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MODESTUM

Case Report **OPEN ACCESS**

Collision tumor of the thyroid gland: Follicular carcinoma and papillary microcarcinoma

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ABSTRACT

Collision tumor represents the proximal coexistence of two histologically distinct tumors. The combination of two different types of tumors in a single thyroid gland is extremely unusual. We reported a case of follicular carcinoma and papillary microcarcinoma occur independently as a primary tumor separated by a normal tissue in a 59- year-old Saudi female, presented at the clinic with goiter for two months duration without symptoms of thyroid hormonal disorders. This case is one of few cases to be reported as a combined follicular thyroid carcinoma and papillary thyroid carcinoma in English literature.

Keywords: collision tumor, papillary, microcarcinoma, follicular carcinoma

INTRODUCTION

Collision tumor refers to the coexistence of two or more histologically distinct neoplastic morphologies separated by normal tissue in one or more organ systems.

In thyroid gland collision tumors are rare with most literature describing combination of medullary and papillary carcinomas or metastatic tumor coexisting with papillary carcinoma [1]. Papillary thyroid carcinoma is the most common malignant neoplasm of the thyroid gland characterized by malignant epithelial tumor showing evidence of follicular cell differentiation and a set of distinctive nuclear features. It is the predominant form of thyroid cancer in both adult and children. Papillary micro carcinoma is a variant that is less than 1 cm in diameter. Follicular thyroid carcinoma is the second most common thyroid malignancy in which the diagnostic nuclear features of papillary thyroid carcinoma are absent [2]. However, the synchronic occurrence of both together is extremely rare [1].

CASE REPORT

A 59-year-old Saudi female presented with a central neck mass for two months' duration associated with dysphagia. Physical examination revealed a 5×4 cm left thyroid nodule and right thyroid nodule around 2 cm in diameter, both were firm in consistency and move with deglutition with no cervical lymphadenopathy. Thyroid function tests were within normal limits. Ultrasound imaging of the thyroid gland showed a complex left thyroid nodule measured 4.7 cm in greatest dimension and right thyroid nodule around 1.9 cm, both were associated with micro-calcifications. Right thyroid fine needle aspiration cytology revealed a benign follicular nodule, bethesda category II. Left thyroid lobe FNAC showed atypia of undetermined significance, bethesda system category III.

Patient underwent total thyroidectomy, sampling of the central compartment and discharged on good condition.

Histopathology grossing revealed a total thyroidectomy specimen.

Grossly, the sizes of the right lobe, isthmus, and left lobe were 5×2×1.5 cm, 1.5×1×0.5 cm, and 7×5×3 cm, respectively. The specimen was serially sectioned into 20 slices. Left lobe slices showed white tan heterogenous well circumscribed mass on the middle pole measuring 4.7 cm in greatest dimension and away from the capsule by 0.3 cm.

Microscopic evaluation of the slides from left lobe, revealed encapsulated follicular carcinoma with extensive angioinvasion, (**Figure 1a-1c**) combined with papillary microcarcinoma on the same lobe separated by normal thyroid tissue (**Figure 2a-2b**).

Immunohistochemical studies revealed reactivity of papillary carcinoma to CK19, while it was negative in follicular carcinoma (**Figure 2c-2d**). Follicular tumor cells were negative for amyloid and calcitonin.

The central cervical lymph node sampling specimen was free of tumor cells.

The post-operative period was uneventful. She had radioisotope scanning and ablation. Whole body I-131 scan did not show any evidence of uptake.

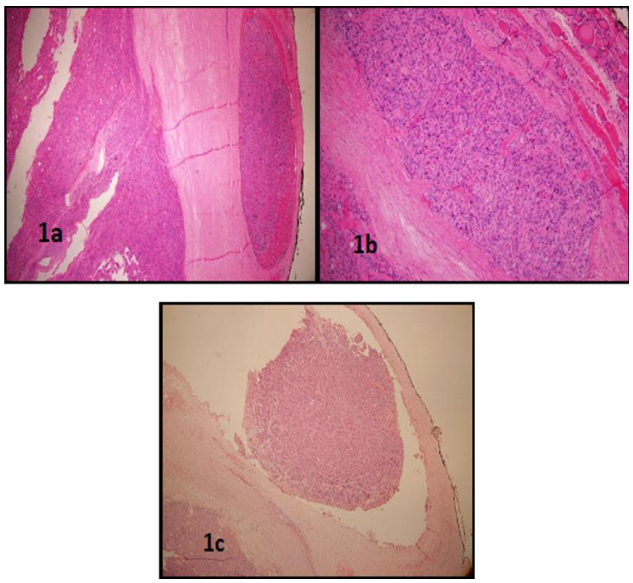

Figure 1. Thyroid follicular carcinoma with a focus of angioinvasion, H&E×20× (1a); Angioinvasion (high power view) in thyroid follicular carcinoma, H&E×40× (1b); & A large tumor emboli within a vessel with a small focus of main tumor seen in lower left corner, H&E40× (1c)

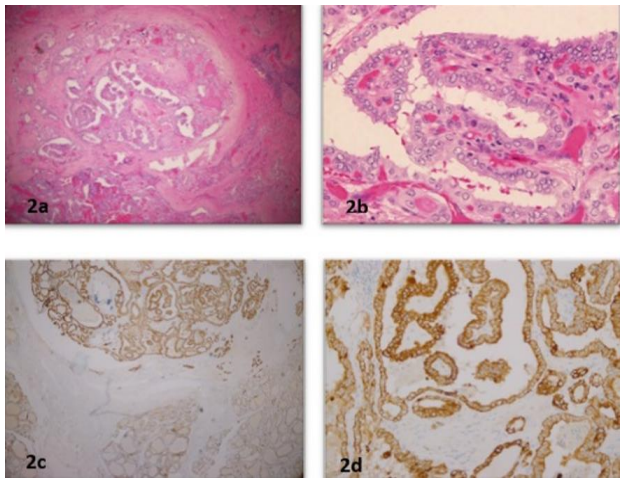

Figure 2. Whole mount view of papillary thyroid carcinoma, H&E10× (2a); Cytological features of PTC, nuclear grooves, overlapping, and elongation, H&E, 40× (2b); Immunohistochemical stain CK-19 positivity highlighting PTC in contrast to background negative staining, 20× (2c); & CK-19 in PTC as seen in high power view, 40× (2d)

Three years follow up, clinical history, physical examination, neck ultrasonography did not show any suspicious lesion. TSH level 0.043 (0.35-4.94), suppressed thyroglobulin level 0.8 ng/ml (2-70) and anti-thyroglobulin level 1.83 (≤4.11) which suggest no recurrence of the disease although life-long follow up is needed in such cases (**Figure 2**).

DISCUSSION

Collision tumor refers to the coexistence of two or more histologically distinct neoplastic morphologies separated by normal tissue in one or more organ systems. Collision tumors of the thyroid are rare, with most literature reporting coexistence of medullary and papillary carcinomas, or metastatic tumors coexisting with papillary carcinoma [1].

This is one of the few cases to be reported of combined follicular carcinoma with papillary carcinoma [1, 3-5]. This extremely rare coexistence of follicular with papillary carcinoma was first reported in March 2013 [3], followed by a second case in the same year [1] followed by a case reported as minimally invasive follicular carcinoma with papillary microcarcinoma [6] Likewise, a single case of combined tall cell carcinoma and hurthle cell carcinoma also was reported in the literature [4], another case of co-occurring follicular carcinoma with papillary carcinoma and anaplastic carcinoma was reported in 2013 [5]. Moreover, there are 20 cases combining medullary and papillary carcinomas reported before [7-9]. There were also several reports of metastatic lesions appearing in conjunction with papillary carcinoma [10-12]. Primary squamous cell carcinoma was also described in collision tumors along with papillary carcinoma of the thyroid 3 times before [9, 13, 14].

A series composed of six cases of follicular and papillary collision tumors was reported in 2020 and this was the first series of these rare collision tumors [15].

Although the papillary microcarcinoma has an excellent prognosis and no instance of distant metastasis, follicular carcinoma tends to metastasize hematogenously [2]. The tendency to metastasis through lymphatics and the prognosis of the combination are yet to be determined due to the paucity of the reported cases.

The patient has followed up more than three years after treatment without recurrence and to our knowledge this was one of the cases which have been followed for long period without any further complication.

Table 1 shows a summary of some published thyroid collision tumor cases (papillary and follicular).

Table 1. Summary of some published thyroid collision tumor cases (papillary and follicular)

Author	Age	Sex	C/P	Anatomical site	Radiology	FNAC	Histopathological diagnosis
Baloch et al. (2001)	72 Y	M	Left side of the neck mass	Mass on the left lobe of the thyroid	7 cm large heterogeneous solid mass with direct extension into or a contiguous mass in the isthmus replaced the entire left lobe of the thyroid	PTC	Tall cell papillary carcinoma of the thyroid and solid and trabecular hurthle cell carcinoma
Plauche et al. (2013)	33 Y	M	Anterior neck swelling	Right lobe	3.6×3.0 cm hyperechoic nodule	Adenomatous nodule/follicular neoplasm	Follicular carcinoma with vascular invasion and PTC
Takano et al. (2013)	78 Y	F	Anterior cervical swelling	Right & left lobes	1 cm each	Papillary thyroid carcinoma	Follicular carcinoma, papillary carcinoma, & adenomatous goiter
Mohammadzadeh et al. (2013)	40 Y	M	Right neck mas	Right lobe	4.2×3.7×3.1 cm solid tumor with peripheral calcification	Papillary thyroid carcinoma	Follicular, papillary, & anaplastic carcinoma

Table 1 (continued). Summary of some published thyroid collision tumor cases (papillary and follicular)

Author	Age	Sex	C/P	Anatomical site	Radiology	FNAC	Histopathological diagnosis
Thomas and George (2018)	33 Y	M	Anterior neck swelling	Right lobe	3.6×3.0 cm hyperechoic nodule	adenomatous nodule/follicular neoplasm	Minimally invasive follicular carcinoma with papillary microcarcinoma
Feng et al. (2020)	40 Y	F	Thyroid nodule	Right lobe	1.8×1.2 cm nodule	N/A	Papillary & follicular carcinoma
Abdelaal et al. (2020)			Case series of six patients				Follicular & papillary thyroid carcinoma in same thyroid lobe
Awadalla et al. (2000)	59 Y	F	Goiter	Left thyroid	4.37×4.03 cm, large well-defined mixed echogenicity focal lesion with a cystic component	Atypia of undetermined significance	Follicular carcinoma-encapsulated & extensively angioinvasive-, combined with papillary microcarcinoma

CONCLUSION

Synchronicity of papillary and follicular thyroid malignancy as collision tumor is a rare form of thyroid malignancies. Duality of the pathology makes the management complex mandate multidisciplinary team setting. It is necessary for the multidisciplinary team to be aware of the lesions, for the optimal diagnostic and therapeutic interventions.

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