COEXISTENCE PARATHYROID ADENOMA AND PAPILLARY THYROID CARCINOMA: 5 CASES

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ABSTRACT

Aim: Our aim in this study is to present 5 cases with parathyroid adenoma and coexisting PTC accompanied by the information available in literature.

Materials and methods: Of the 106 patients who had surgery for primary hyperparathyroidism at Atatürk University Medical Faculty General Surgery Department between 2006 and 2013, the data of 5 patients who had pathologically identified incidental thyroid papillary microcarcinoma after total thyroidectomy with parathyroid adenoma excision was evaluated retrospectively.

Results: Two of the patients included in the study were male, 3 were female and the average age was 52.4 years. Calcium levels were high in 3 patients preoperatively. Parathyroid hormone levels were high in 4 patients. Neck ultrasonography was performed for all patients. Parathyroid scintigraphy was performed in one patient who was suspected of having a parathyroid adenoma. All 5 patients had total thyroidectomy performed with parathyroid adenoma excision. One patient later had central lymph node dissection. Temporary hypocalcaemia developed in 2 patients during the postoperative period. There was no nerve injury or permanent hypocalcaemia observed. The tumor of one patient with detected papillary micro carcinoma was larger than 1 cm.

Conclusion: The thyroid tissue should be evaluated carefully and pathological evaluation with needle biopsy should be performed in patients having surgery for primary hyperparathyroidism.

Key words: parathyroid adenoma, incidental, thyroid papillary carcinoma.

Received June 18, 2014; Accepted April 02, 2015

Introduction

Primary Hyperparathyroidism (PHPT) is seen in an estimated incidence of 0.015 per 100,000 population and an estimated prevalence of .005% in the United States and is the third most common endocrine disease. It is particularly more common in advanced age with a female/male ratio of 3/1. Although asymptomatic disease is common, removal of the hyperfunctional nodule is the method of treatment. Clinical presentation is variable in symptomatic patients. It usually presents with hypercalcemia. However, it can also be seen with or without kidney stones, bone disorders and gastrointestinal complaints. The most common cause of PHPT with a rate of 95% is a single adenoma in the parathyroid gland.

Papillary Thyroid Carcinoma (PTC) is the most common cancer of the thyroid. PTC can either originate from a single nodule or be multifocal, its incidence is higher in women. Even though non-medullary thyroid carcinoma (NMTC) with PHPT has been reported at a rate of 2.3-4.3%, the coexistence of parathyroid adenoma and incidental PTC is very rare.

Our aim in this study is to present 4 cases with parathyroid adenoma and coexisting PTC accompanied by the information available in literature.

Materials and methods

The 106 patient with PHPT cases that were operated on at Atatürk University Medical Faculty Department of General Surgery between 2006 and
2013 were evaluated retrospectively. The demographic data, preoperative and postoperative laboratory values, surgical technique, postoperative complications and pathological examination of the excised tissue and postoperative complications of the 5 patients who were included in this study were evaluated.

**Results**

Two of the patients were male and 3 were female. The mean age was 52.4 (30-61) years. None of the patients had any history of neck radiation during childhood or adolescence.

Preoperatively, calcium levels were normal in 2 patients and high in the other three. Phosphorus levels were normal in 2 patient, high in 1 patient and low in 2 patients. One patient had hyperthyroidism. The parathyroid hormone level was high in 4 patients and below normal values in one patient.

Temporary hypocalcaemia developed in 2 patients during the postoperative period. Phosphorus levels were normal, and parathyroid hormone levels were normal in 3 patients, high in 1 patient and low in 1 patient. In the follow up examinations the parathyroid hormone levels were observed to decrease in the patient with initially high levels and reached normal values in the patient with low levels. There was no nerve injury or permanent hypocalcaemia observed.

Neck ultrasonography (USG) was performed for all patients. Parathyroid scintigraphy was performed for one patient who was suspected as having a parathyroid adenoma.

All 5 patients had total thyroidectomy performed with parathyroid adenoma excision. One patient later had central lymph node dissection. Of the PTC detected patients, the tumor of one patient was larger than 1 cm and smaller than 1 cm in the others. Demographic information of the patients is demonstrated in Table 1.

**Discussion**

Primary hyperparathyroidism affects 0.5-1% of the adult population and presents with clinical findings such as kidney stones, gallstones and gastrointestinal ulcerations. The causes of PHPT are adenoma, hyperplasia and rarely carcinoma. Thyroid and parathyroid pathologies are more frequently detected in patients with multiple endocrine neoplasia than patients without multiple endocrine neoplasia. While the incidence of thyroid disease in parathyroidectomy performed patients is reported as being 2.5-17.6%, PHPT in patients with thyroid disease has been reported as being 0.3-8.7% (5). We do not have data on the frequency of cancers other than thyroid medullary carcinoma with hyperparathyroidism. Two studies have reported rates of 3.7% and 8% (5,6). Among the different reasons for the lack of data in regards to this subject, the asymptomatic course of PHPT, not all diagnosed patients are treated surgically, and the employment of minimal invasive surgical techniques for surgical treatment can be mentioned (5,6). In our study, the rate of incidental PTC in parathyroidectomy cases was found to be 4.7%. Although PHPT and PTC coexistence is more common in women, 2 of our patients were male and 3 were female.

That there is a genetic relationship between PHPT and medullary thyroid cancer is quite well defined. However, the pathogenesis between PHPT and PTC has not been explained. Goitrogenic and carcinogenic agents have been suggested to play a role in the pathology. However, there is no conclusive evidence available (7,9). It has been suggested that radiation particularly applied to the head and neck region during childhood and adolescence and hypercalcemia have oncogenic effects (10). Although Lee et al (10) reported that all 7 patients in their study did not display serious hypercalcemia, four patients had moderate hypercalcemia. Also, none of the patients had any history of radiation exposure (11). A common gene or growth factor has been suggested as being

<table>
<thead>
<tr>
<th>Gender/age</th>
<th>Calcium (mg/dl)</th>
<th>Phosphorus (mg/dl)</th>
<th>PTH (pg/ml)</th>
<th>Size(cm)</th>
<th>Radiology</th>
<th>Surgery</th>
<th>Morbidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>M/30</td>
<td>10.1</td>
<td>3.3</td>
<td>22.3</td>
<td>1.8</td>
<td>USG/scintigraphy</td>
<td>total</td>
<td>no</td>
</tr>
<tr>
<td>M/61</td>
<td>11.7</td>
<td>5.9</td>
<td>125.6</td>
<td>0.7</td>
<td>USG</td>
<td>total</td>
<td>yes</td>
</tr>
<tr>
<td>F/60</td>
<td>12.9</td>
<td>1.7</td>
<td>61.0</td>
<td>0.8</td>
<td>USG</td>
<td>total</td>
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</tr>
<tr>
<td>F/59</td>
<td>9.3</td>
<td>3.5</td>
<td>4.2</td>
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<td>USG</td>
<td>total</td>
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</tr>
<tr>
<td>F/52</td>
<td>11.9</td>
<td>4.3</td>
<td>27.9</td>
<td>0.9</td>
<td>USG</td>
<td>total</td>
<td>no</td>
</tr>
</tbody>
</table>

**Table 1:** Demographic information of the patients.

Abbreviation: PTH: Parathyroid hormone, USG: ultrasonography, preop:preoperative, postop:postoperative, M: Male, F: Female
responsible for the coexistence of PHPT and PTC, however, there is no clear evidence to prove this\(^9\)\(^{12}\). In our study, the calcium level was moderately high in 3 patients and was normal in two patients. There was no previous history of radiation application to the neck region in any of our patients. It can be said that in regards to these aspects our findings are compatible with the study of Lee et al.

Since the coexistence rate of hyperparathyroidism with thyroid disease is high, vigorous preoperative radiologic examinations are required in cases with malignancy suspicion. Particularly in male patients, where the probability of malignancy is high in cases with single nodules. For this reason, when malignancy is suspected in the preoperative period, pathologic evaluation of thyroid tissue with needle biopsy is warranted\(^{13}\).

In our study, since parathyroid surgery was planned for the patients, neck ultrasonography and parathyroid scintigraphy were performed. Although thyroid tissue nodules were observed on ultrasonography, there were no findings that suggested malignancy. For this reason, preoperative pathological examination was not performed on our patients. If we had evaluated pathologically before surgery, we would have prevented the later surgery in one patient. The most appropriate treatment in cases where parathyroid adenoma coexists with thyroid disease is the total or partial (lobectomy) excision of the thyroid gland along with the parathyroid adenoma. Also, in cases when the reason for PHPT is an adenoma, thyroid malignancies should be kept in mind requiring a careful evaluation during surgery\(^9\)\(^{14}\). Total thyroidectomy was performed in our patients because of the thyroid nodules which were detected on ultrasonography and required surgery with the parathyroid adenoma excision. Temporary hypocalcaemia developed in 2 patients due to total thyroidectomy. PTC diagnosis was made as the result of the pathologic evaluation of the thyroid tissue. In previous studies, occult thyroid cancers (<1 cm) were detected most in the excised thyroid tissues of patients with parathyroid adenomas. Also, multifocality and lymph node metastasis were rarely reported in these studies\(^{15}\). In our study, the one patient who had a tumor larger than 1 cm also had lymph node invasion. None of our patients displayed multifocality.

There is no treatment protocol in cases where PHPT and PTC coexist. The treatment methods used in patients with PTC are also valid for these patients. Following total thyroidectomy, further examination is required to detect lymph nodes with suspicious malignancy. If malignancy is detected in the lymph nodes, a second surgery of lymph node resection and neck dissection is required\(^{16}\). This situation increases the morbidity of patients. In our study, we detected lymph node invasion in postoperative examinations in one patient. Lymph node excision and central neck dissection were performed and no complications developed such as permanent hypocalcemia or nerve damage in the postoperative period.

Coexistence of PHPT and PTC is very rare. Thyroid tissue should be examined carefully in patients where surgery is planned for PHPT and pathologic evaluation with needle biopsy should be performed if possible. This will prevent subsequent surgery and complications.

References


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