

The Value of Fine- Needle Aspiration Biopsy in the Management of Thyroid Nodules

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Thyroid nodules are an extremely common problem and approximately 5% of nodules are malignant. Fine-needle aspiration biopsy (FNAB) is the most useful diagnostic method for differentiating benign from malignant thyroid nodules. In this study, the results of FNAB and pathologic diagnosis after surgery were compared to evaluate the confidence ratio of FNAB and determine the approach to patients with thyroid nodules. Ninety-nine patients, (82 females, 17 males; mean age: 42.2 ± 10.6 years) who underwent FNAB and then underwent surgery because of thyroid nodules, were evaluated retrospectively. The pathologic examination of surgical material of 10 of the 71 patients who had benign cytology with FNAB revealed malignancy, so the false negativity ratio was 14.1%. Six (42.9%) of the 14 patients that underwent surgery because of suspicious FNAB results were diagnosed as malignant histologically. But the pathological results of all (100%) patients evaluated as malignant with FNAB, were malignant. Therefore, these results support the literature suggesting that FNAB is the main procedure in the management of thyroid nodules. Thyroidectomy should be performed especially in patients whose FNAB results are malignant or suspicious. But also, we have to be careful while assessing the management of thyroid nodules, even if the FNAB result is benign cytology because of the high false negativity ratio of the test.

Key words: Thyroid nodule, fine-needle aspiration biopsy

Introduction

Thyroid nodules are extremely common, particularly among women, and approximately 5% of nodules are malignant (1,2). Fine-needle aspiration biopsy (FNAB) is the most important procedure for differentiating benign from malignant thyroid nodules. Thus, it is recommended as the first step in the diagnosis of thyroid nodules. The accuracy of FNAB is about 95% (3,4). It is safe, inexpensive and reliable. It has no serious complications and can be easily performed (5,6).

FNAB decreased surgery by 50% in patients with thyroid nodules. At the same time it increased the diagnosis of malignancy ratio after surgery (7). It permits identification of many malignant lesions that would otherwise require a second operation to complete a total thyroidectomy (8). But, it should be done by a competent clinician and evaluated by an experienced pathologist to increase the efficacy of the procedure. If the size of the nodule is small, ultrasound-guided FNAB should be performed (9). Even with ultrasonographic guidance, the minimal tumour size detectable by FNAB is around 5 mm (10). And, criteria for specimen adequacy to exclude malignancy are more stringent than those to establish malignancy (11).

In the present study, FNAB results and pathologic diagnosis after surgery were compared to evaluate the confidence ratio of FNAB and determine the

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approach to patients with thyroid nodules according to FNAB results.

Materials and Methods

Ninety nine patients who were followed up by the Endocrinology Department of Ege University Hospital were included in the study. Eighty-two patients were female, 17 patients were male and mean age was 42.2 ± 10.6 years. They underwent fine-needle aspiration biopsy and thyroidectomy. FNAB results were classified as benign, suspicious, malignant and non-diagnostic cytology. The results of FNAB and pathologic evaluation of surgical material were evaluated and compared. Statistical analyses were performed by using χ^2 test with SPSS program.

Results

The results of FNAB of 99 patients were as follows: 71 benign, 7 malignant, 14 suspicious, 7 non-diagnostic cytology. The pathologic examination of surgical material of 10 of the 71 patients who had benign cytology with FNAB revealed malignancy, so the false negativity ratio was 14.1%. Six (42.9%) of the 14 patients that underwent surgery because of suspicious FNAB results were diagnosed as malignant histologically. All of the 7 patients who had malignant cytology were also malignant in pathological evaluation. On the other hand, 7 patients with non-diagnostic FNAB results were diagnosed as benign histologically (Table 1).

Table 1. Results of FNAB and pathologic evaluation in thyroidectomized patients

Fine Needle Aspiration Biopsy	Pathology		Total
	Benign	Malignant	
Benign Cytology	61 (%85.9)	10 (%14.1)	71
Suspicious Cytology	8 (%57.1)	6 (%42.9)	14
Malignant Cytology	0 (%0)	7 (%100)	7
Nondiagnostic Cytology	7 (%100)	0 (%0)	7
Total	76	23	99

Discussion

Endemic goiter is still an important and underestimated health concern in Turkey. The overall prevalence had been calculated as 30.3% by palpation in a national survey (12).

Thyroid nodules are important especially because of their malignancy risk. FNAB is the most effective procedure for differentiating benign and malignant

thyroid nodules. Therefore, it is recommended as the first step in the management of thyroid nodules. Studies have suggested that fine-needle aspiration biopsy of thyroid nodules is a sensitive and specific tool for the detection of thyroid cancers thus preventing unnecessary operations (13). In general, 20-30% of patients are referred for surgery on the basis of cytologic features (14,15). If a diagnosis of a benign or definitely malignant condition has been made by means of FNAB preoperatively, FNAB provides sufficient information for determining the extent of thyroid resection (16). It is reported that FNAB has a sensitivity of 95% in the diagnosis of malignant nodules (17). In one study, only in one of 63 patients was malignancy identified by frozen section that was not diagnosed by FNAB (18). Sensitivity is affected by many factors such as location of biopsy, adequate material and participation of a competent clinician and experienced pathologist.

In a study in which the pathological results of 226 patients were evaluated, false negativity ratio was 13% and positive malignancy ratio was 99% (19). These results are concordant with our results. But, there are many studies that reported lower false negative ratios. Ertürk et al. found false negative ratios of 3% (20). In another series, malignancy was found in 76% of the nodules with malignant cytologic findings, 20% of the nodules with suspicious cytologic findings, and 9% of the nodules with benign cytologic findings (21). In the present study, the pathological results of all (100%) patients evaluated as malignant with FNAB, 42.9% of patients evaluated as suspicious and 14.1% of patients evaluated as benign cytology, were malignant. The false negativity ratio of FNAB is 14.1%, so if there is a risk or suspicion of malignancy, surgical treatment should be kept in mind as a treatment modality even if the FNAB result is benign cytology. But also, the malignancy ratio of patients with malignant or suspicious cytology is significantly higher than that of patients with benign cytology. Therefore, these results support the literature suggesting that FNAB is the main procedure in the management of thyroid nodules and that it is the "gold standard" (22).

In conclusion, FNAB is effective for differentiating benign from malignant thyroid nodules. Results suggested that thyroidectomy should be performed especially in patients whose FNAB results are malignant or suspicious. But also, we have to be

careful while assessing the management of thyroid nodules, even if the FNAB result is benign cytology, because of the high false negativity ratio of the test.

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