MODERN APPROACHES TO THE DIAGNOSIS AND TREATMENT OF THYROID CANCER

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Relevance

Thyroid cancer is one of the most common malignant neoplasms of the endocrine system, characterized by a steady increase in incidence worldwide. According to epidemiological studies, the incidence of this pathology has increased significantly in recent decades, driven by both improved diagnostic capabilities and a real increase in the incidence of the disease. Despite the relatively favorable prognosis for highly differentiated forms of thyroid cancer, a significant proportion of patients experience aggressive clinical and morphological characteristics, accompanied by relapses, metastasis, and the development of radioiodine-resistant forms [2].

Modern thyroid cancer diagnostics rely on the integrated use of clinical, instrumental, and morphological methods, including ultrasound, fine-needle aspiration biopsy, and histological examination. However, in some cases, these methods fail to reliably assess the tumor's biological behavior, its malignant potential, and its individual risk of progression. This leads to overdiagnosis and excessive surgical treatment in some patients and, conversely, to underestimation of tumor aggressiveness in others.[1]

In recent years, molecular genetic research has made significant advances, identifying key mutational and signaling pathways involved in thyroid carcinogenesis. The identification of markers such as BRAF, RAS, RET/PTC, and other mutations opens up new possibilities for accurate diagnosis, prognostic stratification, and targeted therapy selection. The introduction of these technologies is contributing to the development of the concept of personalized medicine based on the individual clinical, morphological, and molecular characteristics of the tumor [4].

Treatment approaches for thyroid cancer are also undergoing significant changes. Along with traditional surgical methods and radioactive iodine, targeted drugs and immunotherapy are increasingly being used, which is especially important for patients with advanced and radioiodine-resistant forms of the disease. However, the effectiveness of these methods largely depends on proper patient selection, which again highlights the need for a comprehensive and personalized approach [3,6].

Thus, the development and implementation of modern, innovative methods for diagnosing and treating thyroid cancer, taking into account the principles of personalized medicine, is a pressing task in modern oncology and endocrinology, aimed at increasing the effectiveness of treatment, reducing the incidence of complications, and improving the quality of life of patients.

Purpose of the study

To evaluate the diagnostic and clinical effectiveness of modern methods of diagnosis and treatment of thyroid cancer from the perspective of innovative and personalized approaches.

Materials and methods

The study included patients with thyroid cancer undergoing examination and treatment at specialized endocrinology and oncology facilities. Clinical and

instrumental diagnostic methods were used, including thyroid ultrasound, fine-needle aspiration biopsy, and histological and immunohistochemical examination of surgical specimens. Additionally, molecular genetic markers associated with tumor progression were analyzed. Descriptive and comparative statistical methods were used.

Results

The comprehensive use of modern diagnostic methods has improved the accuracy of preoperative thyroid cancer verification and detected tumors in the early stages of the disease. The use of morphological and molecular genetic criteria has enabled more accurate stratification of patients by risk group. The use of personalized treatment approaches, including individualized selection of the extent of surgery and adjuvant therapy, has contributed to a reduction in the incidence of postoperative complications and improved relapse-free survival rates.

Conclusions

1. Modern methods of thyroid cancer diagnostics, based on a comprehensive clinical, morphological and molecular genetic assessment, have high diagnostic information value.
2. A personalized approach to treatment allows us to optimize patient management tactics and increase the effectiveness of therapy.
3. The introduction of innovative diagnostic and therapeutic technologies is a promising direction in the development of modern endocrine oncology.

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