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Case Series
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Association Between Primary Hyperparathyroidism and Thyroid Carcinoma: A Case Series of Three Patients

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Abstract

The association between primary hyperparathyroidism (PHPT) and non-medullary thyroid carcinoma is rare and is most often discovered incidentally during surgical exploration or histopathological examination. We report a case series of three patients presenting with thyroid carcinoma associated with primary hyperparathyroidism. We describe the clinical presentation, imaging findings, surgical management, and histopathological features. This coexistence raises pathophysiological questions and highlights the importance of systematic thyroid evaluation in patients undergoing surgery for PHPT.

Keywords: Primary Hyperparathyroidism; Papillary Thyroid Carcinoma; Parathyroid Adenoma; Thyroidectomy; EU-TIRADS

Introduction

Primary hyperparathyroidism is a common endocrine disorder, most frequently caused by a parathyroid adenoma, leading to chronic hypercalcemia [1]. Papillary thyroid carcinoma represents the most frequent endocrine malignancy and is generally associated with an excellent prognosis [2].

The coexistence of primary hyperparathyroidism and non-medullary thyroid carcinoma is uncommon, with a reported prevalence ranging from 2% to 11% depending on the series [3]. In most cases, thyroid carcinoma is diagnosed incidentally on histopathological examination following thyroidectomy performed during parathyroid surgery [4].

We report three cases of thyroid carcinoma associated with primary hyperparathyroidism and discuss the diagnostic, therapeutic, and pathophysiological aspects of this association.

Case Reports

Case 1

A 53-year-old female patient was admitted for the management of primary hyperparathyroidism. Cervical ultrasound revealed a right subthyroid nodule suggestive of a parathyroid adenoma, associated with a multinodular goiter classified as EU-TIRADS 3–5.

Cervical computed tomography showed two right lobar nodules, superior and inferior. Thyroid-parathyroid scintigraphy confirmed the superior and inferior right parathyroid origin of the lesions.

The patient underwent superior and inferior right parathyroid adenomectomy associated with total thyroidectomy.

Histopathological examination revealed a parathyroid adenoma associated with papillary thyroid carcinoma.

Case 2

A 63-year-old female patient with a history of recurrent bilateral nephrolithiasis was admitted for management of primary hyperparathyroidism.

Localization studies identified a left inferior parathyroid nodule associated with a multinodular goiter classified as EU-TIRADS 5.

The patient underwent left inferior parathyroidectomy combined with total thyroidectomy. Histopathological analysis demonstrated a parathyroid adenoma associated with a papillary thyroid

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Table 1: Clinical, imaging, surgical, and histopathological characteristics of the patients.

Parameters	Case 1	Case 2	Case 3
Age (years)	53	63	66
Sex	Female	Female	Female
Clinical context	Isolated PHPT	Recurrent nephrolithiasis	End-stage CKD
Parathyroid location	Right superior + inferior	Left inferior	Right
EU-TIRADS classification	3–5	5	4
Surgical procedure	PT + TT	PT + TT	PT + TT
Parathyroid histology	Adenoma	Adenoma	Adenoma
Thyroid carcinoma type	PTC	Papillary microcarcinoma	PTC
Tumor stage	pT1	pT1a	pT1b

Abbreviations: PHPT: Primary hyperparathyroidism; PT: Parathyroidectomy; TT: Total thyroidectomy; PTC: Papillary thyroid carcinoma; CKD: Chronic kidney disease.

microcarcinoma measuring 0.6 × 0.7 mm, without adverse prognostic features.

Case 3

A 66-year-old female patient with end-stage chronic kidney disease on hemodialysis was followed for primary hyperparathyroidism.

Localization studies revealed a right parathyroid nodule associated with suspicious multinodular thyroid disease classified as EU-TIRADS 4.

The patient underwent total thyroidectomy associated with right parathyroidectomy. Histopathological examination revealed a parathyroid adenoma associated with thyroid carcinoma classified as pT1bNxMx.

Results

See Table 1.

Discussion

The association between primary hyperparathyroidism and non-medullary thyroid carcinoma is rare but well documented in the literature [3, 5]. In most reported cases, thyroid carcinoma is incidentally discovered during histopathological examination following thyroidectomy [6].

Several hypotheses have been proposed to explain this association, including a shared embryological origin, common genetic alterations, the mitogenic effect of elevated parathyroid hormone levels, chronic hypercalcemia, and vitamin D deficiency promoting angiogenic growth factors [7, 8].

These findings support the need for careful preoperative thyroid evaluation in patients with primary hyperparathyroidism, particularly when suspicious thyroid nodules are identified on imaging studies [9].

Conclusion

The coexistence of primary hyperparathyroidism and non-medullary thyroid carcinoma, although uncommon, should be recognized by clinicians. Systematic thyroid evaluation before parathyroid surgery is essential to optimize surgical strategy and avoid reoperations.

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