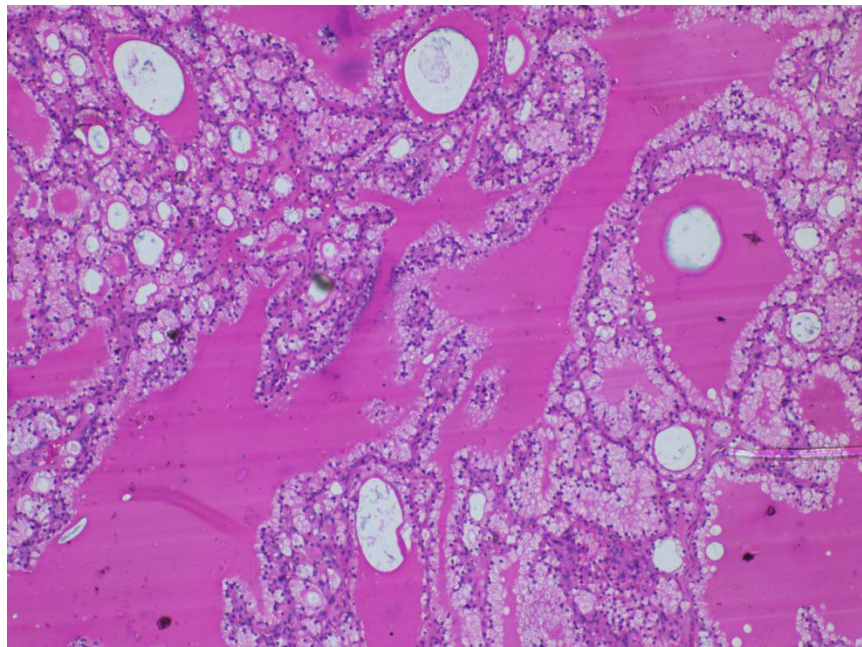


Fig.2a- Mixed pattern of thyroid

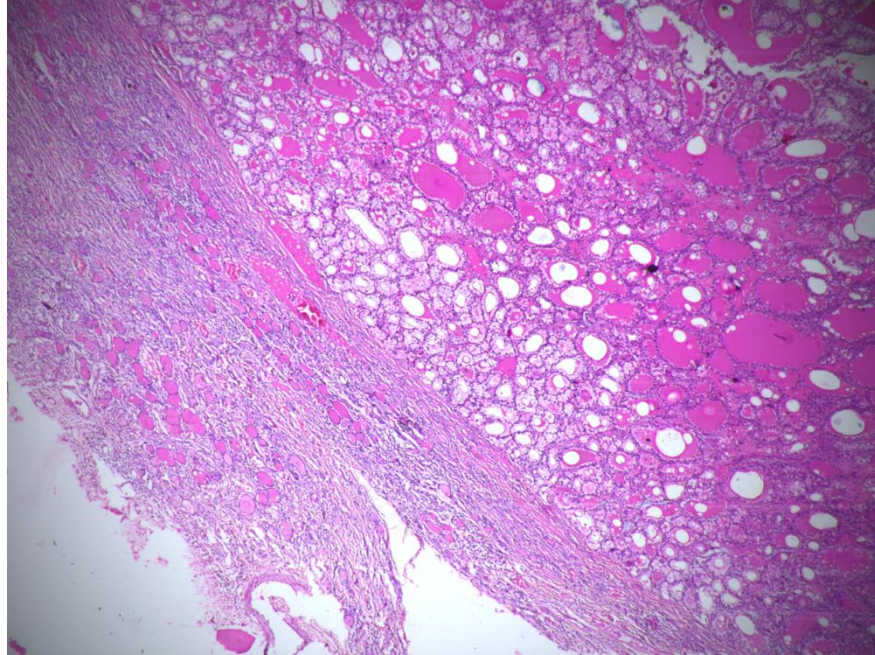


Fig.2b- Histological tissue specimen with thick capsule in middle, adenoma formation at right and normal tissue formation at left.

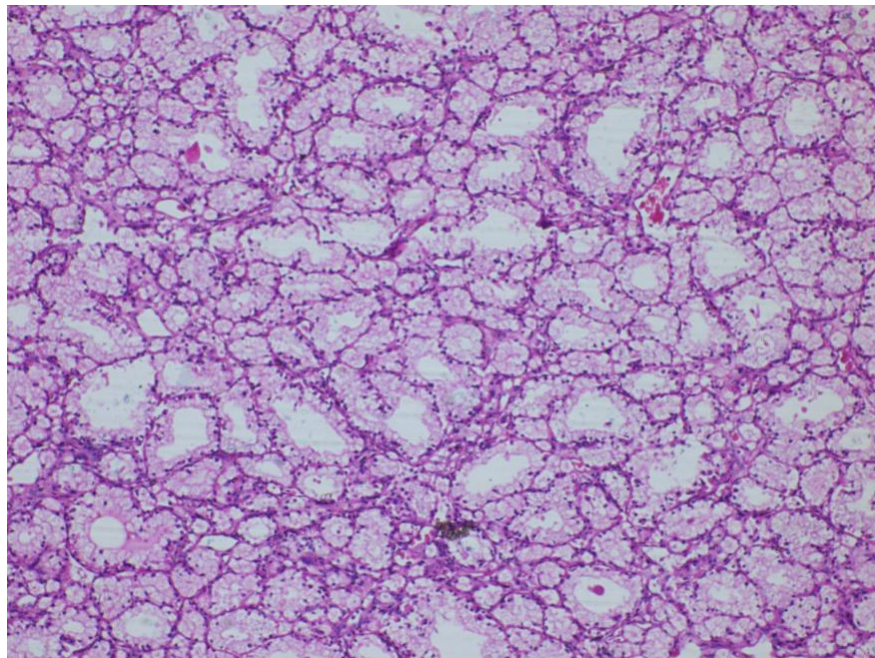


Fig.2c- Histological tissue specimen showing thyrocytes in which nucleus is settled at centre with a thick capsule at bottom and clear cytoplasm.

Conclusion:-

Any thyroid lesion with clear cell features warrants further histopathological assessment as clear cell changes are not appreciated in cytological smears. A morphological examination must be done first when patient presents with a thyroid lesion with clear cells. Next, other differential diagnosis including thyroid and parathyroid tissues with clear cytoplasmic changes and clear cell tumor metastasis such as Renal cell carcinoma must be carefully considered. Our present case is of interest due to the pathology of pure clear cell Follicular adenoma which is rarely seen.

Conflict of interest:-

There are no conflict of interests to disclose.

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