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Case Report

Anaplastic transformation in a recurrent papillary thyroid carcinoma: A case report

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ABSTRACT

Recurrence of well differentiated thyroid carcinomas with anaplastic transformation has been a challenge to the clinicians and is life threatening to the patient. Transformation of papillary thyroid carcinoma to the anaplastic variant in the metastatic foci is very rare. We report a case of recurrent papillary thyroid carcinoma with anaplastic transformation metastasizing to larynx. The challenge for pathologists is to identify this transformation, so that treatment may be tailored appropriately.

1. Introduction

Thyroid carcinomas are the most frequently encountered endocrine malignancies.[1] The age standardized (world) incidence and mortality rate of thyroid carcinoma per 100,000 population is estimated to be 6.6 and 0.43 respectively.[2] Papillary thyroid carcinoma, a well differentiated thyroid carcinoma accounts for 90% of thyroid carcinomas and is known for their non aggressive nature with low cancer specific mortality rate.[3,4] But at the same time papillary thyroid carcinoma relapses can result in potentially life threatening consequences.[5] Measurement of serum Thyroglobulin along with radiographic studies has high sensitivity in detection of recurrent disease.[6] Various genetic and epigenetic changes in well differentiated thyroid carcinomas can transform them to poorly differentiated/undifferentiated/anaplastic carcinomas.[7] Anaplastic thyroid carcinomas account for about 1-2% of thyroid malignancies and contributes to 14-39% of thyroid cancer deaths, with a mean survival rate of 6 months from diagnosis, regardless of treatment.[8]

2. Case Report

A 67 years old male presented to our hospital with complaints of hoarseness of voice for two months. He was a known hypothyroid and was on medication for the same. On local examination, left lobe of thyroid was enlarged. USG Guided FNAC was suggestive of papillary carcinoma of thyroid. PET CT scan of neck revealed focal avid nodules in both lobes of thyroid with multiple left cervical and superior mediastinal lymph nodes, consistent with Carcinoma thyroid with lymph nodal metastases. Associated erosion of left lamina of thyroid cartilage by a soft tissue along the superior part of the left lobe of thyroid with left vocal cord palsy was also seen. Patient underwent total thyroidectomy with central compartment clearance and left functional neck dissection. Histopathology was consistent with Papillary carcinoma of left lobe with left cervical node metastasis. Post-op he was treated with radioactive Iodine-131 therapy.

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On follow up evaluation, 15 months after initial surgery, patient had a recurrence in the thyroid bed. Physical examination revealed a firm mass on left side of the neck, measuring 2x3 cm. Lymphadenopathy was absent. Serum Thyroglobulin level was elevated (146.2ng/ml). USG neck showed well-defined hypoechoic nodule with punctate calcifications in the region of left lobe of thyroid, suggestive of probable recurrent papillary carcinoma of thyroid. I-131 study revealed no evidence of iodine avid residual thyroid tissue, local or distant metastases. FDG – PET scan revealed a 3.4x1.8x3.2cm metabolically active soft tissue lesion in the region of left thyroid bed, associated with contiguous destruction of the left lamina of thyroid cartilage. Also seen was focal FDG uptake in the right posterolateral aspect of cricoid cartilage. Patient underwent neck exploration, central compartment clearance and level 2 lymph node clearance. Final Histopathological diagnosis was consistent with Recurrent Papillary thyroid carcinoma.

Four years later, patient presented with breathing difficulty and stridor. FDG PET CT Scan revealed a metabolically active soft tissue in the region of left thyroid bed, associated with contiguous destruction of the left lamina of thyroid cartilage with interval extension of the soft tissue to the left paraglottic space and resultant narrowing of glottic aperture, interval development of 3.2 x 1.5 cm metabolically active soft tissue lytic lesion involving the right lamina of thyroid cartilage and also involving the right cricoid cartilage.

Patient underwent total laryngectomy with Tracheoesophageal puncture and Percutaneous gastrostomy tube insertion. Histopathological examination revealed Metastatic papillary carcinoma of thyroid with extensive areas of Anaplastic transformation /Differentiation-Epithelial pattern (Squamoid) and 1/31 lymphnodes showing metastatic papillary carcinoma thyroid. (Figure 1 a). Immunohistochemical studies showed diffuse strong positivity for PAX 8 and TTF 1 in Classical papillary areas. Anaplastic foci were diffuse and strongly positive for p63 (Figure 1 b) and p40 (Figure 1 c), variable positivity for TTF1 and PAX 8. (Figure 1 d), thus confirming the morphological diagnosis. Following this the patient was administered adjuvant radiotherapy.

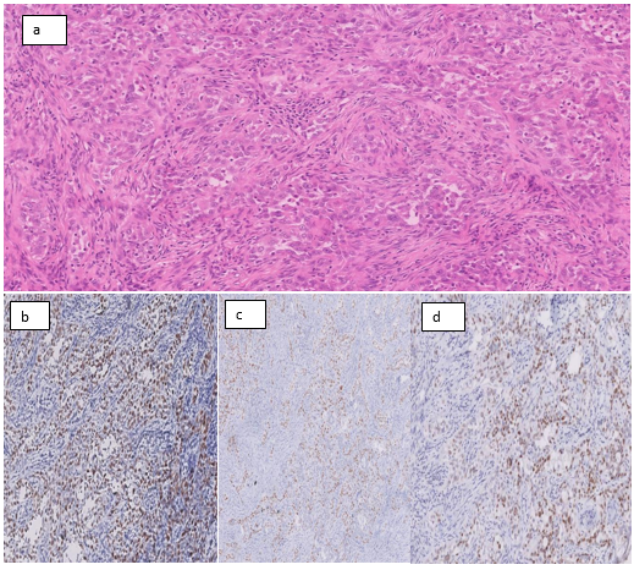

Fig. 1: a: HEx40X papillary thyroid carcinoma with anaplastic areas; **b:** p63 immunohistochemical stain highlights squamoid areas **c:** p40 immunohistochemical stain highlights squamoid areas; **d:** PAX8 immunohistochemical stain highlights papillary component of tumor

3. Discussion

Papillary thyroid carcinomas have a good survival rate of 96% at five years, 93% at 10 years, and > 90% at 20 years; despite this, recurrence of papillary thyroid carcinoma is still a night mare among surgeons.[9] Age more than 45 years at the time of diagnosis, male sex, incomplete surgical excision, lymph node metastasis, tumor size, histologic variant, presence of extra-thyroidal and extra-nodal extension makes way for recurrence.[9] Measurement of serum thyroglobulin levels in conjuction with radioactive iodine imaging or USG neck are sensitive tools in assessing the recurrence in papillary thyroid carcinoma patients.[10] In this case, patient had elevated Serum thyroglobulin levels in the follow up evaluation, even though the radioactive iodine uptake study was negative. This called the need for an alternative imaging, FDG-PET, which showed focal uptake. This phenomenon of raised serum thyroglobulin levels and negative radioactive iodine scan has been attributed to the TENIS syndrome -Truncated Expression of sodium-iodide symporter. The sodium/iodide symporter is a membrane glycoprotein that mediates the uptake of one I^- ion along with two sodium ions down their electrochemical gradient across the basolateral membrane of thyrocytes.[11] Normal thyroid follicular cells express NIS, synthesise thyroglobulin, take up iodine and produce thyroid hormones. Well Differentiated Thyroid Carcinomas retain all the features of normal follicular epithelial cells except, synthesis of thyroid hormones.[12] Well Differentiated Thyroid Carcinomas have typical cytological features such as nuclear grooving, clearing and inclusions, and maintain histological resemblance to the thyroid follicle.[12] With dedifferentiation, the cells become primitive in structure and function, changing into poorly differentiated/anaplastic cancers.[12] As the dedifferentiation progresses, thyroid follicular epithelial cells loose NIS expression, while ability to synthesise thyroglobulin remains intact for longer periods.[12]

4. Conclusion

Well differentiated thyroid carcinoma evolving into an anaplastic phenotype is a well known phenomenon. Hence, it is always wise to look for dedifferentiation in the primary as well as metastatic sites with the help of ancillary studies which can have prognostic and therapeutic significance.

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Conflicts of interest

There are no conflicts of interest.

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