Well differentiated Oncocytic carcinoma of thyroid by histology with a clinical behavior like an anaplastic Cancer

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**Background**

1. Hürthle cell or Oncocytic carcinoma is a variant of follicular cell carcinoma of thyroid.
2. It accounts for <5% of all differentiated thyroid malignancies.
3. Hürthle cells are characterised by eosinophilic cytoplasm with trabecular/follicular growth pattern [1]. Oncocytes are seen in follicular cell carcinoma but in HCC, oncocytes represent more than 75% of cells, which exhibit a rather more trabecular growth pattern [2].
4. Oncocytic variant of papillary carcinoma is the term used to identify the thyroid cancers with a combination of nuclear features and papillary growth pattern in addition to their oncocytic cytoplasm.
5. The oncocytic variant of papillary carcinoma, although rare, appears to represent a morphologically distinctive variant of papillary cancer and follow a low-grade clinical behavior akin to conventional papillary carcinoma [3].
6. Older age and larger tumor size predicted reduced survival [4]. The decreased survival in patients with lymph node metastases may be explained by its association with distant metastases [4].
7. In a 60 year series, it is reported that prognosis is that reliably predicted by degree of invasion, tumor size, extra-thyroidal disease extension, and initial nodal or distant metastasis. Recurrence portends a poor outcome.
8. Here we present a case with well differentiated histology but clinical behavior like anaplastic Carcinoma.

**Clinical Case Details**

A 59 year old man presented to emergency room with rapidly of enlarging mass on the right side of the neck over two months history. No history of compressive symptoms or thyroid dysfunction. CT neck done in ER revealed a 4 cm mass in the thyroid with irregular borders. The mass was found to be heterogeneous, with irregular borders, intra nodular calcification & vascularity on US thyroid. FNA cytology revealed follicular epithelial cells containing prominent nuclei and demonstrating occasional papillary architecture. Rare, scattered nuclear pseudo inclusions and nuclear grooves were noted. The findings were highly suspicious for a neoplasm with both oncocytic and papillary features, favoring a papillary carcinoma.

CT Chest: Mass in the right lobe thyroid of 5.0 cm with mild tracheal deviation and no lymphadenopathy in the neck; multiple bilateral pulmonary nodules highly suspicious for metastasis. The largest in right middle lobe is about 2 cm. He underwent total thyroidectomy. Gross pathology demonstrates solid, papillary, and insular growth patterns, oncocytic cell features, and areas of clear cell change. The tumor has distinct oncocytic features (Hürthle cell carcinoma) in a number of areas with extensive tumor necrosis. There is no evidence of undifferentiated/anaplastic carcinoma. The neoplasm had multifocal invasion of skeletal muscles and blood vessels, and a mitotic rate of > 3/10 high power field. His post-op stimulated thyroglobulin level was 302 ng/ ml (1.4 - 29.2) with negative anti Tg antibodies. Bone scan was negative for metastases. Pretreatment scan with 2 mCi of I-131: focal uptake in thyroid bed (uptake 7%) with no uptake in lung lesions. He was treated with 300 mCi of I-131. Post RAI treatment scan did not show any focal activity in the lungs. Repeated CT chest 6 weeks after I-131 therapy, 14 weeks after 1st CT chest showed increase in size of all previous lung lesions with the largest nodules now 3.4 cm, new bilateral pulmonary lesions, and new sub-carinal lymph node of 3.7 cm showing central necrosis. Neck CT: Metastatic lesion in the jugular vein; negative for

**Imaging Studies**

Clinical Case Details

any atypical or enlarged lymph nodes. Wedge resection of the lung and sub-carinal mass was done with histopathology consistent with well differentiated oncocytic variant of papillary carcinoma with no anaplastic changes. PET-CT 1wk post lung resection: hyper metabolic lymph node in right neck compartment II, Four hyper metabolic left lower lobe densities consistent with metastatic disease, no abnormal uptake in mediastinal lymph nodes. BRAF was negative. Biopsy of lymph nodes neck; pathology similar to thyroid lesion. The patient was considered as stage IVc (T3N0M1). He was started on TKI, sorafenib, in addition to suppressive dose of levothyroxine. LT4 doses needed to be adjusted on sorafenib.

Response to TKI for 3 months: some lesions regressed completely; some decreased in size; some increased in size. New liver metastases noted. Therapy continued. Patient developed intra cranial mets with intracranial bleed. Sorafenib stopped; had radiation therapy to brain lesion. Now patient is on hospice care.

**Interesting Features**

1. Metastatic lesion in the jugular vein.
2. Clinical behavior is more like anaplastic though histologically well differentiated.
3. Mets to sub-carinal area without regional lymph node metastases in the neck.
4. Papillary variant of oncocytic carcinoma with negative BRAF.

**Pathology**

FNA thyroid nodule: FAP stain - 40X
1. Highly cellular with little or no colloid
2. Cells are poorly cohesive, as isolated cells or small aggregates. Cells have large, polygonal and distinctly granular cytoplasm, round nuclei, often prominent nucleoli, characteristic of oncocytic neoplasm.
3. Moderate variation in nuclear size & increased nucleocytoplasmic ratio suggestive of carcinoma

**Tissue section-10X:**

A: Normal thyroid follicles
B: Neoplasm with solid and nested growth pattern with infiltrating border and lacking colloid.

**References**