



PAPILLARY THYROID CARCINOMA AND SQUAMOUS CELL CARCINOMA IN CERVICAL LYMPHNODE - COLLISION METASTASIS , WHY AND HOW?

Histopathology

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ABSTRACT

Collision tumours refer to the presence of histologically different neoplasms of distinct origin in a single site. Papillary carcinoma of thyroid is one of the most common malignancy in the thyroid gland which is associated with good prognosis. Papillary carcinoma thyroid can metastasise to lymphnode however presence of squamous cell carcinoma and papillary carcinoma in cervical lymphnode (Collision tumour) is a rare presentation which is associated with bad prognosis and warrants appropriate treatment with a multidisciplinary approach. Here we present a 65 year old male who was diagnosed to have Collision metastasis (Squamous cell carcinoma and papillary carcinoma) in right cervical lymphnode. This case is presented due to its rarity, occurrence in a male patient and to emphasise the need for multidisciplinary approach including radiotherapist for treatment purposes. Presence of Squamous cell carcinoma and Papillary carcinoma (Collision Metastasis) in lymphnode could be due to Dedifferentiation of Papillary thyroid carcinoma at Metastatic site or Metastasis from Extrathyroidal Primary Squamous cell carcinoma. Immunohistochemistry would help in ascertaining the thyroid origin of the squamous cell component. Any clinically aggressive thyroid tumour must alert both the clinician and the pathologist as it warrants careful search for transformation to aggressive histological type of malignancy.

KEYWORDS

Collision, thyroid, Papillary thyroid, squamous, CK7,CK19

INTRODUCTION:

Collision tumour refers to the presence of histologically different neoplasms of distinct origin in a single site (1). Papillary carcinoma of thyroid is one of the commonest malignancy in the thyroid gland which is associated with a good prognosis. Papillary carcinoma thyroid can metastasize to lymphnode but however presence of squamous cell carcinoma and papillary carcinoma in cervical lymphnode (Collision metastasis) is a rare presentation which is associated with a bad prognosis and warrants appropriate treatment with a multidisciplinary approach. Here we present a 65 year old male who presented with huge mass in the neck as explained in detail below and diagnosed to have Collision metastasis (Papillary thyroid carcinoma and squamous cell carcinoma in cervical lymphnode). This case is presented due to its rarity and occurrence in a male patient. A detailed insight as to why and how collision tumours occurs at metastatic site has also been provided in this case report.

Case History:

A 65 year old gentleman presented with longstanding swelling in the right side of neck since 10 years with rapid increase in size causing limitation of movement of neck due to huge size. O/E: Nodule was noted in right lobe of thyroid measuring 8x7cm with restricted mobility. Huge mass of size 30x25cm in right cervical region with variegated firm and cystic consistency extending to the posterior triangle upto Trapezius, superiorly to angle of mandible and inferiorly upto the clavicle (Fig 1). Diagnosis of Carcinoma Thyroid with nodal metastasis and Right vocal cord palsy was made on clinical grounds. CT neck and chest contrast showed calcified nodule in right lobe of thyroid gland measuring 8.8x5.5cm extending upto hyoid bone with tracheal displacement abutting the vertebra and displacing carotid and Internal Jugular vein. A large right cervical nodal mass measuring 15cm in level II, III, IV, and V compressing Internal Jugular vein was noted (Fig 2). No lung nodules were noted on CT neck and chest. Core biopsy was done with was suggestive of papillary carcinoma thyroid. Total thyroidectomy, Right Modified Radical Neck Dissection and Bilateral central compartment neck dissection was done. Gross examination of the right cervical nodal mass showed a conglomerate mass with a multinodular appearance and variegated cut surface showing firm grey white to tan areas. Focal colloid filled areas

containing papillary excrescences, yellowish areas (?necrosis) and cystic areas were noted. The right lobe of thyroid gland showed a tumour measuring 10x6x5 cm with a vaguely nodular firm grey white to tan cut surface and papillary excrescences. A thin peripheral rim of adjacent compressed thyroid parenchyma is noted. Sectioning the left lobe of thyroid gland showed a brown cut surface with a nodule measuring 0.5cm in diameter in the mid portion of thyroid gland. Histopathological examination of the right cervical nodal mass showed lymphnode extensively replaced by a papillary carcinoma thyroid and some areas showing moderately differentiated squamous cell carcinoma (Fig 3-6). Cystic changes, inflammatory granulation tissue and suppuration were noted. Histopathological examination of the Right lobe of thyroid gland showed Classical variant of papillary carcinoma thyroid with 1 out of 3 central compartment lymphnode showing metastasis with tall cell features (<10%). Left lobe of thyroid showed Follicular variant of papillary microcarcinoma.

In the current case, Immunohistochemistry (IHC) showed diffuse cytoplasmic positivity for CK7&CK19 in papillary and squamoid areas (Fig 7-8), and strong nuclear positivity for p63 in squamoid areas (Fig 8). TTF-1 showed nuclear positivity in papillary areas (Fig 9) and CK5/6 was positive in squamoid areas. The Immunoprofile favours the origin of the squamous cell component to be from the thyroid, possibly due to dedifferentiation. Postoperative period was uneventful and the patient recovered in a good stable condition without requiring tracheostomy. On followup, the patient received radioactive Iodine therapy and was on suppressive dose of thyroxine. As squamous cell carcinoma in the lymphnode metastasis is aggressive, the patient is also planned for External beam Radiation to neck to avoid recurrence. The patient is yet to receive External beam Radiation to the neck.

DISCUSSION:

In 2020, Globally, the age-standardised incidence rates of thyroid cancer were 10¹ per 100000 women and 3.1 per 100000 men. The age-standardised mortality rates were 0.5 per 100000 women and 0.3 per 100000 men (2). Papillary carcinoma of thyroid is one of the most commonest malignancy in the thyroid gland. It accounts for 80% of the tumours of the thyroid gland and is associated with a good prognosis (3). The 10 year survival rate of papillary carcinoma thyroid is over

90% (4). Primary squamous cell carcinoma of the thyroid gland accounts for <1% of the thyroid malignancies and is associated with a poor prognosis (5). But, occurrence of Collision tumour of the thyroid gland is rare and occurrence of collision metastasis is extremely rare. Spagnolo and Heenan et al defined collision tumor as the presence of two distinct, topographically separate sites of origin for the two components, and with at least some separation between the two components, despite intimate mixing at the point of juxtaposition (6). Collision tumours have a slightly preponderance for women and occurs in 5th-6th decade.

The various collision tumours of the thyroid gland reported in literature till date includes Medullary and Papillary carcinoma, Papillary carcinoma thyroid and Adenocarcinoma of lung, Papillary carcinoma thyroid and Liposarcoma, etc. (7-8). There are few case reports on collision tumour (Papillary carcinoma thyroid and Squamous cell Carcinoma) in the thyroid gland and metastatic sites like lymphnodes.

Till 2015, 33 cases of collision tumors of the thyroid gland with few cases (~2-3 cases) of collision tumour at metastatic site - Collision metastasis have been reported (9-10). Papillary carcinoma thyroid can metastasize to lymphnode but however presence of papillary carcinoma thyroid and squamous cell carcinoma in cervical lymphnode is a rare presentation which is associated with a bad prognosis and warrants appropriate treatment.

The question arises as to the origin of the squamous cell carcinoma as normal thyroid gland doesnot contain squamous cells. Presence of Squamous cell carcinoma and Papillary carcinoma thyroid (Metastatic Collision Tumour) in a lymphnode could be due to Dedifferentiation of Papillary thyroid carcinoma at Metastatic site or Metastasis from Extrathyroidal Primary Squamous cell carcinoma (11-12). Dedifferentiation can occur in metastatic site rather than the primary site.

Other possible explanation for the presence of squamous component in the thyroid gland could be due to the chronic inflammation (like Hashimoto's thyroiditis, etc.), embryonic remnants of squamous epithelium (Ultimobranchial body, thyroglossal cyst or thymic epithelium) or squamous metaplasia (13). If the component of squamous cell carcinoma is due to de-differentiation of papillary carcinoma thyroid, Immunohistochemistry (IHC) shows diffuse cytoplasmic positivity of CK7 and CK19 (14). Various theories have been proposed as to the origin of squamous cells in the thyroid gland or in the metastatic site.

Lax et al proposed the "pluripotent precursor cell" theory according to which they arise from a single pluripotent precursor cell. "Neoplastic coercion" states that a single neoplasm arises, thereby altering the microenvironment which can promote the development of a new second tumor. Next theory is "Random Collision theory" which is due to chance meeting of 2 primary tumors (15). Hence, thyroid tumours never fails to surprise the pathologist or the clinician. Hence, any clinically aggressive thyroid tumour must alert both the clinician and the pathologist as it warrants careful search for transformation to aggressive histological type of malignancy.

CONCLUSION:

We hereby emphasis that whenever there is a rapidly progressive clinical course, possibility of transformation of papillary carcinoma thyroid to aggressive histological types needs to be beared in mind and a careful search for such areas in mandatory. In the current case, Immunohistochemistry (IHC) confirmed the Squamous cell carcinoma to be of thyroid origin, possibly due to dedifferentiation of papillary carcinoma thyroid.

The diagnostic skill of the pathologist is extremely important to help the clinician in proper treatment of the patient. Collision tumours pose diagnostic and therapeutic challenge. Multidisciplinary approach which includes surgeon, pathologist, radiologist and radiotherapist is required in such cases as they require External beam radiation therapy.

Conflict of Interest statement: Nil

Ethics statement including Patient consent statement: As the identity of the patient is not revealed, a kind request to provide waiver from providing consent statement.



Fig 1: Huge mass in the right cervical region and nodule in front of neck.

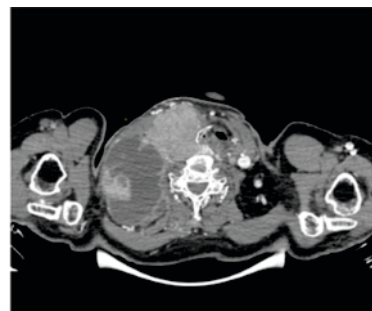


Fig 2: Contrast enhanced CT Neck in coronal and Axial plane showing irregular enhancing nodule in the right lobe of thyroid gland and enlarged right level V cervical lymphnode with heterogeneous enhancement and cystic areas. Tracheal shift towards left side noted. Findings suspicious of Carcinoma thyroid with lymphnodal metastasis.

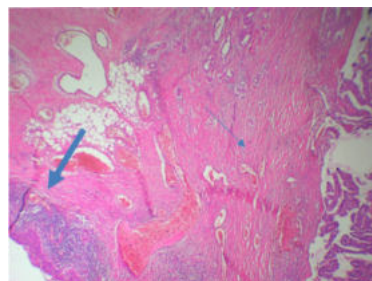


Fig 3: H&E Image showing lymphnode with papillary thyroid carcinoma (Indicated by Black arrow) and squamous cell carcinoma (Indicated by Blue arrow) at 40x

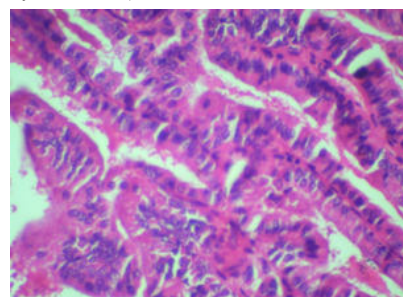


Fig 4: Papillary structures lined by cells displaying nuclear features of papillary carcinoma thyroid at 400x

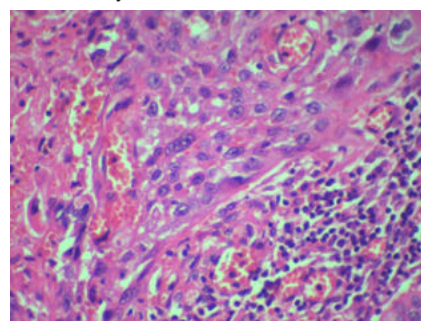


Fig 5: Moderately differentiated squamous cell carcinoma at 100x

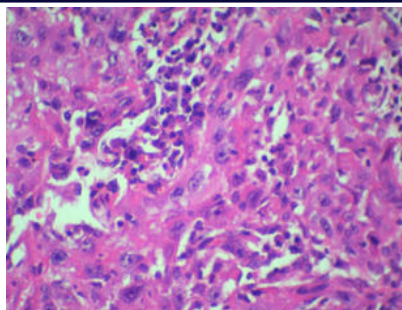


Fig 6: Moderately differentiated squamous cell carcinoma at 400x

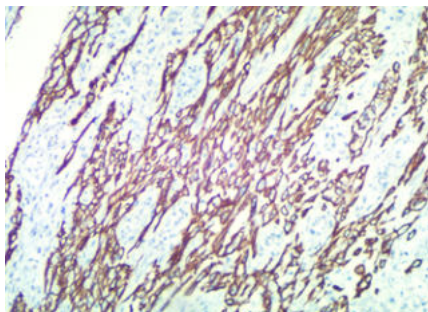


Fig 7: IHC for CK7 showing diffuse cytoplasmic positivity in both papillary thyroid carcinoma squamous cell carcinoma.

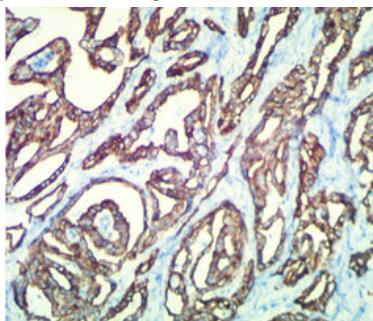


Fig 7: IHC for CK19 showing diffuse cytoplasmic positivity in both papillary thyroid carcinoma squamous cell carcinoma.

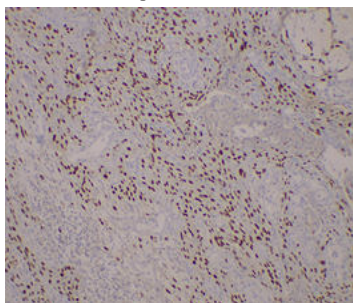


Fig 8: IHC for p63 showing strong nuclear positivity in squamous cell carcinoma.

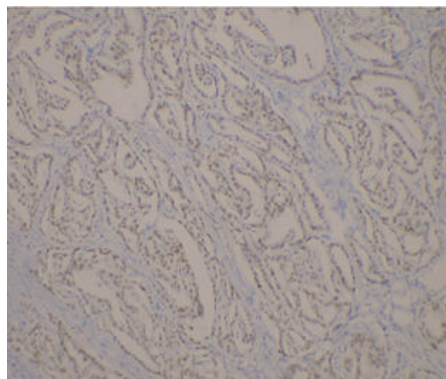


Fig 9: IHC for TTF-1 showing nuclear positivity in papillary areas.

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