



Research

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# HISTOPATHOLOGICAL RESULTS OF SUSPICIOUS NODULES IN THE PATIENTS WITH HASHIMOTO THYROIDITIS

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## Abstract

The most endocrinologists in routine practice are used to Bethesda classification for evaluation of thyroid nodule in fine needle aspiration biopsy (FNA). It is accepted that FNA biopsy is an accurate diagnostic and gold standard test. However, false-positive diagnosis may sometimes occur as a patient with a 'malign' lesion is found incorrectly rather than an actually benign lesion on histological examination. Hashimoto's thyroiditis probably is the most common cause of false-positive cytology. The aims of present study evaluate retrospectively postoperatively biopsy results in patients with Hashimoto disease have a thyroidectomy. Results of totally 29 patients with Hashimoto thyroiditis achieved from our hospital records. All of the patients had undergone totally or subtotals thyroidectomy. We are-evaluated retrospectively biopsy results postoperatively. We compared their preoperative FNA results. We detected 24.1% papillary thyroid cancer in seven patients (mean age 45.5±11.9 year), 44.8% nodular goitre in 13 patients (mean age 45.8±4.9 year), 13.7% adenomatous nodule in four patients (mean age 43.5±14.4 year), 3.4% hurtle cell adenoma in one patient with 56 years old. But, 14% in four patients with Hashimoto thyroiditis (mean age 41.5±13.1 year) were redundantly operated due to atypia of undetermined significance in FNA. Although Hashimoto disease is a benign diagnosis, its misclassification as atypia of undetermined significance in FNA accounts for some false-positive errors. The cytopathologists can frequently be interpreted as atypia of undetermined significance instead of Hashimoto's thyroiditis. Therefore, result of atypia of undetermined significance in FNA may lead unnecessarily concern among with the endocrinologists. More importantly, our results demonstrated that high papillary thyroid cancer rate was found postoperatively in suspicious nodules evolved background Hashimoto thyroiditis.

**Keywords:** Hashimoto thyroiditis, Nodules, Fine needle aspiration biopsy, Papillary thyroid cancer

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## 1. Introduction

In routine practice, the fine needle aspiration biopsy (FNAB) is used for the Bethesda classification for the evaluation of the thyroid nodule. Fine needle aspiration biopsy is considered to be a correct diagnostic and gold standard test.(Chehade, Lim et al. 2010) However, a false positive diagnosis may sometimes occur because histological examination is wrong in a patient with a faulty lesion, rather than a really benign lesion.(Chen, Pace et al. 2012) One of the most common causes of false positive cytology is Hashimoto thyroiditis. The aim of this study was to retrospectively evaluate postoperative biopsy results in patients with Hashimoto's disease who underwent thyroidectomy.

## 2. Material and Method

This retrospective study was approved by the ethics committee of our institution, and written informed consent was obtained. The results of 29 patients with Hashimoto thyroiditis were obtained from our hospital records. 32,5 % of the cases were male and 67.5% were female. All patients underwent complete or subtotal thyroidectomy. Postoperative retrospective biopsy results were evaluated. Preoperative FNA results were compared. Cytology results were divided into seven categories according to the Bethesda system applied in the pathology department of our hospital: 1. Benign (benign follicular

nodule, chronic lymphocytic thyroiditis, regressive changes, dominant nodule on the base of thyroiditis, colloid, hurtle cell adenomatoid nodule, cellular adenomatoid nodule, hyperplastic showing regressive changes. nodule), 2. Malignant, 3. Malignancy suspicion, 4. Inadequate material, 5. Unspecified atypia, 6. Follicular neoplasia or suspicion, 7. Hurtle cell neoplasia or suspicion.

The analyzes were performed with IBM SPSS 20 statistical analysis program. For the 95% confidence interval, 2-way p-values were used for all tests and the significance level of p-value was considered to be smaller than 5% (p <0.05). Student's t test, Mann Whitney U test, Chi-square, Fisher Exact, Pearson and Spearman correlation tests were used in the analyzes. Data were presented as mean, standard deviation, percentage.

## 3. Results

Seven patients (mean age 45.5 ± 11.9 years) had 24.1% papillary thyroid cancer, 13 patients (45.8 ± 4.9 years), 44.8% nodular goiter, and 13.7% adenomatous nodules in four patients (mean age 43.5 ± 14.4 years). 3.4% patients with hurtle cell adenoma were detected adenoma in one patient with 56 years old. (tablo1). However, four patients with Hashimoto's thyroiditis (mean age 41.5 ± 13.1 years) had undergone unnecessary surgery in 14% of the patients, because they had atypical atypia in FNAB.

**Table 1.** Results of the fine needle aspiration biopsy (FNAB) results

FNAB results	Patients	%
Papillary thyroid cancer	7	24.1%
Nodular goiter	13	44.8%
Adenomatous nodules	4	13.7%
Hurtle cell adenoma	1	3.4%
Total	25	86 %

## 4. Discussion

The most common autoimmune thyroid disease is Hashimoto's thyroiditis (HT). Hashimoto's thyroiditis is the most common cause of hypothyroidism in areas with iodine deficiency (Uhliarova and Hajtman 2018). Hashimoto's disease was first described by Japanese

surgeon and pathologist Hakaru Hashimoto in 1912 (Mazokopakis, Tzortzinis et al. 2010). Genetic susceptibility and environmental factors play a role in the pathogenesis of autoimmunity (FISHER 2008). Hashimoto pathology; diffuse lymphocyte infiltration, fibrosis and parenchymal atrophy are seen. Thyroid dysfunction over time leads to the development of goiter

(Cipolla, Sandonato et al. 2005). High antithyroid peroxidase and antithyroglobulin antibody titres are found in 90% of the cases. The

Sonographic findings of diffuse HT are hypoechoic micronodules with echogenicity, hypervascularity, heterogeneity and echogenic rims (Anderson, Middleton et al. 2010).

The diagnosis of Hashimoto is a histological diagnosis. But the clinical evaluation and the increase in antibody in the serum make the diagnosis. The disease occurs in 1000 individuals worldwide in 3:1.5 and is more common in women than in men (Davies and Welch 2006).

The most common malignancy in the endocrine system is thyroid cancer and accounts for about 1% of all cancers. The most common thyroid cancer is papillary thyroid cancer with a rate of 70-80%. Thyroid peroxidase antibodies were 13.0% and twice as common in women as in men (Hollowell, Staehling et al. 2002).

Several studies have demonstrated the association of Hashimoto thyroiditis and thyroid carcinoma (Cohen, Rose et al. 1974, BAGNASCO, VENUTI et al. 1989, Gharib, Goellner et al. 1993, Ersoy, Gul et al. 2007, Ekambaram, Kumar et al. 2010, Yoon, Kim et al. 2012). In our study, we found PTK in 7 (24.1%) patients. The relationship between HT and Papillary Thyroid Carcinoma (PTK) was first reported in 1955 by Dailey et al. (DAILEY, LINDSAY et al. 1955). The frequency of this association was reported between 0.3% and 58% (Ekambaram, Kumar et al. 2010). In addition to studies showing an increased risk of thyroid cancer in patients with Hashimoto thyroiditis (Gul, Dirikoc et al. 2010, Cunha, Ferreira et al. 2011) studies showing that there is no increase are also available (Erdogan, Erdem et al. 2009, Anil, Goksel et al. 2010).

In a meta-analysis performed by Singh et al., The frequency of thyroid cancer was 2.48 times higher in HT patients compared to the control group and the incidence of HT in patients with PTC was 2.77 fold higher. It is still not known whether Hashimoto's thyroiditis and thyroid carcinoma trigger each other (Ersoy, Gul et al. 2007). Various opinions were expressed in the studies related to this. Debates continue to determine whether HT pre-determined patients for PTC development.

US imaging of Hashimoto's thyroiditis may vary. Sometimes the gland appears atrophic, sometimes the thyroid gland may be diffuse. The frequency of nodules in patients with Hashimoto thyroiditis has been reported in the literature with rates varying between 14% and 42%. (Erdogan, Erdem et al. 2009, Mukasa, Noh et al. 2011).

Fine needle aspiration cytology is the first step method to study thyroid nodules (Poropatich, Marcus et al. 1994). Cytopathologic and histopathological evaluation for the diagnosis of HT is the gold standard/ Histopathological features of HT include destruction of follicles, Hurthle cell metaplasia, colloid and lymphocytic infiltration, and epithelial cell deposits, fibrosis. There are several difficulties in the use of FNAB in the diagnosis of HT. HT can be skipped in cytological specimens showing

hyperplasia and colloid presence (Ekambaram, Kumar et al. 2010). The sensitivity of FNAB was found to be low in nodules with a radius of 3 cm and greater. (Anil, Goksel et al. 2010).

In patients with HT, the presence of nuclear expansion, aggregation, intranuclear inclusion and atypical findings (fibrosis, lymphocytic infiltration, hurthle cell metaplasia) in the cytopathological evaluation may lead to confusion with TPC and cause misdiagnosis (Bildik, Altıntaş et al. 2009, Haberal, Toru et al. 2009). Case reports of apparent Hurthle cell changes in Hashimoto's thyroiditis may lead to misinterpretation of cytology (Gayathri, Kalyani et al. 2011). False positive results can cause unnecessary surgery. Accordingly, the use of FNAB alone may lead to a decrease in malignancy rates due to the difficulty of cytopathological evaluation in patients diagnosed with HT serologically.

Although Hashimoto's disease is a benign diagnosis, misclassification as an unspecified atypia in FNAB may cause some false positive errors. Cytopathologists often interpret Hashimoto's thyroiditis as an unspecified atypia. Therefore, the imprecise atypia result in FNAB may cause unnecessary anxiety among endocrinologists. More importantly, our results showed that in the postoperative examination of suspected nodules with high risk papillary thyroid cancer, the presence of Hashimoto thyroiditis was found in the background.

When unspecified atypia in FNAB is detected, if there is a Hashimoto's thyroiditis in the background, it should be evaluated carefully.

### Conflict of interest

The authors declare that there is no conflict of interest.

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