



## Incidence of Thyroid Carcinoma in Patients Undergoing Thyroidectomy for Nodular Goiter in Bitlis Province

### Bitlis İlinde Nodüler Guatr Nedeniyle Tiroidektomi Uygulanan Hastalarda Tiroid Kanseri İnsidansı

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#### Abstract

**Objective:** The most frequently observed endocrine cancer is thyroid malignity. It constitutes only one percent of all malignities. The aim of this study is to investigate the incidence of thyroid cancer in cases with nodular goiter who underwent thyroidectomy performed by a single surgeon in Bitlis province (Turkey), an endemic goiter region.

**Materials and Methods:** Pathology reports with surgery indication of 940 patients, who underwent thyroidectomy administered by the same surgeon for nodular goiter at Bitlis State Hospital between September 2008 and March 2015, were studied retrospectively. Postoperative histopathologic examinations were evaluated.

**Results:** Female and male counts of our 940 patients were 827 (88%) and 113 (12%), respectively. The proportion of female to male patients was 7,3/1. 30 of 940 patients (3,2%) underwent one part total and the other part near total thyroidectomy and 910 patients (96,8%) underwent total thyroidectomy. Histopathological examination showed that 825 (87,7%) cases had nodular hyperplasia, 46 (4,9%) cases had lymphocytic thyroiditis, and 69 (7,3%) cases had thyroid tumors. 69 tumors in 18 (26%) cases were benign; 51 (74%) cases were malign. In terms of cancer type, 45 (4,7%) cases had papillary carcinoma, 5 (0,5%) cases had follicular carcinoma, and 1 (0,1%) case had medullary carcinoma.

**Conclusion:** In some cases in endemic goiter regions, received exogenous iodine can affect cytological results and cause changes in thyroid tissue morphology. The observed incidence of thyroid cancer was 5,4% in the cases who underwent thyroidectomy due to nodular goiter in Bitlis province; and papillary thyroid carcinoma was the most observed cancer type.

**Keywords:** Endemic Nodular Goiter; Thyroidectomy; Thyroid Carcinoma.

#### Öz

**Amaç:** Tiroid maligniteleri en sık görülen endokrin kanserlerdir. Tüm malignitelerin %1'ini oluştururlar. Bu çalışmanın amacı, endemik guatr bölgesi olan Bitlis ilinde tek cerrah tarafından tiroidektomi yapılan nodüler guatr olgularında, tiroid kanseri görülme sıklığını araştırmaktır.

**Gereç ve Yöntem:** Bitlis Devlet Hastanesinde, Eylül 2008 ve Mart 2015 tarihleri arasında nodüler guatr ön tanısıyla cerrahi endikasyonu konulan ve tek cerrah tarafından tiroidektomi yapılan toplam 940 hastanın patoloji raporları retrospektif olarak tarandı. Postoperatif histopatolojik bulgular değerlendirildi.

**Bulgular:** Hastalarımızın 827'si (%88) kadın, 113'ü (%12) erkek olup, kadın/erkek oranı 7,3/1 idi. Toplam 940 hastanın 30'una (%3,2) bir taraf total + diğer taraf totale yakın, 910'nuna (%96,8) bilateral total tiroidektomi uygulandı. Histopatolojik incelemede 825 (%87,7) olguda nodüler hiperplazi, 46 (%4,9) olguda lenfositik tiroidit, 69 (%7,3) olguda ise tiroid tümörü tespit edildi. 69 tümör olgusunun 18'i (%26) benign, 51'i (%74) ise malign idi. Kanser tipi olarak 45 (%4,7) olguda papiller karsinom, 5 (%0,5) olguda folliküler karsinom, 1 (%0,1) olguda ise medüller karsinom tespit edildi.

**Sonuç:** Endemik guatr bölgelerinde, ekzojen iyot alınması bazı olgularda tiroid dokusu morfolojisinde değişime neden olarak sitolojik sonuçları etkileyebilmektedir. Bitlis ilinde tiroidektomi yapılan nodüler guatr olgularında tiroid kanseri görülme sıklığı %5,4 olarak tespit edilmiş olup, en fazla kanser tipi olarak papiller tiroid karsinomu görülmektedir.

**Anahtar Kelimeler:** Endemik Nodüler Guatr; Tiroidektomi; Tiroid Kanseri.

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## INTRODUCTION

As is the case all over the world, there are endemic goitre pictures as a result of iodine deficiency in some areas in Turkey. The pathogenesis of goiter in areas with iodine deficiency can show different characteristics in terms of both functional and organic ways. In these areas, exogenous iodine supplementation can cause changes in the morphology of thyroid tissues and, therefore, affect cytologic results (1). Studying endemic goiter pathogenesis initially reveals development of homogeneous hypertrophy (goitre) due to the growth of thyroid mass (2). In this study, we aim to investigate the incidence and type of thyroid cancer in nodular goitre patients operated by the same surgeon in Bitlis, one of the endemic regions in Turkey.

## MATERIALS and METHODS

In this study, we evaluated a total of 940 patients who underwent thyroidectomy with nodular (solitary or multiple) goitre diagnosis at Bitlis State Hospital between September 2008 and March 2015. Cases with goitre recurrence, patients with malignant fine-needle aspiration biopsy, and patients requiring neck dissection in the same session were excluded from the study. The data of patients were retrospectively obtained and reviewed from patient epicrises, operation room records, notes taken by specialist physicians about patients, and hospital pathology archives. All patients were operated by the same surgeon in the same centre. The majority of patients were patients with increased thyroid nodules (in size and number) from Bitlis and surrounding countryside. There were even patients with plunging giant goitre and signs of pressure.

## RESULTS

Of the 940 patients who underwent thyroidectomy, 827 (88%) were females and 113 (12%) were males with a

**Table 2.** Sex distribution and age of malign cases.

Diagnosis	- -	Female (n)	Percentage (%)	Male (n)	Percentage (%)	Youngest	Oldest
Papillary carcinoma	38	38	74,5	7	13,7	16	65
Follicular carcinoma	3	3	5,9	2	3,9	40	69
Medullary carcinoma	1	1	2	0	-	-	-

## DISCUSSIONS

In countries like Turkey, where thyroid pathologies are commonplace, the use of thyroidectomy is continuing to increase day by day. Several geographic regions have been noted for endemic iodine deficiency. These places are usually mountainous regions and the soil is poor in iodine (3). Bitlis and its surroundings is a mountainous place and is known to host iodine deficiency. In sufficient nutrition combined with iodine deficiency, genetic predisposition, environmental factors and personal

female/male ratio of 7,3/1. The average age of the patients was 38,1 (14-77). Of the 940 patients, 30 of them (3,2%) underwent total + near total thyroidectomy while 910 (96.8%) patients underwent bilateral total thyroidectomy. Histopathological examination showed that 825 (87.7%) cases were diagnosed with nodular hyperplasia while 46 (4.9%) had lymphocytic thyroiditis and 69 (7.3%) received thyroid tumour diagnosis. In terms of cancer type, 45 (4.7%) patients had papillary carcinoma, 5 (0.5%) patients had follicular carcinoma, and 1 (0.1%) showed medullary carcinoma (Table 1).

**Table 1.** Number and percentages of patients according to Histopathological diagnosis.

Diagnosis	Number (n) (%)	Percentage
<b>Nodular hyperplasia</b>	825	87,8
<b>Lymphocytic thyroiditis</b>	46	4,9
<b>Benign tumour</b>		1,9
Follicular adenoma	18	
<b>Malign tumour</b>		
Papillary carcinoma	45	4,8
Follicular carcinoma	5	0,5
Medullary carcinoma	0,1	1
Total	940	100

Anaplastic carcinoma was not detected. 38 (84.4%) patients diagnosed with papillary carcinoma were females and 7 of these patients were (15.6%) were males. The youngest patient was 16; the oldest patient was 65 years old and the average age was 39.4. 3 (60%) patients diagnosed with follicular carcinoma were females and 2 (40%) of these patients were males. The youngest patient was 40; the oldest patient was 69 years old and the average age was 47.4. The only one case with medullary carcinoma was a 40-year-old woman. Among the patients undergoing thyroidectomy, a total of 51 (5.4%) - 42 (4.5%) females and 9 (0.9%) males - showed malignancies (Table 2).

characteristics are effective in the formation of goitre. Especially iodine deficiency is the most important factor in goitre formation in Turkey. For a long time, it has been aimed to eliminate iodine deficiency with food and

exogenous iodine supplementation in order to prevent goiter development. While exogenous iodine supplementation from birth reduces goitre prevalence in new generations, this supplementation may cause some changes in the spectrum and pathogenesis of the disease in individuals who previously had goiter and

nodular development (4). Nodular goitre is more common in women and it occurs in 4-5% of the society. There are different opinions on this matter and its underlying reasons. It has been suggested that women are more prone to develop thyroid nodules because they have positive antithyroperoxidase antibody titres (TPOAb) and low iodine excretion (<50 microgram/day) (5). In our study, 88% of the patients who underwent thyroidectomy were females while only 12% of these patients were males.

Thyroid cancer is less common compared to other types of cancer in society and the course of the disease is quite good. With correct diagnosis and treatment, the disease can be eliminated completely and the patient can live for a long time. Having received longitudinal radiation on the neck, vocal hoarseness, vocal cord paralysis, and having thyroid cancer history in the family bring high probability of cancer of thyroid nodules detected (6). Rapidly growing thyroid nodules that do not respond to drug therapy (TSH suppression), nodules detected before 20 years of age or and those detected after 60 along with solitary, hard, cold, and fixed nodules with accompanying lymphadenopathy carry the possibility of cancer. Besides, thyroid nodules observed in men have higher cancer incidence than those detected in women. Thyroid cancer constitutes approximately 1% of all cancers. Thyroid cancers can be divided into subgroups as follows: differentiated (papillary and follicular), undifferentiated (medullary, anaplastic), and other (lymphoma, sarcoma, metastasis from other organs, etc.). 75% of these cancers are differentiated cancer types. Among these cancers, papillary cancer is the most common type with 80% (7).

In line with the epidemiology of thyroid nodules, thyroid cancer is more common in women. According to the literature, 74% of the newly identified patients are females (8). In our study, too, 42 (82.3%) of the newly diagnosed 51 malignant cases were females while there were 9 (17.7%) such male patients; the female/male ratio was 4.6/1. Although these rates are consistent with the literature, Belfiore et al. (9) have stated that <30-year-old and >60-year-old males have a higher risk of cancer.

One notable detail in endemic goitre regions is the change in malignant solid nodules. Experimental studies on animals have shown that prolonged iodine deficiency leads to a significant increase in thyroid epithelial cell cancers (10). Again, it is reported that incidence for follicular, poorly differentiated, and anaplastic cancer types are higher in regions where endemic goiter and iodine deficiency are common (11). In a study conducted in Düzce (Turkey) on 198 patients with nodular goitre, it has been observed that 1.5% of these patients had thyroid cancer after the operation; 2 of these patients had papillary carcinoma while 1 patient had poorly differentiated thyroid carcinoma (4). Lawal et al. (12)'s study on patients who underwent thyroidectomy due to nodular goitre reports a cancer incidence rate of 13%; 69% of these patients are reported to have follicular carcinoma diagnosis.

Several studies in the literature demonstrate that iodine prophylaxis helps prevent diseases related with iodine deficiency while it causes changes in the histologic subtypes of thyroid cancer as well as in its phases (13). As external iodine intake increases papillary thyroid carcinomas in well-differentiated tumours, it reduces follicular and anaplastic carcinomas. Slowinska-Klencka et al. (1) have similarly reported a decrease in follicular carcinoma rates with exogenous iodine intake in endemic regions while the intake has caused increase in papillary carcinoma rates. The reason why papillary thyroid carcinoma was more common in our study could be a result of the increase in the use of iodised salt as with the rising awareness.

The most common cause of re-operation in thyroid surgery is the presence of incidental malignancy in pathology results. Castro et al. (7) have reported that 5% of all thyroid nodules are malignant. Bozkurt and Bektas's (14) study on 241 patients operated due to nodular goitre reports a cancer rate of 4.6% while Üçer's (15) study on 1275 patients with nodular goitre reports this rate to be 7.8%. Similarly, Senyürek et al.'s (16) have observed a cancer rate of 6.5% in patients with thyroid nodules while Erbil et al. (17) reports that they observed a post-thyroidectomy thyroid cancer rate of 11% in patients with nodular goitre. In our study, we observed malignancy in 51 patients (5.4%) with a cancer rate compatible with those in the literature; of these cancer types, the most common type was papillary carcinoma (88.2%).

Surgery performed for nodular goitre should both treat patients and cause minimal postoperative complications. In recent years, thyroidectomy is widely applied due to the increasing number of cases with recurrence and complications following surgeries performed to treat recurrence. One of the most important advantages of total thyroidectomy is that there is no remaining normal thyroid tissue after the operation. This allows practitioners to determine and treat local and/or distant metastases by using post-operative radioactive iodine treatment if needed (18).

## CONCLUSION

There are no previous studies investigating the incidence of thyroid cancer and types of cancer in Bitlis province. As it has been indicated in this study, the thyroid cancer incidence in patients undergoing thyroidectomy by the same surgeon, in the same medical centre in Bitlis province with a pre-diagnosis of nodular goitre was 5.4% while the most common type of cancer was, in line with the literature, papillary carcinoma.

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