

# Clinical Presentation of Thyroid Nodules in Patients Submitted to Surgery

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**Background:** Thyroid nodules can be discovered in the most varied circumstances. There are very few published data demonstrating the way in which thyroid nodules come to medical attention. This study aims to evaluate the clinical presentation of thyroid nodular disease, and to assess whether the presence of malignancy influences the presentation.

**Methods:** This paper is a prospective analysis of 164 patients diagnosed with thyroid nodular disease who underwent thyroid surgery in the two Departments of Surgery of the Tîrgu Mureş Emergency County Hospital. Face-to-face interviews were conducted to obtain data on how these patients with thyroid nodules come to medical attention. The patients were classified in the following categories: no symptoms and no signs; only symptoms, no signs; no symptoms, only signs (cervical tumor); symptoms and signs. The final pathological diagnoses of the thyroid resected specimens were obtained from database registries of the Department of Pathology.

**Results:** Most of the patients (64.01%) with thyroid nodular disease require a medical advice when they have cervical symptomatology, in the presence or not of a clinically apparent cervical tumor. 23.18% were patients in which the thyroid nodules were found incidentally by imaging tests performed for other purposes. The higher proportion of malignancy was recorded in patients with thyroid evident growth 52.38%.

**Conclusion:** The presence of a cervical tumor represents a clear invitation to a medical examination. The incidental discovery of thyroid nodules should not be overlooked. The cervical symptoms might have anything to do with the presence or with the size of thyroid nodules.

**Keywords:** thyroid nodules, symptoms, signs, malignancy

## Introduction

Thyroid nodular disease is a common condition in the adult population. Clinically apparent nodules have been estimated to occur in 4–7% of the adult population, predominantly in women. Using ultrasound studies the prevalence of incidentally discovered thyroid nodules in healthy adults has been reported to vary between 20% and 76%, depending on the sensitivity of the machine used [1].

Most patients with thyroid nodules have few or no symptoms, and usually no clear relationship exists between nodule's histological features and reported symptoms. A choking sensation, cervical tenderness or pain, dysphagia or hoarseness may be perceived as attributable to thyroid disease, but in most patients, these symptoms are caused by nonthyroid disorders.

This study aims to evaluate the clinical presentation of patients with thyroid nodular disease, and to assess whether the presence of malignancy influences the presentation.

## Methods

This study is a prospective analysis of the patients diagnosed with nodular thyroid disease (solitary or multiple nodules), who underwent a total or partial thyroidectomy in the Department of Surgery I and II of Tîrgu Mureş Emergency County Hospital between September 2009 and October 2010.

Data were collected, with the patients consent, during a face-to-face interview using a structured questionnaire focused on the way in which patients with thyroid nodules come to medical attention. This questionnaire elicited information on the signs and symptoms that have guided

the patient to the endocrinologist: appearance of a cervical tumor, dysphagia, dysphonia, cervical pain, dispnea, dry irritating cough. Socio-demographic characteristics (age, gender, level of education, environment provenance) were also recorded. In order to determine the size of the thyroid nodules, all the patients were examined by thyroid ultrasonography before the surgery. Based on the collected data from questionnaires, 4 clinical categories were established:

- ▶ 0/0 category: no symptoms and no signs. This category includes patients with no symptoms that could be related to the presence of thyroid nodules and no cervical tumor. These patients were referred to the endocrinologist from other departments, like gynecology, cardiology etc, to investigate different thyroid or non-thyroid diseases: menstrual disorders, gynecomastia, to exclude the Basedow-Graves disease before an ophthalmologic surgery, to exclude a hyperthyroidism in patients with heart rhythm disorders, etc. Other thyroid nodules have been incidentally discovered during imaging tests in order to diagnose other illnesses: carotid Doppler ultrasonography, chest x-ray or thoracic computer tomography.
- ▶ 1/0 category: only symptoms, no signs. This category includes patients with one or more symptoms that could be attributed to the compressive phenomena of the thyroid nodules: dysphonia, dysphagia to solids or liquids, cervical pain, dispnea, choking sensation or dry irritating cough. These patients have no clinically apparent cervical lump.
- ▶ 0/1 category: no symptoms, only signs (cervical tumor). In this category we included patients without

**Table I. Description of the 4 categories**

Category	0/0	0/1	1/0	1/1
No. of cases/ proportion	38/23.18%	21/12.81%	54/32.92%	51/31.09%
Mean age (years)	52.65±14.51	46±13.22	49.79±11.24	50.27±13.31
Men/Women ratio	1/6.6	1/6	1/9.8	1/11.7
Environment				
Urban	26 (68.4%)	14 (66.7%)	37 (68.5%)	23 (45%)
Rural	12 (31.6%)	7 (33.3%)	17 (31.5%)	28 (55%)
Level of education				
Elementary school	10 (26.3%)	7 (33.3%)	8 (14.8%)	12 (23.5%)
Secondary school	15 (39.4%)	12 (57.2%)	33 (61.1%)	33 (64.7%)
College or university	13 (34.3%)	2 (9.5%)	13 (24.1%)	6 (11.8%)

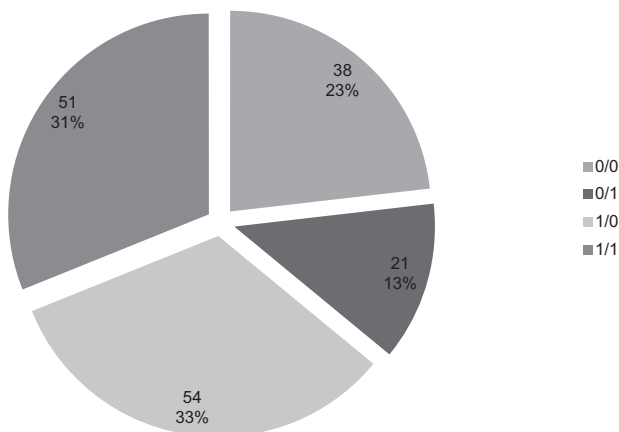
compressive neck symptoms, but who present a cervical tumor. This tumor was observed by the patient himself, by the family or friends, or by the physician during a clinical general examination.

- ▶ 1/1 category: symptoms and signs. The patients from this category have one or more compressive cervical symptoms and present also a cervical tumor.

The final pathological diagnoses of the thyroid resected specimens were obtained from database registries of the Department of Pathology, Tîrgu Mureş Emergency County Hospital. We classified these diagnoses in two histological categories:

- ▶ benign nodules (dystrophic lesions – diffuse goiter, nodular goiter, thyroid nodules and cysts, Basedow Graves disease; inflammatory lesions – lymphocytic thyroiditis, granulomatous thyroiditis; benign tumors – thyroid adenoma and his variants);
- ▶ malignant nodules (papillary carcinoma, follicular carcinoma, poorly differentiated carcinoma, undifferentiated carcinoma, medullary carcinoma, lymphomas, metastatic tumors).

All statistic analyses were performed using Epi-Info 2010 and Microsoft Excel 2007 programs. The statistical evaluation included the ANOVA analysis and Z test, with a level of significance  $p < 0.05$  and confidence intervals at 95%.



**Fig. 1. Number of cases in the four categories of the study**

**Table II. The rate of malignancy by gender in the 4 categories**

Category	Proportion of malignant thyroid nodules by gender		p value
	Women	Men	
0/0	40% (13/33)	80% (4/5)	0.98
0/1	47% (8/17)	75% (3/4)	0.99
1/0	38.7% (19/49)	0% (0/5)	–
1/1	29.8% (14/47)	25% (1/4)	0.83

**Results**

The study included a total of 164 patients (147 women and 17 men) diagnosed with thyroid nodular disease, who underwent a total or partial thyroidectomy. The mean age at the surgery moment was similar for men and women: around 50 years old.

The patients’ distribution in the four clinical categories is illustrated in Table I. The most cases are included in 1/1 and 1/0 categories 31.09% and 32.92% respectively.

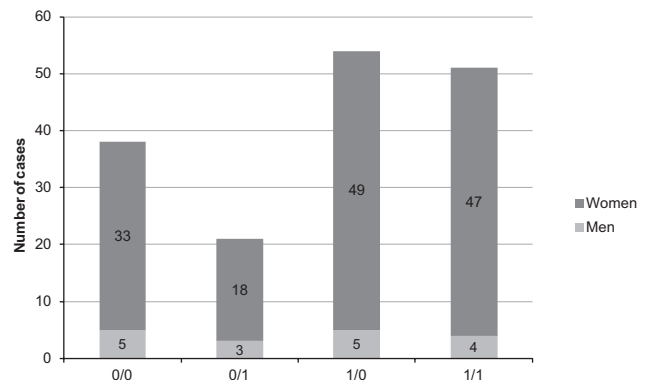
In all the categories the majority of the patients were women, men/ women ratio ranging between 1/6 (0/1 category) and 1/11.7 (1/1 category), Table I.

The lowest mean age at the surgery time was observed in the 0/1 category (46±13.22 years old) and the highest mean age in the 0/0 category (52±14.51 years old) (Table I). We didn’t observe a significant statistical difference between the patients’ age in the four categories,  $p = 0.309$ .

Analyzing the provenance of the patients we found that most patients came from urban areas. Rural/urban subunitary ratio has been relatively constant in the 0/0, 0/1 and 1/0 categories and in 1/1 category we noticed a slight increase of rural patients proportion (55%), Table I.

When we evaluated the level of education of the patients of each category, we found that in the 0/1, 1/0, 1/1 categories the majority of the patients had a medium level of education (57.2%, 61.1%, 64.7%). In the 0/0 category we noticed a more balanced ratio between patients with primary education, medium and higher level of education (26.3%, 39.4% and 34.3%) Table I.

From the thyroid ultrasound report of each patient we recorded the greatest diameter of the thyroid nodule. In the cases of multinodular disease we registered the maxi-



**Fig. 2. Women/men ratio for the four categories of study**

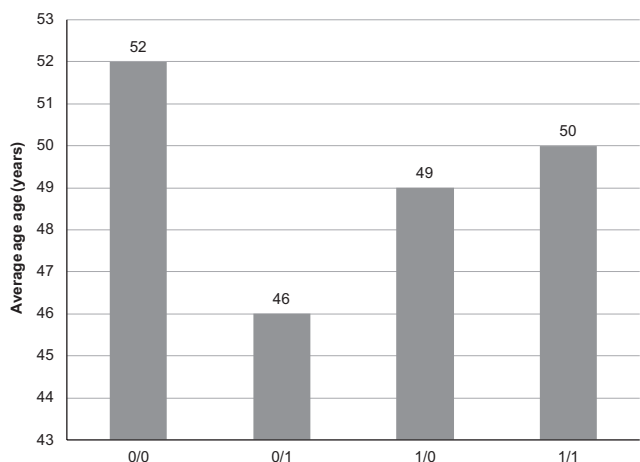


Fig. 3. The average age at the thyroid surgery time in the 4 categories (years)

imum size of the largest node. The average of the greatest node diameters for every of the four studied categories is shown in Figure 1.

There were no significant differences when we compared the average size of patients' thyroid nodules from 0/1 (26.78 mm), 0/0 (28.11 mm), and 1/1 (28.78 mm) categories,  $p > 0.05$ , but comparing the mean size of thyroid nodules of patients from 1/0 (20.1 mm) category to those from 0/0 and 1/1 categories we had a significant difference  $p < 0.01$ .

The smallest average was noticed in the 1/0 category (20.1 mm). The mean size of the nodules detected by patients was 23.87 mm, by medical practitioners 33.5 mm, and 30.5 mm for the nodules observed by family, friends, acquaintances.

Analyzing the frequency of the various symptoms of the patients from 1/0 and 1/1 categories, we observed a relatively similar distribution, the most common being the choking sensation (75.9%, 78.4%), as is shown in Figure 2.

We have also studied the malignancy rate for each category, as is illustrated in Figure 3. The higher rate of thyroid malignant tumors was registered in 0/1 category 52.38%. When we studied the distribution of malignant tumors by gender, we observed that the higher rate of malignancy had men from 0/0 (80%), and 0/1 (75%) categories, even

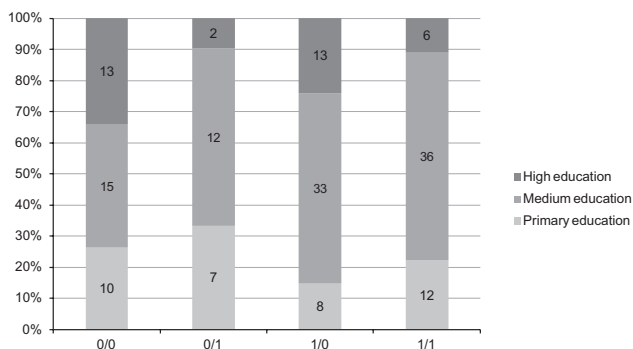


Fig. 5. The education level of the patients from the 4 categories

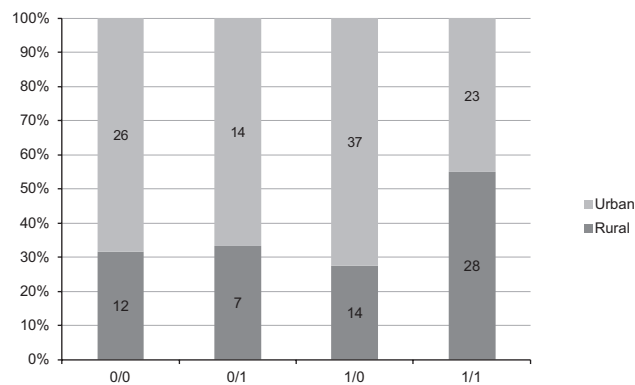


Fig. 4. Environment provenance of the patients from the studied categories

if statistical significance was not demonstrated,  $p > 0.05$ , Table II.

### Discussion

Thyroid nodular disease is a common finding in endocrine clinical practice. There are no many published data demonstrating the way in which the thyroid nodules come to medical attention. The purpose of our study was to analyze the circumstances for which patients with thyroid nodules reach the endocrinologist.

Our study shows that most of patients (64.02%) with thyroid nodular disease require a medical advice when they have cervical symptomatology like: dysphonia, dysphagia, cervical pain, dispnea, choking sensation or dry irritating cough, that they associate it with a thyroid disorder, in the presence or not of a clinically apparent cervical tumor (1/1 and 1/0 categories). 23.18% were patients without history of thyroid disease in which the thyroid nodules were incidentally found by imaging tests performed for other purposes. Mevawalla's study of solitary thyroid nodules in surgical patients finds that 30% of the nodules were incidentally discovered [2]. Literature data show that thyroid incidentalomas have been documented in 16% of cross-sectional neck scans (CT, magnetic resonance imag-

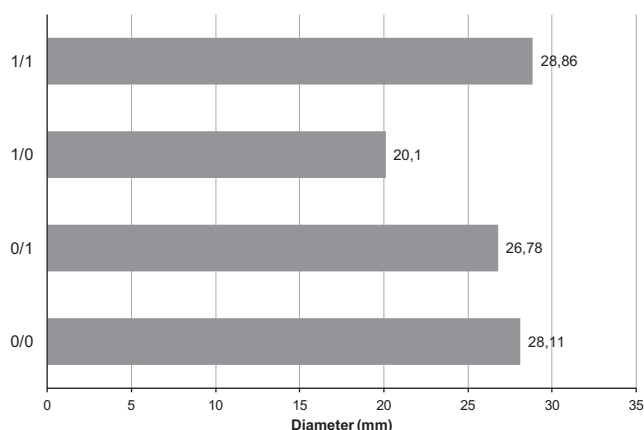


Fig. 6. The average of the greatest diameter of the thyroid nodules for the four categories (mm)

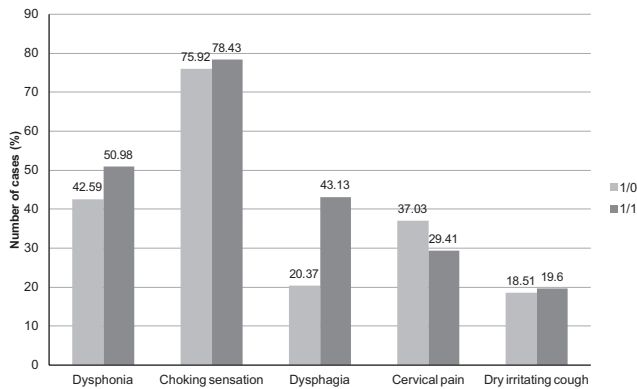


Fig. 7. The proportion of the symptoms for the patients from 1/0 and 1/1 categories

ing), 9.4% of carotid duplex scans, and 2% to 3% of PET scans [3,4]. Lately incidental thyroid nodules are being found with increasing frequency as a result of the widespread availability and advancement in radiographic imaging technology.

Most of the patients included in this study live in urban area and have a medium level of education, so they have a better accessibility to medical services, advanced medical equipments and information. The patients from rural areas addressed to the physician in higher proportion only when they are experiencing symptoms accompanied by the tumor growth (1/1 category).

When we analyzed the size of the nodules, we observed that the patients who accused only cervical symptoms had significantly smaller nodules (20.10 mm) compared to those from 0/0 (28.11 mm) and 1/1 (28.86 mm) categories. So, we believe that symptoms like dysphonia, dysphagia, cervical pain, dispnoea, choking sensation or dry irritating cough, most often are not caused by the presence or the size of thyroid nodules. It could be possible that these symptoms, particularly the choking sensation, more frequent on women correspond to an anxious syndrome and not to thyroid nodules.

Usually the incidentalomas have small sizes of around 10–15 mm, but there are studies that noted a medium size of 20 mm [3,5,6,7]. We calculated the mean size of the largest diameters and obtained a higher average (28.11 mm). The explanation of a quite large asymptomatic thyroid nodule, that is unnoticed could be its posterior position or the thick neck conformation.

The higher proportion of thyroid nodules malignancy was recorded in patients with evident thyroid growth (52.38%), especially in men, which underscores the importance of investigating any cervical nodular formations. Patients complaining of neck symptoms associated or not to a thyroid growth have a risk of malignancy of about 30%. But, the most amazing result concerned patients with no signs and symptoms of their thyroid nodule, in which the rate of malignancy was 44%. Data from literature established an incidentalomas malignancy overall rate of 4–12% [8,9,10]. 33–35% from the incidentalomas

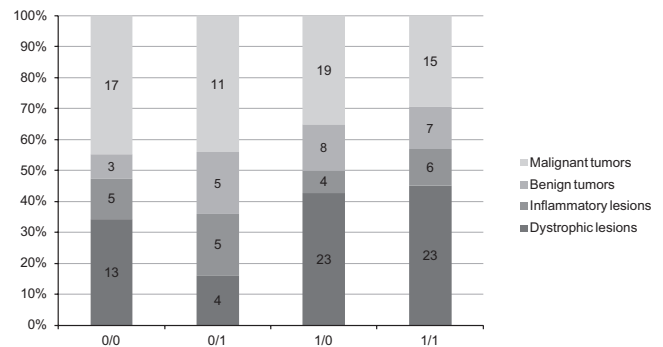


Fig. 8. Histopathological diagnosis in the studied categories

discovered on PET [3,4,5,11] and 11% [3,7] from those diagnosed on CT, are malignant. The absence of symptoms does not rule out malignancy, three quarters of thyroid cancers are asymptomatic [12].

It is important to mention that our study has several limitations. Our results are limited to a reduced and selected population in which the thyroid surgery was already suggested. This fact might explain the high rate of malignancy, and this is why we think that it cannot be applied to the general population. Moreover, some small malignant foci are out of the studied nodule in the resected specimen, this association being an unfortunate coincidence.

We studied solitary nodules and also multinodular goiters, but ultrasound measurements were done only for the largest nodules, so it could be possible that multiple nodules to cause symptoms in some cases.

## Conclusion

The presence of a cervical tumor is an obvious invitation to a medical examination, especially in men. The incidental discovery of the thyroid nodules should not be overlooked, as an important percentage of these nodules showed to be malignant. In most of the cases, the cervical symptoms cannot be related to the presence or the size of thyroid nodules. A further study to evaluate whether the thyroid surgery have resolved the patients symptoms it would be interesting.

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