

Differential Diagnostics of Nodular Goiter

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ABSTRACT. Among numerous diagnostic methods fine-needle aspiration biopsy under ultrasonic examination is still considered to be an optimal method of diagnosing an euthyroid nodular goiter.

Analysis of the examination of 512 patients showed the high diagnostic value of this method at colloid nodes (sensitivity – 93.2%, specificity – 87.1%), adenomas (sensitivity – 72.5%, specificity – 91.6%), and autoimmune thyroiditis (sensitivity – 82.5%, specificity – 96.9%). The method allows us to select a group of patients with high risk level, suspected malignant tumour of the thyroid gland with a high probability (sensitivity – 80.7%, specificity – 93%) and conduct adequate surgical treatment according to principles of oncology. © 2009 *Bull. Georg. Natl. Acad. Sci.*

Kew words: *nodular goiter, thyroid.*

Nodular goiter is a collective concept, commonly used relative to the thyroid gland diseases, having a distinctive morphological base. Those may be nodular endemic and sporadic goiter (microscopically mainly colloidal-proliferative), adenomas of the thyroid gland, malignant growths, cysts, autoimmune thyroiditis (nodule imitation by hypertrophic parts of gland tissue) or diffusion nodular diseases when thyroid gland lesions (adenoma, nodular goiter, tumour) are combined with autoimmune thyroiditis, diffusion-toxic and other kinds of goiter. Nonthyroid diseases such as cysts in the middle and side of the neck, lipoma and others also can imitate node formations of the thyroid gland.

At the present-day development stage of endocrine surgery it is necessary first of all to have adequate information about the morphological structure of these node formations [1-5].

In spite of a great number of diagnostic methods, such as ultrasonic examination, color dopplerography, spiral computerized tomography, magnetic resonance

tomography, radionuclide scintigraphy, lymphography, radio-thermometry and so on, the problem of timely differential diagnostics of non-malignant and malignant thyroid neoplasms is not completely solved yet [5-8]. Active debate about the volume of surgical operation in various morphological cases continues to the present day [3, 8].

Two basic techniques of morphological diagnostics are known: microscopic analysis of punctates received as a result of fine-needle puncture (aspiration and non-aspiration) biopsy, and macro- and microscopic analysis of a resected thyroidal tissue.

The method of fine-needle puncture biopsy is related to methods of small-invasive and adequately informative morphological diagnostics. Though epithelial cells of the thyroid gland are bond like intima, it is difficult to split cell bonds, therefore obtaining information material is sometimes complicated, and to interpret the results of small quantity punctate analysis is hindered. At the same time, the volume of information on

microscopic study of punctates by literary data reaches 90-95% [1]. Diagnostic accuracy is even higher while conducting puncture biopsy under ultrasonic examination. Then, taking into consideration ultrasonic semiotics, one selects suspicious pathologic formations and performs puncture biopsy with further cytological study of punctates [1, 4, 9]. This diagnostic algorithm is the most optimal method to diagnose a nodular goiter. The method is especially effective at multi-nodular goiter lesions. It allows us to describe ultrasonic semiotics of almost all nodules and perform their target biopsy.

Since 1997 we have investigated 512 patients with various diseases of the thyroid gland. Among other investigations puncture-aspiration biopsy of nodular formations of the thyroid gland combined with ultrasonic examination was performed for each patient and cytological analysis of the bioptic material was studied. Ultrasonic investigation helped to fix foci with suspicious changes, also determine the most eligible site, direction and depth of puncture. We punctured all suspicious nodules, paying special attention to neoplasms with decreased echogenicity, irregular circuit and dystrophic changes [10, 11]. The data of cytological examinations were compared with the results of histological study.

Analysis of investigation results showed that in the case of colloid goiter the sensitivity of fine-needle aspiration biopsy under ultrasonic control totaled 93.2% and the specificity – 87.1%. In the case of adenomas the sensitivity of the method totaled 72.5% and specificity – 91.6%.

The cytological picture of classical papillary carcinoma, when having material of adequate quantity, makes possible to diagnose with almost absolute accuracy

Most inaccuracy in the results of cytological studies is detected in cases of papillary carcinoma and follicular malignance, presenting a relatively distinctive follicular variant [12, 13]. This is caused by the fact that while conducting a cytological investigation of punctates it is impossible to tell the difference between a malignant high differentiated form and an adenoma developed from a follicular cells (it is possible to diagnose according to data on capsular, stromal and/or vascular invasion, which is allowed only while carrying out a histological study).

According to the recommendation of the American Thyroid Association, among cytological diagnoses a group of cases of follicular and Hürtle cell neoplasia suspicious for papilar carcinoma is selected [5, 10, 13].

In these cases the following tactics is optimal: if the mentioned examinations raise doubts concerning the malignancy developed from follicular cells (adenoma or adenocarcinoma), it is necessary to perform surgical treatment according to criteria of oncology and stage of disease. This measure precludes the need of reoperations after planned histological examination. This, in its turn, excludes possible complications, whose probability is especially high after reoperations. Those are lesions of recurrent nerves, trachea, thick blood vessels of neck, parathyroid gland [14, 15].

Because of the fact that in cases of follicular adenomas and adenocarcinomas surgical operations of equal volumes are planned, it is expedient to conduct an ultrasonic study and determine aspiration biopsy sensitivity and specificity in the whole group of patients with the so-called “suspicious nodular formations” in the thyroid gland [5, 13]. In this case sensitivity of fine-needle aspiration target biopsy totals 80.7% and specificity amounts to 93%. Sensitivity of the method at autoimmune thyroiditis is high – 82.5% and specificity – 96.9%.

Finally, the following should be noted. Development of habits of biopsy is of especial significance to decrease the number of surgical misadventures [9]. Besides, wide propagation of the method was always hampered by a number of probable complications, such as process dissemination, rebleeding, inflammation, etc. However, the danger of these possible complications was mostly evaluated *a priori*. Using the method of punctuate biopsy in clinical practice showed that the character of those complications is overestimated to a certain extent [4]. Our investigations also showed the safety of the method in the case when the procedure is correctly performed. No complications while conducting the procedure or after that have been recorded.

Thus, fine-needle biopsy under ultrasonic control presents a method of high diagnostic value in the examination of thyroidal gland nodular formations. Ultrasonography enables, taking into consideration ultrasonic semiotics, to isolate suspicious formations in the gland and conduct their target biopsy, besides, obviating complications in procedures. Differential diagnostics of adenomas and adenocarcinomas, developed from follicular cells, is complex, but it is possible in this case to distinguish a general group of patients with the so-called “suspicious formations” for malignancy and to perform surgical treatment according to the principles of oncology, obviating the need for in repeated surgical operations.

სამედიცინო მეცნიერებანი

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მიუხედავად დიაგნოსტიკური მეთოდების სიმრავლისა, კვანძოვანი ვეტირეოიდული ჩიყვის დროს ოპტიმალურ დიაგნოსტიკურ მეთოდად რჩება წვრილნემსოვანი ასპირაციული ბიოფსია ულტრაბგერითი გამოკვლევის კონტროლის ქვეშ.

ჩატარებულია 512 პაციენტის გამოკვლევის შედეგების ანალიზი, რომელმაც აჩვენა მეთოდის მაღალი დიაგნოსტიკური ღირებულება კოლოიდური კვანძების (მგრძნობელობა – 93,2%, სპეციფიკურობა – 87,1%), ადენომების (მგრძნობელობა – 72,5%, სპეციფიკურობა – 91,6%), ავტომიმუნური თირეოიდიტის (მგრძნობელობა – 82,5%, სპეციფიკურობა – 96,9%) დროს. მეთოდი საშუალებას იძლევა დიდი ალბათობით გამოიყოს ფარისებრი ჯირკვლის ავთვისებიან დაზიანებებზე საექვო, მაღალი რისკის პაციენტთა ჯგუფი (მგრძნობელობა – 80,7%, სპეციფიკურობა – 93%) და ჩატარდეს ადეკვატური მოცულობის ოპერაციული მკურნალობა ონკოლოგიური პრინციპების შესაბამისად.

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