Coexistence of Papillary Thyroid Cancer and Primary Hyperparathyroidism: Report of Five Cases

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Abstract

Coincidence of primary hyperparathyroidism and thyroid nodules is quite frequent. This is challenging for clinical diagnosis and treatment. We reviewed the records of patients who underwent surgery for primary hyperparathyroidism. Among 52 such cases, thyroidectomy was performed in seven patients (13%) at the same time. Papillary thyroid cancer was detected in five patients (9.6%) as a result of pathologic examination. Two patients were diagnosed with unifocal micro-papillary cancer and these patients underwent unilateral thyroid lobectomy. The remaining three patients, who had thyroid papillary cancer underwent bilateral total thyroidectomy. Likelihood of thyroid cancer should be considered in cases of primary hyperparathyroidism with coexistent thyroid nodules, and a detailed examination should be performed in preoperative period. These will lead to reduce morbidity and lower cost resulting from a second surgery.

Key Words: *Thyroid cancer, Hyperparathyroidism, Micropapillary cancer.*

INTRODUCTION

Primary hyperparathyroidism is the most common cause of hypercalcemia. Coincidence of primary hyperparathyroidism and thyroid nodules is quite frequent; the rate varies from 12% to 52%. This is challenging for clinical diagnosis and treatment.[1]

Limited number of cases have been reported in literature on coincidence of primary hyperparathyroidism and thyroid cancer. Therefore, it requires further investigation. We, herein, describe our experience of cases which were detected to have thyroid cancer among patients who underwent surgery for primary hyperparathyroidism.

CASE REPORT

Records of patients who underwent surgery for primary hyperparathyroidism at Ahi Evran University Research and Training Center between November 2014 and June 2017 were evaluated retrospectively. Patients who underwent thyroidectomy at the same time and were reported as a result of the final pathology as thyroid cancer were included in the study. Patients with parathyroidectomy due to prior parathyroid adenoma, with MEN (Multiple endocrine neoplasia) syndrome, and under 18 years of age were not included in the study.

Preoperative cervical ultrasonography and 99m Tc-MIBI (methoxyisobutylisonitrile) scan were performed in all patients. Ultrasound-guided fine needle aspiration biopsy (FNAB) was performed in case of suspicion of malignancy. Pathological assessment was done in accordance with Bethesda classification. Intraoperative frozen section pathologic examination was done in the course of the excision of parathyroid adenoma for patients who were suspected to have thyroid carcinoma. Thyroidectomy was performed in patients with the pathology result of malignancy or suspicious for malignancy. Informed consent was obtained from all patients in the preoperative period.

A total of 52 patients were operated with diagnosis of primary hyperparathyroidism. Among them, thyroidectomy was performed in seven patients (13%) at the same time. Among these, papillary thyroid cancer was detected in five patients (9.6%) as a result of pathology examination. Four patients were females and one was male.

Two patients were diagnosed with unifocal micropapillary cancer and these patients underwent unilateral total thyroidectomy (microcancer diameter was 0.40 and 0.48 mm). Preoperative FNAB result was reported as colloid and benign follicular cells. The remaining three patients, who had thyroid papillary cancer, underwent bilateral total thyroidectomy. Patient characteristics are presented in Table I. No patients had metastasis.

Case 1: A 42-year female patient had parathyroid and thyroid pathology. A unilateral 9 mm microcalcifed nodule was detected on ultrasonography. FNAB result of thyroid nodule was reported as colloid and benign-appearing follicular cells. Parathyroid adenoma excision and unilateral thyroid lobectomy was performed as the frozen section pathologic examination was reported as malignant (Papillary thyroid microcarcinoma, tumor diameter 0.40 mm and unifocal). No additional surgery was performed.

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Table I: Demographic, radiological and pathological characteristics of patients.

Patient	Gender	Age (years)	Focality of tumour	FNAB*	FSPE**	Final thyroid pathology	Parathyroid pathology	USG***
1	Female	42	Unifocal	Colloid and benign-appearing follicular cells	Malignant	Papillary thyroid microcarcinoma	Adenoma	Unilateral 9 mm microcalcified nodule
2	Female	76	Unifocal	Benign appearing follicular cells	Malignant	Papillary thyroid microcarcinoma	Adenoma	Unilateral 8 mm microcalcified nodule
3	Male	32	Bifocal	Atypia of undetermined significance	Suspected malignancy	Papillary thyroid carcinoma	Adenoma	14 mm hypoechoic microcalcified nodule
4	Female	48	Multifocal	Malignant	None	Papillary thyroid carcinoma	Adenoma	Nodule with 20 mm hypoechoic peripheral calcification
5	Female	50	Multifocal	Malignant	None carcinoma	Papillary thyroid	Adenoma	Nodule with 15 mm hypoechoic peripheral calcification

**FNAB: Fine needle aspiration biopsy; **FSPE: Frozen section pathologic examination; ***USG: Ultrasonography.*

Case 2: A 76-year female patient presented with dual parathyroid and thyroid pathology. A unilateral 8 mm microcalcified nodule was detected on ultrasonography. FNAB result of thyroid nodule was reported as benign appearing follicular cells. Parathyroid adenoma excision and unilateral thyroidlobectomy was performed as frozen section pathologic examination was reported as malignant (Papillary thyroid microcarcinoma, tumor diameter 0.48 mm and unifocal). No additional surgery was performed.

Case 3: A 32-year male patient was diagnosed with both parathyroid and thyroid pathology. A hypoechoic micro-calcified 14 mm nodule was detected on ultra-sonography. FNAB result of thyroid nodule was reported as 'atypia of undetermined significance'. Parathyroid adenoma excision and bilateral total thyroidectomy was performed as frozen section pathologic examination was reported as suspicious for malignancy. The final pathologic examination showed a bifocal papillary thyroid carcinoma.

Case 4: A 48-year female patient presented with both parathyroid and thyroid pathology. A nodule with 20 mm hypoechoic peripheral calcification was detected on ultrasonography. FNAB result of thyroid nodule was reported as malignant. Parathyroid adenoma excision and bilateral total thyroidectomy was performed. The final pathologic examination showed multicentric papillary thyroid carcinoma.

Case 5: A 50-year female patient presented with dual parathyroid and thyroid pathology. A nodule with 15 mm hypoechoic peripheral calcification was detected on ultrasonography. FNAB result of thyroid nodule was reported as malignant. Parathyroid adenoma excision and bilateral total thyroidectomy was performed. The final pathologic analysis revealed multicentric papillary thyroid carcinoma.

DISCUSSION

Previous studies have shown that some cancers, like hematological, breast and urinary system malignancies are common in patients with primary hyperparathyroidism.[2] Coexistence of parathyroid adenoma and thyroid cancer has been reported with a wide range (3%-70%). In these patients, thyroidectomy was performed concurrently with parathyroid adenoma excision in 13% of the cases. Thyroid cancer was detected in 9.6% of patients as a result of pathologic examination. The wide range of prevalence may be reflective of varying as diagnostic methods, indications for surgery and differences between patient selection criteria.[3,4] In the light of these data, the question arises that "Is primary hyper-parathyroidism a risk factor for thyroid cancer?" Primary hyperparathyroidism is not considered as a risk factor for thyroid cancer in American Thyroid Association (ATA) guideline.[5] The wide range of the coexistence of parathyroid adenoma and thyroid cancer (3%-70%) nullifies the hypothesis that parathyroid adenoma is a risk factor for thyroid cancer. Prospective studies conducted on large number of patients are required for better understanding the relationship of hyper-parathyroidism with thyroid cancer.

FNAB is widely used for diagnosis of malignancy in thyroid nodules. FNAB may yield false negative results in nodules smaller than 10 mm; although, it is the most valuable diagnostic tool for papillary thyroid cancer.[6,7] In a study, almost 39% of thyroid cancers were shown to be 10 mm or smaller. In addition, regional lymph node metastasis was reported in 1.6%-3.3% of the patients who had nodules measuring 6-10 mm.[8]

In case of suspicion, ultrasound-guided FNAB should be performed for nodules smaller than 10 mm.[5] Indications for FNAB were used according to ATA 2015 guidelines in these patients' group. Thyroid nodules were smaller than 10 mm in only two patients (8 and 9 mm) and micro-calcifications were detected. In both FNAB results, it was reported as benign. Unilateral thyroid lobectomy was performed as frozen section pathologic examination was reported as malignant (tumor diameter, 0.40 and 0.48 mm and unifocal). No additional surgery was performed as tumor diameter was 0.40 and 0.48 mm. Lobectomy alone is sufficient, if history of head and neck surgery, familial thyroid carcinoma or clinically detectable lymph node metastasis are not present in small, unifocal intra-thyroidal carcinomas.[5]

Preoperative FNAB should be performed in patients with primary hyperparathyroidism, who have thyroid nodules smaller than 10 mm, if there is risk of malignancy according to ultrasonography findings. Intraoperative palpation of thyroid nodule and frozen section pathologic examination should be done even if FNAB result is benign. Serious problems may be encountered, if diagnosis of thyroid cancer is overlooked in cases of coexistence of parathyroid adenoma and thyroid cancer. Recurrent laryngeal nerve injury and hypoparathyroidism, which may result from a second surgical intervention, are the most important complications.

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