ISSN: 2378-3656

Akhtarzai et al. Clin Med Rev Case Rep 2024, 11:464
DOI: 10.23937/2378-3656/1410464
Volume 11 | Issue 12
Open Access

Clinical Medical Reviews and Case Reports

CASE REPORT

Unusual Presentation of Differentiated Thyroid Collision Tumor

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Abstract

Background: Collision tumors are rare clinical entities where two histologically and morphologically distinct tumors within the same organ with no histological admixture of different tumor cells. Some of the organs implicated are the stomach, liver, adrenal gland, lungs, ovary, kidneys, and colon. The thyroid gland, collision tumors are rare existent about 1% of all thyroid malignancies with co-occurring between medullary thyroid carcinoma and papillary thyroid carcinoma [1].

Case presentation: Here in, we report a rare case of synchronous two histologically distinct thyroid tumors in a patient, a papillary thyroid cancer in left lobe and follicular thyroid cancer in right lobe of thyroid. Subclinical hyperthyroidism was diagnosed based on suppressed TSH levels and normal Free T3 and Free T4 levels. Serum Anti-Thyroglobulin and TSH-receptor antibodies were undetectable. Further investigations, including ultrasound of the thyroid gland and 99 mTechnetium uptake scintigraphy, revealed a 2.2 centimeter cold nodule in the left thyroid. Fine-needle aspiration cytology (FNAC) of the nodule confirmed the presence of papillary thyroid cancer.

Based on the multidisciplinary team's evaluation, total thyroidectomy was proposed and performed.

Histopathology examination revealed two different types of cancer, left lobe revealed 'encapsulated papillary thyroid cancer' and right lobe showed 'minimally invasive follicular cancer. Patient's post-operative period was uneventful. Hence surgery followed by a combination of adjuvant radioiodine and external radiotherapy was justified.

Conclusion: Synchronicity of papillary and follicular thyroid malignancy makes the management more challenges and mandate multidisciplinary team setting. As a high rate of recurrence of collision tumor is well recognized, managed needs to be tailored to accordingly i.e. both tumors will be treated as primary independent malignancies.

Keywords

Anti-Thyroglobulin, Sub-clinical hyperthyroidism, Collision tumors, Needle aspiration cytology, Adjuvant therapy

Introduction

Collision tumor is the occurrence of two or more histologically and morphologically distinct tumors within the same organ with no histological admixture [2].

Collision tumors of thyroid are very rare entities cancers, constituting < 1% of all thyroid tumors, papillary thyroid carcinoma (PTC) and follicular thyroid carcinoma (FTC) are common differentiated thyroid

Citation: Akhtarzai A, Mohamad S, Ibraheem N, Shikare SV, Ahmad E, et al. (2024) Unusual Presentation of Differentiated Thyroid Collision Tumor. Clin Med Rev Case Rep 11:464. doi.org/10.23937/2378-3656/1410464

Accepted: December 28, 2024: **Published:** December 30, 2024

cancers, but the detection of a collision tumor is a rare event.

Thyroid collision tumors (TCTs) with PTC and MTC are more frequently encounter in female as compare to male with F/M ratio of two to one in fifth to seventh decades of life [3].

Papillary thyroid carcinoma (PTC) and follicular thyroid carcinoma (FTC) are both differentiated types of thyroid cancers derived from thyroid follicular cells. PTC is the most common accounting for 75-80% of cases, and FTC is the second most common accounting for about 10% of all thyroid cancers [4].

Treatment guidelines for collision tumors of the thyroid are poorly defined due to the rarity of these tumors. Thus, the treatment protocol of TCTs is complex and needs to consider the stage of the tumor and morpho-pathological signs of aggressiveness for each component of the TCT. However, it is generally agreed upon that both the entities in a collision tumor should be treated as 2 separate synchronous primaries.

Case Presentation

Thirty-one year-old man presented with a new onset palpitations, dizziness and two episodes of syncope to cardiology OPD. He also reported recent weight loss of 5 kilograms following strict diet. There was no history of radiation exposure to head and neck and family history of thyroid cancer, Past medical and surgical histories were insignificant.

He underwent basic investigations including TSH along with ECG, Holter monitoring and Echocardiography, all results reports was normal except slightly suppressed TSH, for which she was referred to endocrinologist for further evaluation. On presentation to OPD, he was tachycardiac but normal BP..Patient does not have any palpable neck or cervical lymph nodes. He denied any pressure symptoms and features of thyroid eye disease. Serum Anti-Thyroglobulin and TSH-recepotor antibodies were undetectable. Ultrasound of thyroid gland was performed which showed a left thyroid nodule measuring 2.2 cm (Figure 1 and Figure 2). Technetium uptake scinitigraphy scan revealed it to be a cold nodule (Figure 3).

Doppler US scan showed a normal right lobe as well as a sharply defined hypoechoic thyroid nodule (longest diameter 22 mm) with cystic components and microcalcifications in left lobe of thyroid.

FNAC of left thyroid nodule was performed which revealed papillary thyroid category 5.

Case was discussed in multidisciplinary team setting

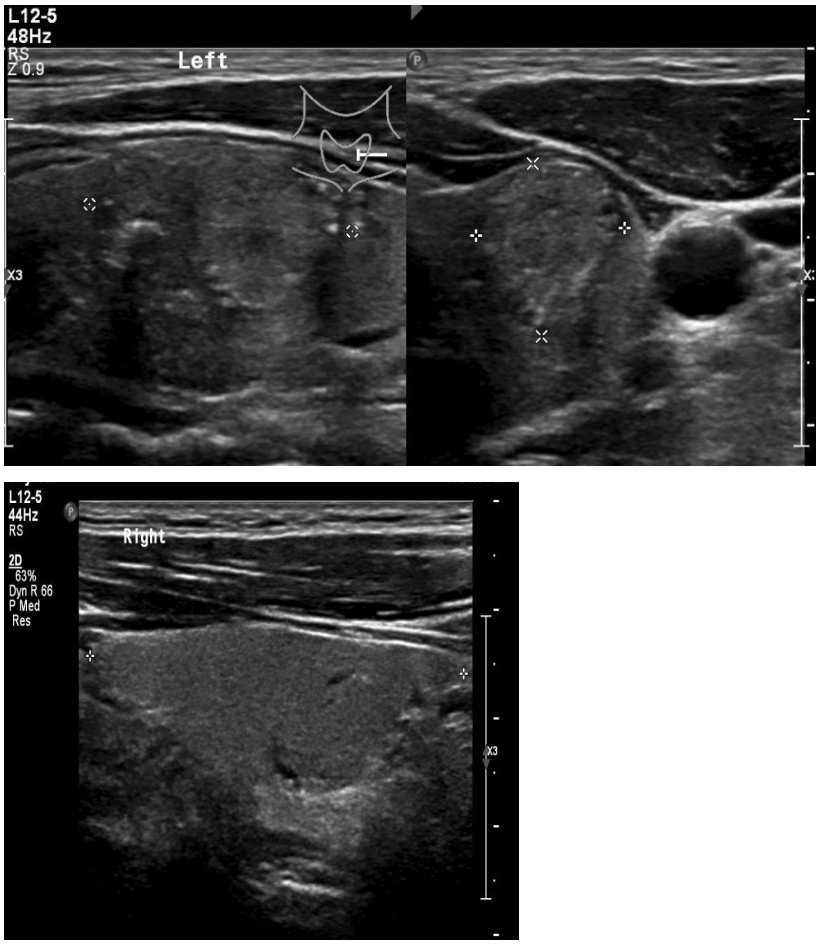

Figure 1 and Figure 2: Doppler US scan of thyroid gland showed, right lobe sharply defined hypoechoic thyroid nodule with cystic components and micro-calcifications in left lobe of thyroid.

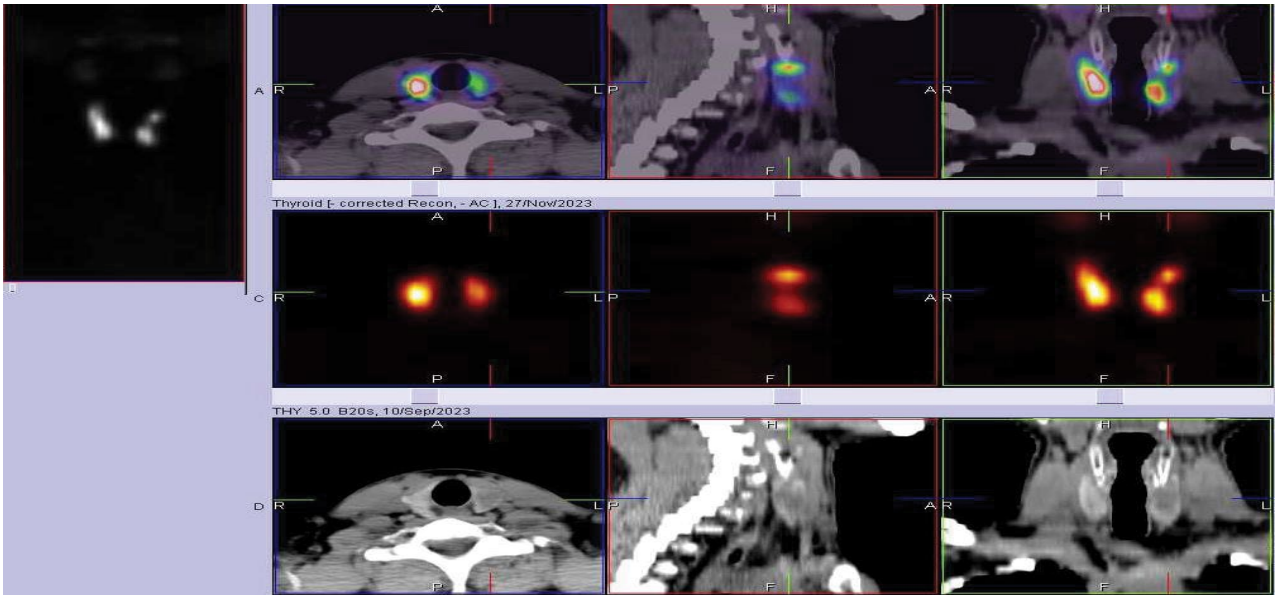

Figure 3: Technetium uptake scinitigraphy scan revealed it to be a cold nodule.

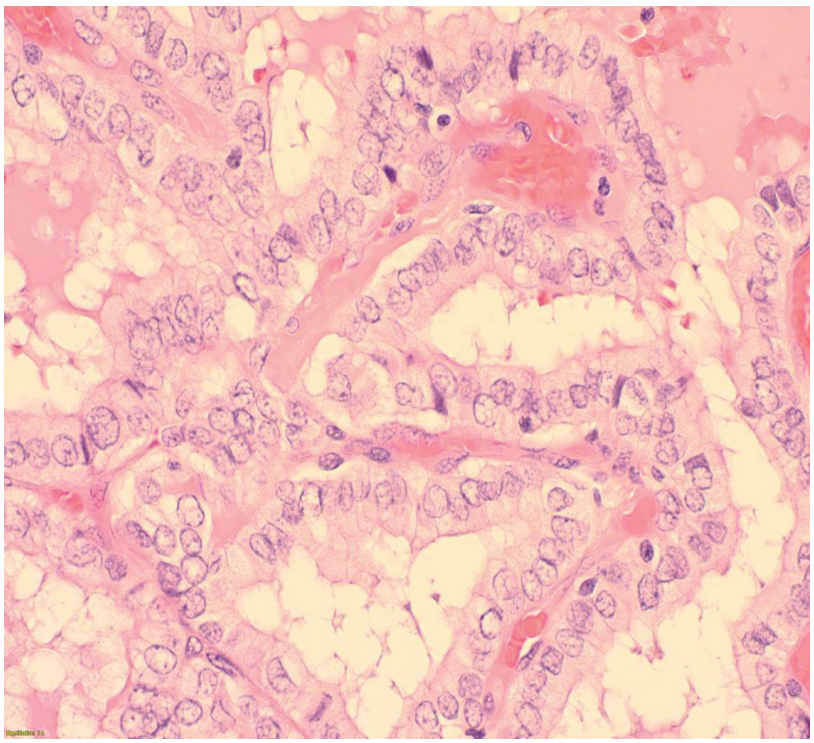

Figure 4: Figure 0-3 H&E stain 40x (high power view) illustrating the nuclear features of papillary.

and total thyroidectomy was proposed. Subsequently, considering the size of the tumor and associated risk factors, a completion thyroidectomy was planned and surgery went off smoothly without any complications. Histopathology specimen examination identified presence of two histologically neoplastic morphologies of thyroid gland. Left lobe revealed 'encapsulated papillary thyroid cancer' and right lobe showed 'minimally invasive follicular cancer 0.4 cm in diameter (Figure 4 and Figure 5).

131-iodine whole body scan (166.5 MBq scan post thyrogen injection), revealed remnant (ectopic) thyroid functioning thyroidal tissue, post thyrogen TSH 78.055, anti-tg 1.2 (NEGATIVE LESS THAN 4.5), Tg 0.82 (3.50-77.0).

Based on MDT evaluation, ablation was proposed.

Discussion

Collision tumor" refers to coexistent but independent tumors that are histologically distinct and can occur within the same organ and separated by non-neoplastic tissue without a histological mixture of the different tumor cells. Various mechanisms have been proposed for collision tumors. The first, is a "chance accidental

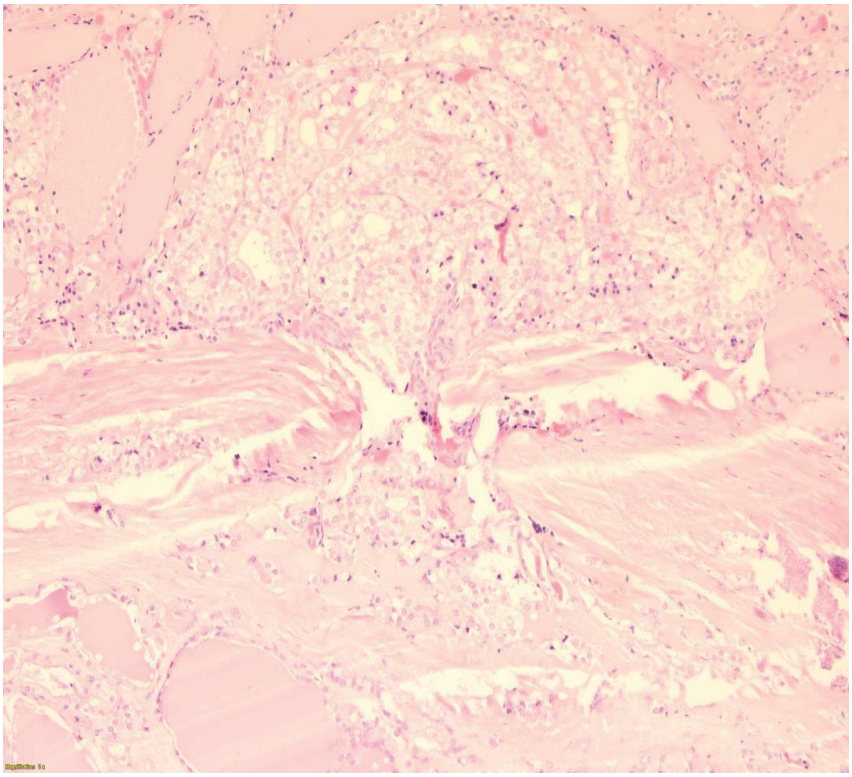

Figure 5: Figure 0-4 H&E stain 10x (low power view) showing follicular tumor with capsular invasion.

meeting" of two primary tumors. Another hypothesis suggests that the presence of the first tumor alters the microenvironment facilitating the development of the second primary tumor or seeding of metastatic tumor cells. The third theory suggests a common stem cell of origin for the two tumors [5].

Different studies results highlighted that some pathological features of the tumors, namely the focality of the tumor, extrathyroidal extension, lymphovascular invasion, perineural invasion, and lymph node metastasis, can be crucial prognostic factors in thyroid malignancies [6].

FNAC cannot distinguish between a follicular adenoma, follicular carcinoma, and follicular variant of papillary carcinoma. Multiple challenges may be encountered while dealing with a follicular neoplasm of undetermined significance. Histological type of the second tumor may further complicate treatment, and the surgeon may be completely unaware of a second malignancy at this stage, especially if it presents with no symptoms and is reported as a normal-looking thyroid gland on investigations. The diagnosis of a second primary malignancy of the thyroid can be as a surprise to the surgeon as it is usually one of histological components is known preoperatively and the other is incidentally diagnosed. But more importantly a big shock to the patient, who may already under a considerable amount of stress due to multiple investigations, surgery, and knowledge of primary malignancy [7]. Less than 50 thyroid collision tumors cases reported and only one with three different histological types in a 57-year-old female patient namely, PTC, MTC and FTC in one lobe (right lobe) has been reported. This patient had no alterations in routine preoperative examinations [8].

Conclusion

As there are no recommended protocols for the treatment of collision tumor, the clinician must be flexible in the treatment of collision tumors and should be treated like an independent primary lesion. It is important to note that preoperative investigations may not be entirely reliable in a thyroid malignancy. The most aggressive tumor out of the two should guide the management. Complete or partial thyroidectomy is the ideal management of choice.

Ethics Approval and Consent to Participate

Written approval is available with reference (REC proposal No: NMC/REC/2024/012) from Research Ethics committee.

Availability of Data and Materials

All the data are available openly.

Consent for Publication

Written consent has taken.

Competing Interests

The authors declare that they have no competing interests.

Source of Funding

None.

Acknowledgments

Not applicable.

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