MODERN LABORATORY DIAGNOSTICS OF NODULAR GOITER

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Abstract: Nodular goiter is not just a physiological phenomenon, but a whole metaphor that permeates the life and being of many people. Its range of meanings ranges from purely medical aspects to deep philosophical reflections on existence. It seems to function in two planes: on the one hand, it is a manifestation associated with metabolic processes in the body, and on the other, it is a symbol of inner struggle and the search for harmony.

In ancient texts, nodular goiter was often described through the prism of fear and misunderstanding. People who faced this disease felt the burden of prejudice and superstition. Over time, scientific progress has made it possible to look at nodular goiter as a challenge that must be met with courage and knowledge.

Key words: Nodular goiter, DNA, pathogenesis, diagnosis, laboratory, thyroid gland, differential diagnosis.

СОВРЕМЕННАЯ ЛАБОРАТОРНАЯ ДИАГНОСТИКА УЗЛОВАГО ЗОБА

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Аннотация: Узловой зоб - это не просто физиологическое явление, а целая метафора, которая пронизывает жизнь многих людей. Диапазон его значений простирается от чисто медицинских аспектов до глубоких философских размышлений о существовании. Кажется, что он функционирует в двух плоскостях: с одной стороны, это проявление, связанное с обменными процессами в организме, а с другой - символ внутренней борьбы и поиска гармонии.

В древних текстах узловой зоб часто описывался через призму страха и непонимания. Люди, столкнувшиеся с этим заболеванием, ощутили на себе груз предрассудков и суеверий. Со временем научный прогресс позволил рассматривать узловой зоб как проблему, которую необходимо решать мужественно и со знанием дела.

Ключевые слова: Узлавой зоб, ДНК, патогенез, диагностика, лаборатория, шитовидная железа, дифференциальная диагностика.

Modern medicine offers a variety of approaches to the treatment of nodular goiter, but the most important aspect remains the social aspect — support and understanding from society. Only through joint efforts can we overcome not only the physical side of the problem, but also destroy the stigma associated with it. Thus, nodular goiter becomes not only a matter of health, but also the ability to detect human kindness and mutual understanding.

The etiology of nodular goiter is a complex and multifaceted process that depends on a combination of various factors. First of all, it should be noted that growths in the thyroid gland can form as a result of iodine deficiency in the diet. Iodine plays a key role in the production of thyroid hormones, and its deficiency can lead to hyperplastic changes in the tissues of the gland, thus provoking the formation of nodes.

In addition, genetic predisposition is also of great importance. It is not uncommon for nodular goiter to occur in members of the same family, indicating the possible hereditary nature of the disease. The influence of environmental factors and radiation, especially in regions prone to nuclear tests or accidents at nuclear power plants, is also confirmed by a number of studies. [1, 4, 7 , 10,14,18].

Hormonal changes in women, especially during pregnancy or menopause, can contribute to the development of nodules. And finally, inflammatory diseases of the

thyroid gland, such as thyroiditis, can negatively affect its functional state, increasing the risk of nodular goiter formation.

The pathogenesis of nodular goiter is characterized by many factors, including genetic predisposition, iodine deficiency in the diet, inflammatory processes in the thyroid gland and exposure to exogenous toxins. The development of nodular goiter may be associated with follicle hyperplasia, which leads to an increase in tissue volume. During the pathological process, changes in hormonal production are observed, including both hyperthyroidism and hypothyroidism, depending on the activity of the nodes.

The molignization of nodes, that is, their transformation into a malignant form, is a consequence of genetic mutations and cellular signaling disorders. At the same time, it is important to take into account the influence of the environment and concomitant diseases, such as autoimmune processes, which can provoke an increase in the thyroid gland. Improved diagnosis and understanding of molecular mechanisms play a key role in assessing the pathogenesis of nodular goiter, which allows timely and adequate treatment and prevention. Thus, nodular goiter is a multifaceted disease that requires an integrated approach both in diagnosis and in medical practice.

In nodular goiter, the clinical picture is highlighted by a variety of manifestations, which can range from mild changes to serious disorders. A characteristic feature of this disease is an enlargement of the thyroid gland, which often manifests itself as a noticeable tumor on the neck. This increase may be accompanied by discomfort, difficulty swallowing or breathing.

Nodular formations may remain asymptomatic in the early stages, however, as they progress, symptoms of hypothyroidism may appear, such as fatigue, weight gain, depression and slowing of the heart rate. An important aspect is the presence of symptoms of hyperthyroidism, including sweating, palpitations and weight loss.

Diagnosis of nodular goiter includes ultrasound examination, analysis for thyroid hormones and, in some cases, node biopsy. Treatment can range from observation to drug therapy or surgery, depending on the nature and size of the nodes.

Presenting the complexity of the clinical picture, nodular goiter requires an individual approach and careful supervision by medical specialists.

Ultrasound diagnosis of nodular goiter is an important tool in assessing the condition of the thyroid gland and identifying possible pathologies. Ultrasound, or ultrasound examination, allows you to visualize the structure of the gland, revealing the presence of nodes, their sizes and characteristics. Using this method, it is possible to determine whether the node is benign or malignant, which is crucial for choosing further treatment tactics. [2, 5, 9 , 10,14,17].

Modern ultrasound machines provide high image quality, allowing specialists to analyze the results more accurately. In the course of the study, the echogenicity of

nodes, their contours, the presence of calcifications and vascular blood supply are evaluated, which helps in the formation of a clinical diagnosis. It is important to note that ultrasound is a safe and painless method that does not require special patient training and can be performed on an outpatient basis. Thus, ultrasound diagnosis of nodular goiter is an indispensable step in the diagnosis of thyroid diseases, contributing to the early detection of pathologies and providing patients with timely and adequate treatment.

In the nodular ECG, where the currents of life and death intertwine into a complex dance on the screen, secret signs appear, harbingers of invisible changes. Heart rhythms, similar to the sounds of an ancient symphony, tell a story that only an experienced observer can decipher. The eye of the tape recorder will catch the finest strokes, preferring not to miss a single detail — neither waves, nor teeth, nor intervals of silence, sometimes so eloquent.

Each line is not just a graph, but a living embodiment of emotions, experiences and even the struggle for which the heart beats. The stripes indicate a wide range of conditions: from anxious excitement to quiet sadness, from joy to fear. There is uncertainty at the intersection of these lines, which protects against incorrect conclusions, but opens the door to understanding deep internal processes

Thus, the ECG becomes not just a medical instrument, but a window into the human soul, allowing you to look into those secret places where long-standing fears, hopes and unconscious desires are stored. Every time we look at these patterns, we come into contact with the essence of life. [14,17].

Laboratory diagnosis of Nodular goiter is an important step in the detection and assessment of thyroid diseases. Nodular goiter is characterized by the formation of nodules in the thyroid gland tissue, which can have various causes, including genetic predisposition, iodine deficiency, as well as the influence of environmental factors.

Various laboratory methods are used to diagnose this pathology, including blood tests for the level of hormones such as thyroxine (T4) and triiodothyronine (T3), as well as thyroid-stimulating hormone (TSH). Changes in their levels may indicate hyperthyroidism or hypothyroidism, which determines further treatment tactics.

In addition, serological tests are often used in laboratory practice to determine antibodies to thyroglobulin and thyroperoxidase, which makes it possible to identify autoimmune thyroid diseases such as Hashimoto's disease or Graves' syndrome.

A general blood test, biochemical examinations and ultrasound diagnostics of nodes also play a significant role in establishing the diagnosis and monitoring the patient's condition. [2, 5, 6 , 8,14,16].

In nodular goiter, a general blood test is an important diagnostic tool that allows you to assess the state of the body and the functioning of the endocrine system. In the presence of goiter, changes in the blood test may indicate various pathologies, such as

hypothyroidism or hyperthyroidism. The level of thyroid hormones such as TSH, T3 and T4 is becoming a key indicator that will help doctors understand how the thyroid gland affects the patient's metabolism and overall health. In addition, attention is paid to the level of hemoglobin, leukocyte formula and platelet count, which can reveal concomitant inflammatory processes or anemia. The condition of the thyroid gland can also suffer from various factors, including hereditary predispositions, iodine deficiency and environmental exposure. The interpretation of the analysis should be carried out by a qualified specialist who will be able to evaluate the data obtained in a complex, taking into account the clinical manifestations and anamnesis of the patient. This is the only way to determine the optimal strategy for diagnosis and treatment, which will ultimately lead to an improvement in the patient's quality of life.

Treatment of nodular goiter, a condition characterized by the formation of nodules in the thyroid gland, requires an integrated approach and careful diagnosis. First of all, it is necessary to determine the nature of the nodes — whether they are benign or malignant. To do this, an ultrasound examination is performed, and if necessary— a biopsy.

If the nodes do not cause symptoms and have no signs of malignancy, their dynamic monitoring becomes the main stage of treatment. It is important to monitor their size and condition. In cases where the nodes are actively growing or causing discomfort, they resort to drug therapy, which may include hormonal drugs to correct the level of thyroid hormones. [1, 3, 7 , 10,15,17].

In more serious cases, when there is a threat of malignancy or the size of the nodes is significant, the possibility of surgical intervention is considered — thyroidectomy or resection of a part of the thyroid gland. Early diagnosis and an individual approach to the treatment of nodular goiter allow us to achieve high results, preventing the development of complications and providing patients with a quality of life.

Prevention of nodular goiter is an important aspect of maintaining thyroid health. Nodular formation can lead to various disorders, and its early diagnosis and prevention play a key role. To prevent the development of nodular goiter, it is recommended to adhere to a balanced diet rich in iodine, which is especially important for regions with a deficiency of this trace element. Regular consumption of seafood, seaweed and iodized salt creates the basis for ensuring the normal functioning of the thyroid gland.

Physical activity also affects the general condition of the body and the function of the endocrine system. Moderate exercise helps maintain metabolism and hormonal balance. Additionally, it is worth avoiding stress and nervous overloads, since the psychoemotional state of a person can have a significant impact on the health of the thyroid gland. [2, 5, 9 , 10,14,17].

Conclusions. Regular medical examinations and monitoring of thyroid hormone levels can identify potential problems in the early stages. Contacting an endocrinologist, especially if there is a hereditary predisposition, will be an important step towards the prevention of nodular goiter. A healthy lifestyle, a balanced diet and an attentive attitude to your body are the key to successful prevention.

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