

Combined parathyroid adenoma and an occult papillary carcinoma

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ABSTRACT

Although the pathological association of thyroid and parathyroid disease is common, the association of both parathyroid adenoma and thyroid cancer is rare. We report here a case of a 45-year-old Saudi woman who was diagnosed to have primary hyperparathyroidism due to a single parathyroid adenoma as confirmed biochemically and radiologically. At operation, the adenoma was found to be an intrathyroid and therefore a thyroid lobectomy was performed. Histology of the excised lobe revealed in addition to the intrathyroid parathyroid adenoma a concurrent occult thyroid papillary carcinoma. This interesting association is discussed based on a literature review.

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The pathological association of thyroid and parathyroid disease is not rare and is commonly encountered in thyrotoxic goitre or after head and neck irradiation¹⁻⁴. Therefore, measurement of preoperative level of parathyroid hormone in patients undergoing thyroidectomy has been advocated⁵ so that both pathologies are diagnosed and dealt with simultaneously. This association can not be attributed entirely to irradiation; as experience review of a group of 40 individuals harboring both tumors showed evidence of x-ray exposure to the head and neck in only one patient.⁶ The concurrence of a parathyroid adenoma and a differentiated thyroid tumor is extremely rare. We describe here a case of an association of primary hyperparathyroidism due to a parathyroid adenoma and an occult differentiated thyroid carcinoma that was diagnosed histologically after thyroid lobectomy for an intrathyroid parathyroid adenoma.

Case Report. A 45-year-old Saudi woman presented with 2 years history of recurrent attacks of abdominal pain and polyarthralgia. She had a history of hypertension and diet-controlled diabetes

mellitus. She denied any history of past neck irradiation. Clinical examination was unremarkable. Her baseline investigations revealed high serum calcium at 12.7mg/dl, and a very high parathyroid hormone of 444pg/ml (normal range 49-121pg/ml), but normal thyroid function test. Ultrasonography of the neck revealed a small lump in the left thyroid gland, which could represent a thyroid or parathyroid adenoma. Computerized tomography (CT) scan of the neck revealed a well-defined low attenuated lesion, 12x9mm at the posterior part of the upper part of the left thyroid lobe, which could represent the left upper parathyroid gland. Thallium-technetium subtraction scan followed by ^{99m}Tc methoxyisobutylisonitrile (MIBI) parathyroid scintigraphy showed an increased tracer uptake over the left lobe of the thyroid gland with relatively reduced uptake in the remaining portion of the thyroid gland. Subtracted images revealed a hot area in the upper pole of the left thyroid lobe. Both the subtraction scan and the MIBI scan were suggestive of parathyroid adenoma involving the upper pole of the left thyroid lobe (**Figure 1**).

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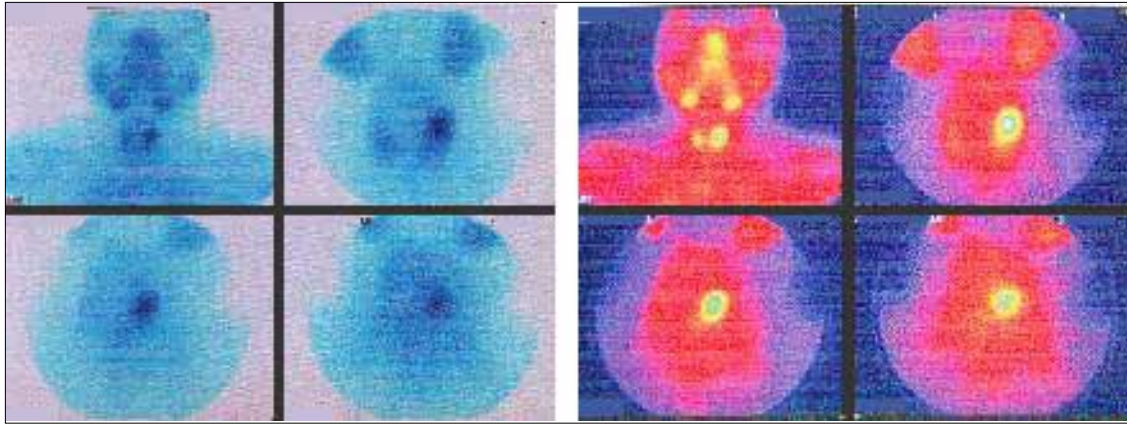


Figure 1 - Thallium-technetium subtraction and ^{99m}Tc MIBI scintigraphy scans suggestive of parathyroid adenoma at the upper pole of the left thyroid lobe.

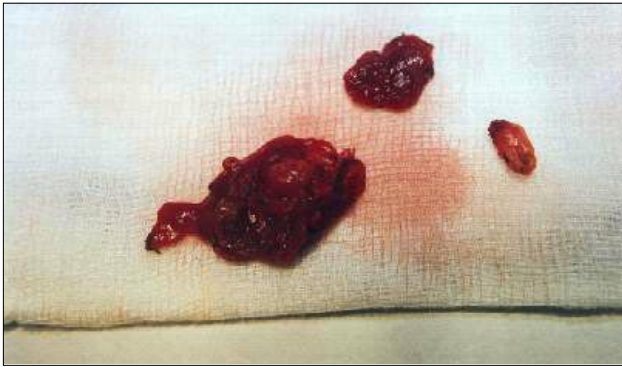


Figure 2 - The excised left thyroid lobe (lobectomy specimen) showing the intrathyroid parathyroid gland adenoma.

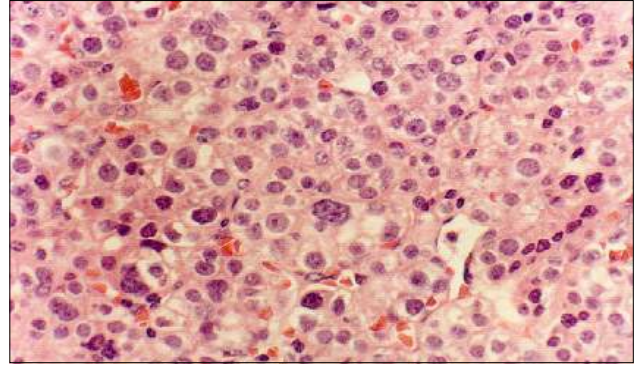


Figure 4 - The parathyroid adenoma showing prominent chief cell population exhibiting nuclear pleomorphism and binucleation (hematoxylin & eosin x 400).

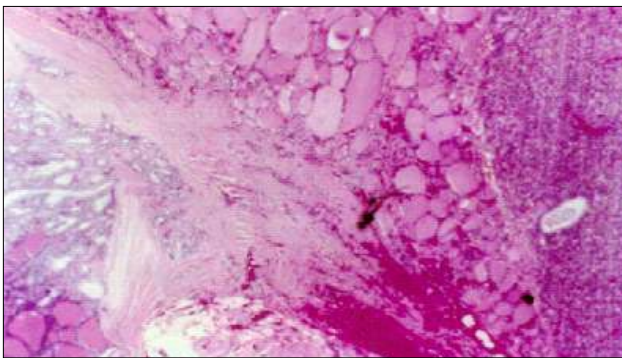


Figure 3 - A micrograph showing papillary micro-carcinoma (left side) and parathyroid adenoma (right side) with intervening colloid-filled thyroid acini (hematoxylin & eosin x 40).

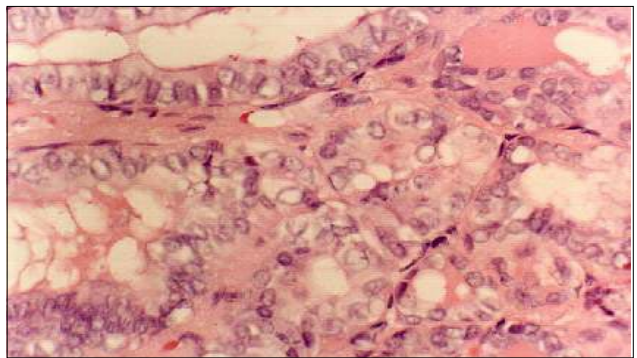


Figure 5 - The thyroid papillary micro-carcinoma showing ground glass nuclei exhibiting overlapping, occasional grooves and intranuclear inclusions (hematoxylin & eosin 400).

Neck exploration revealed normal texture of the left lobe except for a slightly firm area at the lower lobe near the isthmus. The left inferior parathyroid looked hyperplastic, but the left superior parathyroid gland could not be found. There was however, a palpable lump within the left thyroid lobe, which corresponded to the CT and isotope scan findings and was felt to represent an intrathyroid parathyroid adenoma. A left thyroid lobectomy and isthmusectomy was performed together with excision of the hyperplastic inferior parathyroid. Back table dissection of the thyroid lobe confirmed presence of intrathyroid parathyroid adenoma (Figure 2). Her postoperative serum calcium reverted to normal and her symptoms improved dramatically. The histology revealed an intrathyroid parathyroid adenoma (3x1.7x3cm) and the thyroid lobe contained an occult papillary carcinoma less than 5mm (Figures 3, 4 & 5). She remained well and normocalcemic at 24-month follow-up.

Discussion. The occurrence of parathyroid adenoma in a case of thyroid papillary carcinoma is rare.⁷ In such a case, the adenoma may be misdiagnosed preoperatively as a metastatic lymph node.⁷ In our case the parathyroid adenoma was difficult to distinguish from a thyroid nodule as the lesion was intrathyroid. As the association of hyperparathyroidism in patients with thyroid diseases is high, examination of not only serum levels of calcium and parathyroid hormone but also careful interpretation of CT scan or nuclear magnetic resonance imaging is necessary in the diagnosis of co-existing asymptomatic hyperparathyroidism.⁷ In our case there was no evidence of thyroid disease preoperatively and the thyroid pathology was only discovered histologically. This was made possible only due to the performance of the thyroid lobectomy, as the parathyroid adenoma was intrathyroid; otherwise, the occult thyroid carcinoma could have been missed.

Such an association is rare; in a series of 144 patients with parathyroid adenoma, only 11 (8%) were found to have concurrent thyroid carcinoma.⁸ It was felt to be at that time of high incidence but was not well-known and of inadequately understood coexistence. The 2 tumors have no common embryologic cell origin and therefore the most likely explanation is the specific oncogenic effect of hypercalcemia on the thyroid gland.⁹ The diagnostic difficulties in differentiating parathyroid adenoma from well-differentiated thyroid carcinoma are well recognized and the published literature emphasizes similar difficulties, and that the final diagnosis can be established only on histopathologic sections¹⁰ as seen in our patient.

The occasional coexistence of papillary carcinoma of the thyroid with nodular goiter or hyperparathyroidism may in some cases result in a

significant discrepancy between the clinical impression and the fine needle aspiration (FNA) biopsy diagnosis, leading to the suspicion that a false-positive FNA diagnosis was obtained.¹¹

Our case also confirms the importance of ^{99m}Tc MIBI-scintigraphy in detection and preoperative localization of parathyroid adenoma in difficult cases of hyperparathyroidism. It is easy to perform, cost-effective and has high accuracy in detection and localization of parathyroid adenomas in patients with primary hyperparathyroidism and hence, it should be the primary localization technique for minimally invasive parathyroidectomy.¹² It offers several technical and interpretative advantages over thallium. Similar to thallium, MIBI accumulates in both the thyroid and parathyroid glands with a peak activity at 4-6 minutes after injection. Both tracers wash out from the thyroid gland quickly; yet unlike thallium, MIBI is retained in abnormal parathyroid, facilitating visualization. The sensitivity of MIBI scintigraphy ranges from 88-100%.^{13,14}

This case is reported to highlight the interesting concurrence of parathyroid adenoma and thyroid papillary carcinoma and to emphasize the pathological association of thyroid and parathyroid diseases and the important role of parathyroid MIBI-scintigraphy in detection and localization of parathyroid adenoma.

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