Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Pathology

An Interesting Case Report of Medullary Thyroid Carcinoma Co-Exisiting with Hashimoto's Thyroiditis

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DOI: 10.36347/sjmcr.2024.v12i05.075 | **Received:** 10.04.2024 | **Accepted:** 22.05.2024 | **Published:** 25.05.2024

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Abstract **Case Report**

Medullary thyroid carcinoma (MTC) is a rare malignant tumor, which accounts for <5% of all thyroid malignancies, derived from parafollicular C cells. Hashimoto's thyroiditis, which is the most common cause of hypothyroidism is an autoimmune disease. Many studies have been done in association with Hashimoto's thyroiditis, Papillary thyroid carcinoma and thyroid lymphomas. Very few cases of Hashimoto's thyroiditis with coexisting medullary thyroid carcinoma have been reported, because of its rarity. MTC produces various tumor biomarkers mainly Calcitonin, Carcinoembryonic antigen (CEA) and Chromogranin A. For determining the severity of the condition, preoperative serum calcitonin and CEA values are crucial. Postoperatively, Serum levels of calcitonin and CEA can be used to assess for distant metastases and recurrence. Here we present a rare case of Medullary thyroid carcinoma coexisting with Hashimoto's thyroiditis.

Keywords: Medullary carcinoma thyroid, Hashomoto's thyroiditis, CEA, Calcitonin.

INTRODUCTION

Hashimoto's thyroiditis (HT) often co-exists with papillary thyroid carcinoma (PTC) and follicular thyroid carcinoma (FTC) [1]. Few studies have suggested a pathogenetic relationship between Hashimoto's thyroiditis (HT) and papillary thyroid cancer (PTC) [2]. Remarkably, occasional research has linked HT to medullary thyroid cancer (MTC) and C-cell hyperplasia, implying that HT may also have a pathogenetic connection to C-cell tumors [3]. The concurrent MTC and HT cases reported in the literature are surgical specimens [3]. Concomitant MTC and HT can be easily diagnosed histologically, although cytologic interpretation can be challenging. Parafollicular cells are classified as C cells because they generate Calcitonin, a helpful biomarker in MTC [4]. Like other neuroendocrine tumors, MTC can also produce Chromogranin A, Neuron-specific enolase, Catecholamine, and other biochemical markers [5]. The well-known biomarker for MTC among them is Carcinoembryonic antigen (CEA) [2]. According to current recommendations, serum calcitonin and CEA levels should be combined to assess MTC [3]. The parafollicular or C-cell mass directly correlates with the serum levels of these indicators. Elevated serum CEA levels facilitate the prediction of recurrence and metastasis [3]. Here, we present an interesting case report of Medullary thyroid carcinoma with co existing Hashimoto's thyroiditis.

CASE REPORT

A 42 year old female presented to the surgical outpatient department with complaints of swelling in front of neck since four years, which showed progressive increase in size. She was a known case of hypothyroidism with elevated TSH, on treatment. There was no significant family history.

On examination a well-defined swelling was present in front of the neck measuring 3.5x2cms, moving with deglutition, hard in consistency, smooth surfaced, and non-tender.

Ultrasonography revealed multiple heterogenous, iso to hyperechoic nodules with calcific foci in bilateral lobes of thyroid gland, of which largest measured 3.5x2.2cms in right lobe of thyroid. An

impression of suspicious of malignancy with TIRADS 5 was given.

Fine needle aspiration cytology was performed which yielded very little blood-mixed colloid material. On microscopy, few thyroid follicular cells with colloid mixed hemorrhage was seen. An impression of Adenomatous goitre was suggested.

With these findings, Total thyroidectomy was performed. We received total thyroidectomy specimen, which weighed 35grams and measured 6.5x6.5x2.5cms. Cut section of the right lobe showed an irregular lobulated brownish coloured lesion of 3x2cms along with grey white area measuring 1x1cm (Fig 1 & 2). Surrounding tissue showed normal thyroid. Cut section of left lobe showed firm, grey white areas measuring 1x1cm. A single cervical lymph node measuring 0.5x0.5 cm was also received.

Histological examination of the right lobe showed a circumscribed nodular area with tumor cells arranged in sheets and nests separated by fibrocollagenous stroma (Fig 3). The tumor cells are mostly small, round, uniform with salt and pepper chromatin (Fig 4). Few of the cells are plasmacytoid (Fig 5) with eosinophilic cytoplasm. Focally tumor showed homogenous extracellular eosinophilic material (Fig 6), increased vascularity and areas of calcification (Fig 7). Adjacent thyroid showed multiple nodules separated by fibrocollagenous tissue and large number of lymphoid aggregates, few with germinal centres (Fig 8). This is diagnosed as Medullary carcinoma of thyroid associated with Hashimoto's thyroiditis. Sections from the remaining thyroid gland showed features of Hashimoto's thyroiditis and sections from cervical lymph node revealed reactive lymphadenitis.

Post operatively, after histological diagnosis was given and after the discussion with clinicians and operating surgeon, CEA and calcitonin values were evaluated. CEA was 36.30ng/ml (normal: 0-2.9ng/ml) and Calcitonin was 4.20pg/ml (normal: <14pg/ml). For confirmation paraffin embedded block was submitted for immunohistochemistry. IHC marker Calcitonin was done and revealed a score of 4+ (immunoreactivity in 76-100% cells) which confirmed the diagnoses of Medullary carcinoma.

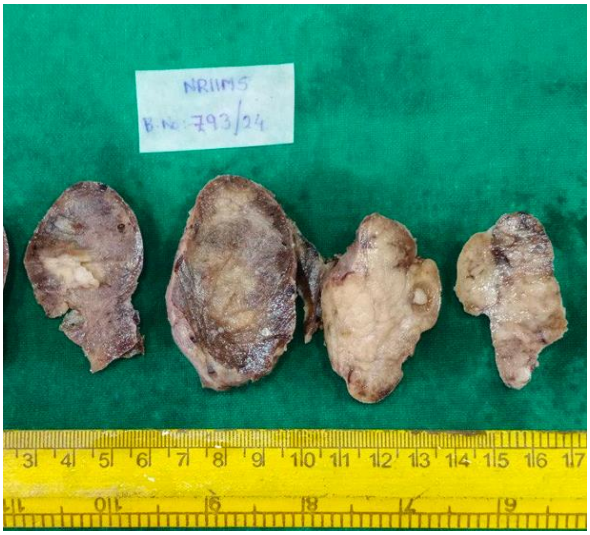

Fig 1: Cut section of total thyroidectomy

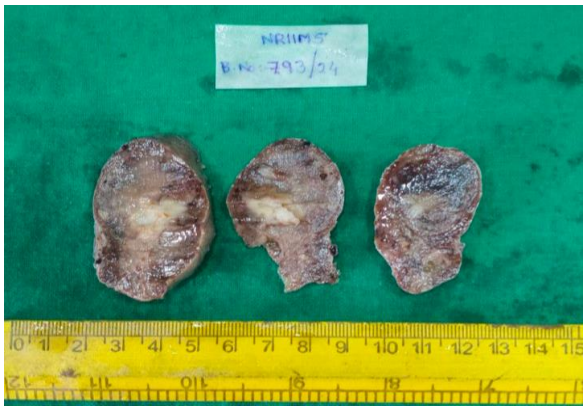

Fig 2: Cut surface of right lobe showing an irregular lobulated brownish coloured nodule measuring 3x2cms and rest showing thyroid tissue along with grey white areas measuring 1x1cm

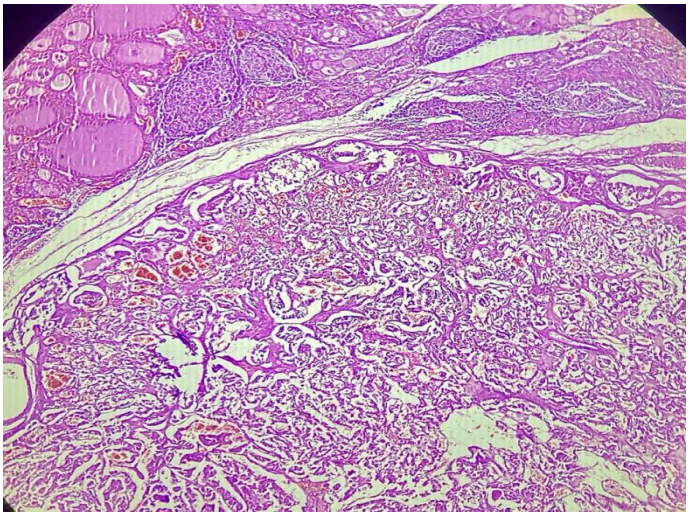

Fig 3: Showing co existing Hashimoto's thyroiditis and Medullary thyroid carcinoma (H&E,10X)

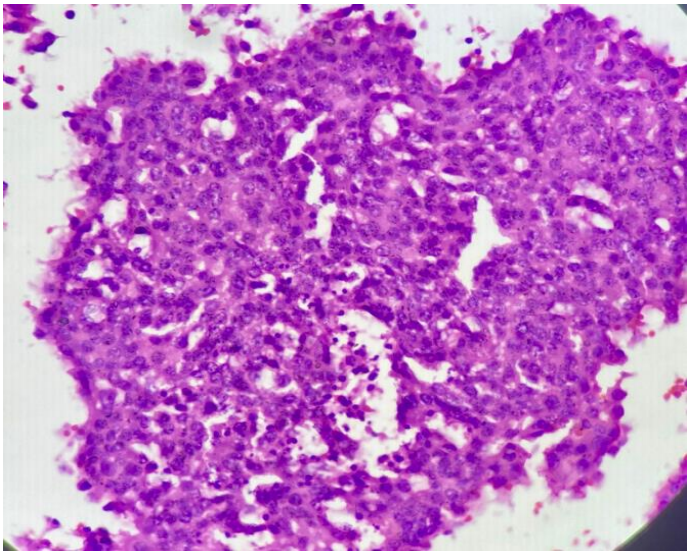

Fig 4: Showing sheets of tumor cells with salt and pepper chromatin (H&E,40X)

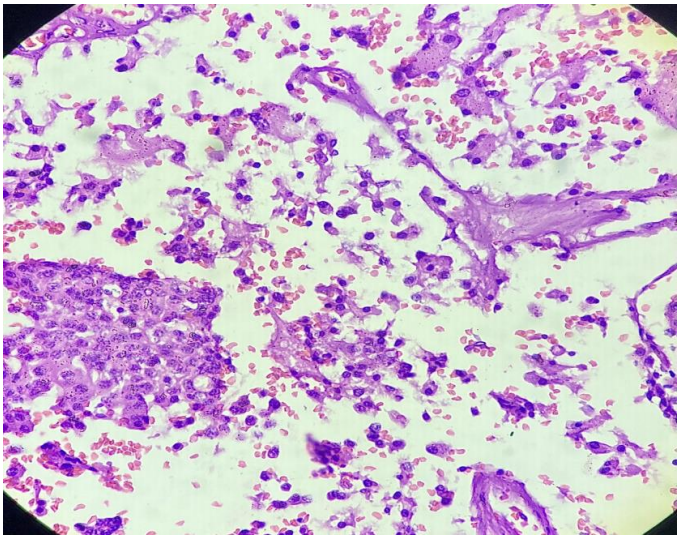

Fig 5: Showing plasmacytoid cells (H&E,40X)

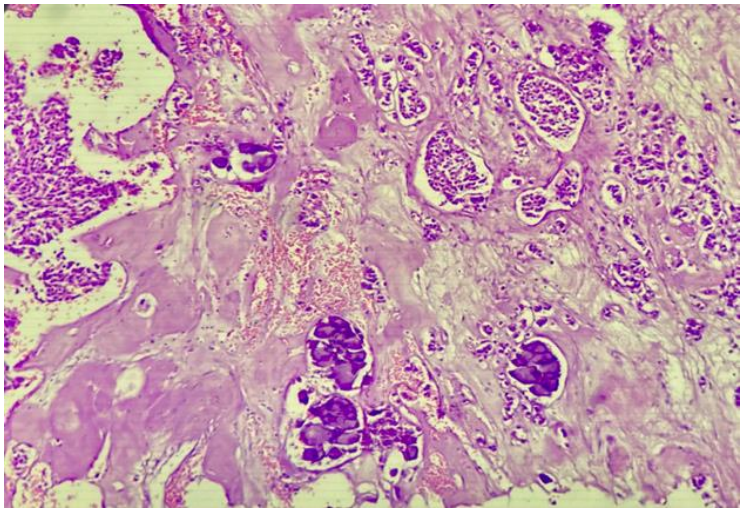

Fig 6: Showing homogenous extracellular eosinophilic material and areas of calcification (H&E, 10x)

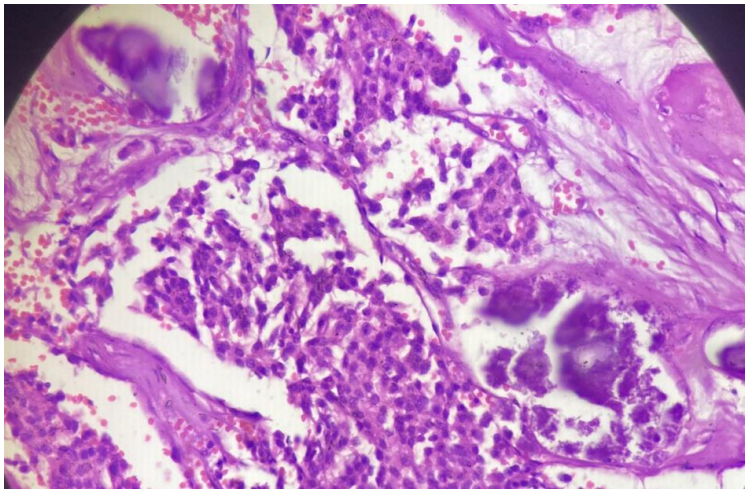

Fig 7: Showing tumor component along with areas of calcification (H&E,40X)

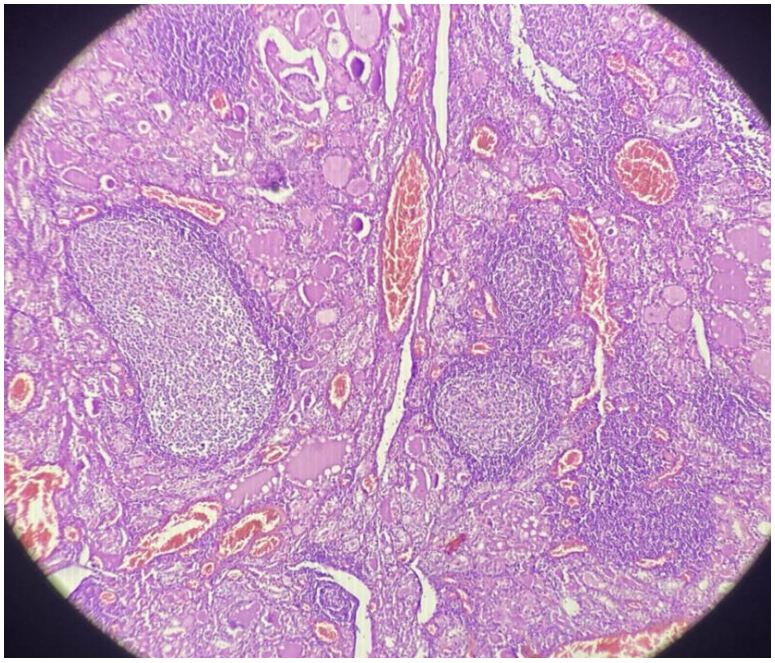

Fig 8: Rest of the thyroid showing Hashimoto's thyroiditis (H&E,40X)

DISCUSSION

Medullary carcinoma of thyroid is a rare neuroendocrine tumor derived from parafollicular C-cell origin and can be either sporadic or hereditary [6]. 70% cases are sporadic forms and occur in the 4-5th decade of life, while 30% are familial and arise at an earlier age [4]. These tumors generate much interest among clinicians because of their hereditary predisposition and association with multiple endocrine neoplasia (MEN) syndromes [7]. The tumor may rarely arise in the setting of Hashimoto thyroiditis, but this association is probably co-incidental [2]. MTCs are typically located in upper and middle regions of thyroid lobes, where C cells are normally concentrated [2].

The most interesting feature of our case was noticeable coexistence of MTC with Hashimoto's thyroiditis .As in our case, there was no clinical suspicion of medullary thyroid carcinoma and Hashimoto's thyroiditis, Tumor markers were not performed pre-operatively. One of the most significant markers for monitoring MTC patients is Carcinoembryonic antigen (CEA), which is especially helpful for patients whose tumors produce less calcitonin [2]. In rare cases, the tumor is incidentally discovered on investigation of unexplained elevated serum Carcinoembryonic antigen (CEA) levels [4]. Patients with concurrent thyroid carcinomas and Hashimoto's thyroiditis are said to have a better prognosis than those with thyroid carcinomas alone [1]. It is hypothesized that in certain cases, thyroid carcinomas stimulate the development of Hashimoto's thyroiditis and that the circulating antibodies and autoimmune inflammatory response impede the growth and spread of malignant cells [1]. High levels of serum CEA has increased risk of recurrence and lymph node metastasis [8]. In our case there is high levels of serum CEA levels post operatively, but lymph nodeshow reactive lymphadenitis.Cases where TIRADS-5 is noted, serum Calcitonin and CEA levelsshould be sent pre-operatively to diagnose malignancies at the earliest. Recurrence of Medullary thyroid carcinoma and lymph node metastasis should be suspected in patients with high CEA levels even after surgery.

CONCLUSION

Medullary thyroid carcinoma is a rare thyroid malignancy and MTC with co existing Hashimoto's thyroiditis is even rarer. In case of suspected medullary carcinoma of thyroid pre-operative CEA and Calcitonin levels may be useful in the diagnosis.

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