

Comparison of Palpation and Ultrasonography in the Diagnosis of Thyroid Nodules

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Thyroid nodules are a very common problem in clinical practice. The most widely used method for the diagnosis of thyroid nodules is palpation. However, it is not possible to diagnose thyroid nodules using palpation in the majority of cases. But ultrasonography is more sensitive in detecting thyroid nodules. In this study, we aimed to compare the diagnosis of patients obtained with physical examination or ultrasonography in order to evaluate the change in diagnosis of patients after ultrasonography. 907 patients (745 females, 162 males; age: 40.9 ± 11.7 years) were included in the study. Physical examination (palpation) findings and ultrasonography results of patients were analyzed and compared. Of the 261 patients evaluated as having diffuse goiter with palpation, 237 (90.8%) patients had nodules in ultrasonography. In addition, of 460 patients who had single nodules, 258 (56.0%) had more than one nodule with ultrasonography. It was determined that, out of 907 patients, diagnosis of 553 (60.9%) patients changed in our study. In conclusion, the results of our study necessitate the use of ultrasonography as a complementary method to physical examination in the diagnosis of thyroid diseases, especially thyroid nodules.

Key words: Thyroid nodule, ultrasonography, palpation

Introduction

An enlarged thyroid gland is called goiter; generalized enlargement is termed diffuse goiter, irregular or lumpy enlargement is called nodular goiter (1). Thyroid nodules are very common, the prevalence is reported as being 5-50% in different series. In a study involving 1000 healthy volunteers, one or more thyroid nodules were identified in 34.7% of subjects (2). Widely differing percentages of prevalence reported in the studies are due to the use of various methods in the diagnosis of thyroid nodules in these studies.

Although a large proportion of thyroid nodules are benign, it is important to diagnose the nodule and apply appropriate treatment and follow-up, especially

because of the possibility of thyroid cancer (3). The most widely used method for the diagnosis of thyroid nodules is palpation. The ease with which a nodule can be palpated depends on its location and size and the anatomy of the patient's neck (4). However, it is not possible to diagnose thyroid nodules using palpation in the majority of cases, especially nodules smaller than 10 mm. But ultrasonography is sensitive and capable of detecting many small, nonpalpable thyroid nodules (5,6). Therefore, in many patients that were evaluated as having normal or diffuse goiter with palpation nodular goiter can be diagnosed with ultrasonography. Also, ultrasonography is an ideal technique for establishing whether a palpable cervical mass is within or adjacent to the thyroid and for differentiating thyroid nodules from other neck masses (7). In addition, thyroid ultrasonography is particularly useful for measuring the size of the nodule and calculating the volume. Different formulas have been used for calculation of volume from the

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measured dimensions (1,8). While ultrasonography was considered necessary only for the follow-up of thyroid nodules in previous years, recently, its use in initial evaluation in patients suspected of having diffuse or nodular goiter has been gaining increasing importance.

In this study, we aimed to compare the diagnosis of patients obtained with physical examination or ultrasonography in order to evaluate the change in diagnosis of patients after ultrasonography.

Materials and Methods

Nine hundred and seven patients (745 females, 162 males; mean age: 40.9 ± 11.7 years) treated and followed up for thyroid disease in the Endocrinology Department of Ege University Hospital were included in the study. Diagnoses of patients were classified as normal, diffuse goiter, solitary nodule and multinodular goiter according to physical examination and ultrasonography. Physical examination (palpation) findings and ultrasonography results of the patients were analyzed and compared.

Thyroid ultrasound examination was performed with a real-time instrument using a 7.5 mHz linear transducer in the Radiology Department of Ege University Hospital. Statistical analyses were performed by using χ^2 test with SPSS program.

Results

The comparison of the results obtained with palpation and ultrasonography in the evaluation of 907 patients treated with either diffuse or nodular goiter are presented in Table 1. It was seen that 13 patients with solitary nodules and 12 patients with multinodular goiter diagnosed in ultrasonography had been evaluated as normal with thyroid palpation. Also, out of 261 patients evaluated as having diffuse enlargement in the thyroid gland by palpation, 5 patients (1.9%) were evaluated ultrasonographically as normal, 82 patients (31.5%) had single nodules and 152 patients (59.3%) had multinodular goiter. Only in 19 patients (7.3%), were ultrasonography and palpation findings the same. Generally, of the 261 patients evaluated as having diffuse goiter with palpation, 237 (90.8%) patients had nodules in ultrasonography. Out of 460 patients palpated for single nodules, 184 (40.0%) patients had single nodules in ultrasonography. While 9 (2.0%) of these patients

Table 1. Comparison of the results obtained with palpation and ultrasonography

Palpation Findings	Ultrasonography Findings				Total
	Normal	Diffuse Goiter	Solitary Nodule	MNG	
Normal	0 (%0)	0 (%0)	13 (%52)	12 (%48)	25
Diffuse					
Goiter	5 (%1.9)	19 (%7.3)	82 (%31.5)	155 (%59.3)	261
Solitary					
Nodule	9 (%2)	9 (%2)	184 (%40)	258 (%56)	460
MNG	2 (%1.2)	3 (%1.8)	5 (%3.1)	151 (%93.8)	161
Total	16	31	284	576	907

MNG: Multinodular goiter

had a normal thyroid gland and 9 (2.0%) were evaluated as having diffuse goiter, in 258 (56.0%) patients, one or more nodules were imaged in addition to the physically diagnosed nodule. The difference between palpation and ultrasonography results was found to be statistically significant ($p < 0.001$). Out of 161 patients evaluated as having multinodular goiter by palpation, 151 patients (93.8%) were confirmed with the same diagnosis ultrasonographically and only 10 patients had contradicting ultrasonography and palpation results (Table 1).

Discussion

Physical examination is the leading method used for the diagnosis of diffuse or nodular goiter. However, despite the fact that true diagnosis by palpation is possible, as more advanced diagnostic methods become more widespread, it is observed that the diagnosis obtained by physical examination was changed in many patients. It is reported that the sensitivity of the palpation method is 10-41% and increases with increasing nodule size (9). The fact that 89% of the palpated nodules are 10 mm and above in size indicates that it is difficult to identify nodules smaller than 10 mm with physical examination (10). However, solid thyroid nodules as small as 3 mm in diameter and cystic nodules as small as 2 mm can be readily detected using high-frequency ultrasonography (11,12). Since much smaller nodules can be identified through ultrasonography, nodular goiter percentage increases to a greater extent. In a series of 100 patients, palpable nodules were identified in 21 (21%) of 100 subjects, with nine solitary nodules (9%) and 12 multiple nodules (12%). In comparison, only 33

subjects were found to be free of any nodules by ultrasonography. Of the 67 subjects with abnormal ultrasonographic findings, 22 had solitary nodules (22%) and 45 had multiple nodules (45%) and the nodule incidence was found as 67% (13). In a large series, the incidence of thyroid nodules at ultrasonography was found as 30%, but palpable goiter was found as 9.8% to 14.6%, differing according to the iodine status of the region (14). In another study where 277 patients were evaluated, 77 (27.8%) patients had goiter according to palpation and out of 200 patients who were evaluated as normal by palpation, it was observed that 37 (18.5%) patients had thyroid pathology with ultrasonography (15). Also in a study that included 101 women without any previous thyroid disease, thyroid abnormalities were found in 36 (35.6%) subjects with ultrasonography (16). In a series evaluated as pathological after surgery, it was shown that a portion of nodules can be detected neither by ultrasonography nor by palpation, and the median diameter of non-palpable and ultrasound undetected nodules was 0.5 cm (17).

In our study, of 907 patients who were followed up because of thyroid disease, palpation and ultrasonography results were compared and it was determined that out of 261 patients having diffuse thyroid enlargement with palpation, 82 (31.5%) patients had single nodules and 155 (59.2%) patients had multinodulargoiter. It was also seen that out of 460 patients who had single nodules with palpation, 258 (56%) had more than one nodule. On the contrary, in patients who had multinodular goiter with palpation, it is found that for a great majority, (93.8%) diagnosis does not alter in ultrasonography. The results show the importance of ultrasonography especially for patients evaluated as having diffuse goiter or a single nodule in respect of the existence of nodules undetectable by physical examination, this being similar to results of previous studies. On the other hand, for 18 (3.0%) patients diagnosed as having multinodular goiter by palpation, nodules could not be imaged in ultrasonography. Series with much higher percentages are reported in the literature (18). In total, out of 907 patients, diagnosis of 553 (60.9%) patients changed in our study. It is also reported in a study involving 223 patients that diagnosis of 63.0% of the patients changed after ultrasonography (19).

Although a majority of nodules are undetectable by palpation, since the incidence of incidentalomas

is great and they are largely benign, it is suggested that nonpalpable nodules can be followed up every 6-12 months by physical diagnosis (20). Nevertheless, it was shown that also for patients with increased malignancy risk, who have previously received neck radiation, evaluation by ultrasonography is more sensitive compared to palpation follow-up (21).

In conclusion, similar to the recent literature, for a large majority, patients' diagnosis changed after ultrasonography in our study, so the results necessitate the use of ultrasonography, which is a noninvasive method, as a complementary method to physical examination in the diagnosis of thyroid diseases, especially thyroid nodules.

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