

Case Report

A rare case of collision tumor of thyroid gland: simultaneous occurrence of calcitonin negative medullary thyroid carcinoma and papillary thyroid carcinoma

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ABSTRACT

Medullary thyroid carcinoma and papillary thyroid carcinoma are two distinct types of thyroid carcinoma having different cellular origin. The simultaneous occurrence of two distinct neoplasms termed “collision tumour” and it is a rare entity. Sometimes the medullary component does not show calcitonin positivity and hence this becomes a very rare entity. Herein we describe a very rare case of simultaneous occurrence of calcitonin negative medullary thyroid carcinoma and papillary thyroid carcinoma.

Keywords: Thyroid collision tumor, Calcitonin, Negative medullary thyroid carcinoma

INTRODUCTION

Thyroid tumors with differentiation of both parafollicular and follicular epithelial cells are rare. The majority of those reported have been composed of a single cell population with combined features of the two cell types.¹ The simultaneous occurrence of two distinct neoplasms termed “collision tumour”, derived from different cells of origin is a recognized, albeit rare, entity.² In the thyroid such lesions could consist of medullary carcinoma composed of parafollicular C-cells and well differentiated carcinoma showing follicular epithelial cell differentiation. A unique feature of MTC is the tumour’s ability to synthesize and secrete multiple tumor markers, including calcitonin (CT) and carcinoembryonic antigen (CEA). MTC is a neuroendocrine tumor (NET) of thyroid, showing calcitonin positivity. Occasionally, NET of thyroid may have no calcitonin expression. Here we report a rare case of collision tumour of thyroid gland

showing simultaneous occurrence of calcitonin negative MTC and PTC.

CASE REPORT

A 55 years old female presented to ENT OPD with anterior neck swelling since past 1.5 years with normal thyroid function tests. An ultrasound examination, showed a solid hypoechoic nodule of the right lobe of thyroid. FNAC was reported as benign follicular nodule.

She underwent hemithyroidectomy. Grossly there was a well circumscribed solid grey white nodule measuring 2.5×2 cms with peripheral rim of normal thyroid. On microscopic examination histomorphological features of encapsulated medullary carcinoma were present. The tumor was composed of solid islands and trabeculae of cells, separated by delicate to sclerotic fibrovascular septa and round to oval nuclei with stippled chromatin and inconspicuous nucleoli. There were areas of amyloid

deposits within the tumor (Figure1). On immunohistochemistry (IHC) the tumor cells were negative for thyroglobulin and calcitonin (Figure 2) and showed positivity for neuron specific enolase (NSE) (Figure 3) and chromogranin (Figure 4).

Patient was further investigated with contrast enhanced computed tomography of neck and thorax along with ultrasonography abdomen. No local or distant metastasis and no syndromic association were observed. The patient was subsequently subjected to completion thyroidectomy. Residual thyroid tissue grossly appeared unremarkable, however histopathologically a small focus of papillary microcarcinoma was found (Figure 5). This time the tumor cells on IHC showed thyroglobulin positivity (Figure 6) and were negative for calcitonin, neuron specific enolase and chromogranin. Postoperative serum calcitonin level was not elevated.

In view of varying histological features in both resected specimen, diagnosis of collision tumor comprising of medullary carcinoma in left lobe with papillary microcarcinoma in right lobe was rendered.

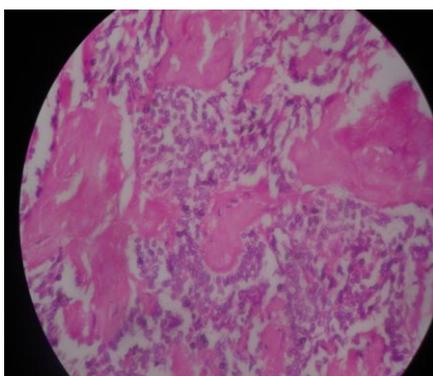


Figure 1: Medullary thyroid carcinoma.

Solid islands and trabeculae of cells, separated by delicate to sclerotic fibrovascular septa and round to oval nuclei with stippled chromatin and inconspicuous nucleoli. There were areas of amyloid deposits within the tumor H and E (40x).

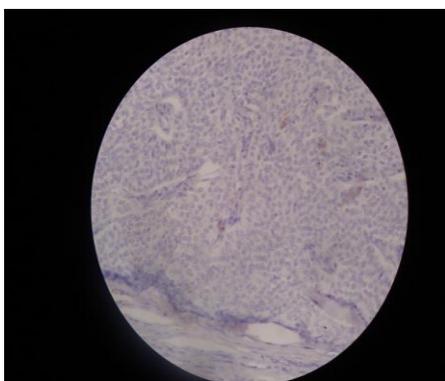


Figure 2: Medullary thyroid carcinoma.

The tumor cells show negative immunostaining for calcitonin (40x).

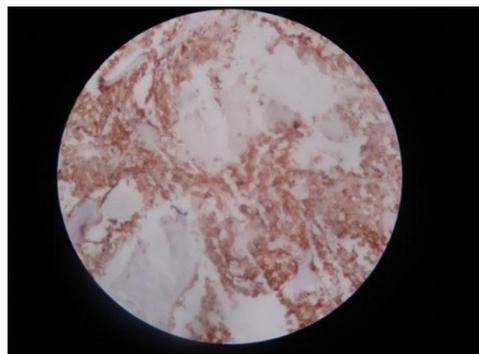


Figure 3: Medullary thyroid carcinoma.

NSE positive.

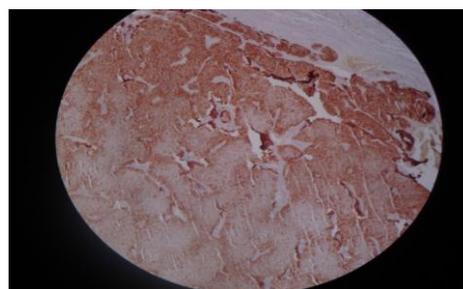


Figure 4: Medullary thyroid carcinoma.

The tumor cells show positive immunostaining for chromogranin (10x).



Figure 5: Papillary thyroid carcinoma.

H and E section showing characteristic nuclear features of papillary carcinoma (40x).

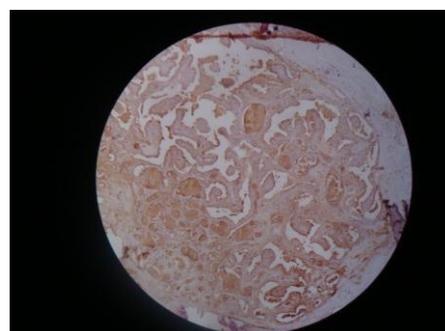


Figure 6: Papillary thyroid carcinoma.

Tumor cells show positive immunostaining for thyroglobulin (10x).

DISCUSSION

Collision tumors comprise two recognizable types of thyroid carcinoma, including follicular carcinoma plus medullary carcinoma and papillary carcinoma plus medullary carcinoma.¹⁻¹¹ The two components are either contiguous or intermingled. The existence of carcinoma showing mixed follicular and C-cell differentiation has generated considerable interest, because it challenges the classic concept of different origins for follicular cells and parafollicular C-cells.⁸ Although the two components may have a clonal origin from a common stem cell, most cases show a dual origin.¹²

NET of thyroid having no calcitonin expression but showing positive reaction to neuroendocrine markers, have been variably termed as “calcitonin negative NET (CNNET) of thyroid”, “C-cell derived calcitonin free neuroendocrine carcinoma of thyroid” and “atypical MTC”.¹³

It is extremely rare for MTC to present without a concurrent elevation of serum calcitonin, especially when MTC is more than 1 cm.

CONCLUSION

Diagnosis of the primary thyroid malignancy is crucial, since many thyroid tumors have different biological behaviour and treatment. It is important for clinicians to recognize that an aggressive form of thyroid cancer, such as MTC, may be present without expression of calcitonin. Unlike classic MTC, they have no serum markers like calcitonin for early diagnosis of recurrences, which makes the follow up more difficult. This case was also notable for the simultaneous occurrence of a focus of papillary microcarcinoma. Knowledge regarding this entity is essential in order to avoid diagnostic dilemma and also for prognostication.

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REFERENCES

1. Parker LN, Kollin J, Wu SY, Rypins EB, Juler GL. Carcinoma of the thyroid with a mixed medullary, papillary, follicular and undifferentiated pattern. *Arch Intern Med.* 1985;145(8):1507-9.
2. Pastolero GC, Coire CI, Asa SL. Concurrent medullary and papillary carcinomas of thyroid with lymph node metastases. A collision phenomenon. *Am J Surg Pathol.* 1996 Feb;20(2):245-50.
3. Sobrinho-Simoes M. Mixed medullary and follicular carcinoma of the thyroid. *Histopathol.* 1993;23(3):287-9.
4. Pfaltz M, Hedinger CE, Muhlethaler JP. Mixed medullary and follicular carcinoma of the thyroid. *Virchows Arch A Pathol Anat Histopathol.* 1983;400(1):53-9.
5. Gonzalez-Campora R, Lopez-Garrido J, Martin-Lacave I, Miralles-Sanchez EJ, Villar JL. Concurrence of a symptomatic encapsulated follicular carcinoma, an occult papillary carcinoma and a medullary carcinoma in the same patient. *Histopathol.* 1992;21(4):380-2.
6. Apel RL, Alpert LC, Rizzo A, LiVolsi VA, Asa SL. A metastasizing composite carcinoma of the thyroid with distinct medullary and papillary components. *Arch Pathol Lab Med.* 1994 Nov;118(11):1143-7.
7. Albores-Savedra J, de la Mora TG, de la Torre-Rendon F, Gould E. Mixed Medullary-papillary carcinoma of the thyroid: a previously unrecognized variant of thyroid carcinoma. *Hum Pathol.* 1990 Nov;21(11):1151-5.
8. Lax SF, Beham A, Kronberger-Schonecker D, Langsteger W, Denk H. Coexistence of papillary and medullary carcinoma of the thyroid gland-mixed or collision tumor? Clinicopathological analysis of three cases. *Virchows Arch.* 1994;424(4):441-7.
9. Hasney CP, Amedee RG. Mixed medullary-papillary carcinoma of the thyroid: a case report. *Laryngoscope.* 2010;120(S4):153.
10. Nangue C, Bron L, Portmann L, Volante M, Ris HB, Monnier P, et al. Mixed medullary-papillary carcinoma of the thyroid: report of a case and review of the literature. *Head Neck.* 2009;31(7):968-74.
11. Goyal R, Nada R, Rao KL, Radotra BD. Mixed medullary and follicular cell carcinoma of the thyroid with lymph node metastasis in a 7-year-old child. *Pathol Int.* 2005;56(2):84-8.
12. Papotti M, Negro F, Carney JA, Bussolati G, Lloyd RV. Mixed medullary-follicular carcinoma of the thyroid. A morphological, immunohistochemical and in situ hybridization analysis of 11 cases. *Virchows Arch.* 1997;430(5):397-405.
13. Nakazawa T, Cameselle-Teijeiro J, Vinagre J, Soares P, Rousseau E, Eloy C, et al. Carcinoma of the thyroid: the diagnostic importance of CGRP immunoreactivity. C cell-derived calcitonin-free neuroendocrine. *Int J Surg Pathol.* 2014;22(6):530-5.

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