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Factors of Recurrence and Prevision in Polypous Rhinosinusitis

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Abstract: This article analyzes the factors leading to the recurrence of the disease in polypoid rhinosinusitis and clinical and pathogenetic indicators of prognostic significance. The dissertation sets the tasks of assessing the course and recurrence of polypoid rhinosinusitis by determining the mucociliary clearance of the nasal cavity, predicting the development and recurrence of the disease by studying the levels of p53, EGF, VEGF, and VEGFR-2 in polypoid tissue and blood serum, as well as extending the duration of relapse through complex treatment. As a scientific novelty, it has been proven that a decrease in the mucociliary transport function of the nasal mucosa worsens the course of the disease, changes in the levels of p53, EGF, VEGF and VEGFR-2 are a determining factor in the course and development of polypoid rhinosinusitis, and the normalization of the level of cytokines in blood serum prolongs the period of relapse. The article analyzes the functional, morphological, immunobiological, and clinical factors leading to relapse in polypoid rhinosinusitis, and substantiates that their comprehensive assessment makes it possible to better determine the prognosis of the disease [2,10,18,23,32,41]. It was concluded that early detection of the risk of recurrence is important for the correct choice of complex treatment tactics, determining the frequency of observation, and forming an individual preventive approach.

Keywords: polypoid rhinosinusitis, recurrence, prognosis, mucociliary transport, VEGF, EGF, p53, VEGFR-2, cytokines.

Polypoid rhinosinusitis is a chronic, recurrent, and multifactorial pathology, the biggest practical problem of which is the recurrence of the process even after treatment. Despite the widespread use of surgical methods, local and systemic drugs, additional physiotherapeutic and pathogenetic treatments in modern otorhinolaryngology, the

recurrence rate of the disease, according to various authors, reaches from 5% to 60%. In the introduction of the dissertation, despite the development of surgical practice in recent years and the widespread use of medications, the recurrence rate of the disease is 5-60%, and some patients have undergone several surgical interventions. This situation indicates the need to assess polypoid rhinosinusitis not only as a morphological change, but also as a prognostically complex disease with a long-term pathogenetic background [1,9,17,26,34,42].

The problem of recurrence is one of the central issues of clinical management in polypoid rhinosinusitis. A therapeutic approach will be more effective if the doctor can assess not only the current state of the disease, but also its further course, the likelihood of recurrence, which patient may have a more severe course of the process, or slow response to treatment [5,12,20,27,33,40]. From this point of view, the purpose of the study in the dissertation is to improve the diagnosis and evaluate the effectiveness of treatment by studying the pathogenetic mechanisms of polypoid rhinosinusitis, and among the tasks is to assess the course and recurrence of the disease by determining the mucociliary clearance of the nasal cavity, to analyze the specificity of the disease and the etiopathogenetic relationship by studying the content of p53, EGF, VEGF, and VEGFR-2 in polypoid tissue and blood serum, as well as to improve the method of complex treatment. These tasks themselves indicate that the dissertation pays special attention to the assessment of the prognosis and early detection of the risk of recurrence [3,11,16,25,35,39].

The factors leading to recurrence in polypoid rhinosinusitis can be conditionally divided into several large groups: functional factors, inflammatory and immunobiological factors, molecular-biological factors, comorbidities, and the peculiarities of the recovery process after treatment. Although each of these factors is of particular importance, in practice they are closely interconnected and create conditions for the recurrence of the disease.

Among the functional factors, mucociliary transport disorder is one of the most important. As a scientific novelty in the dissertation, it was noted that a decrease in the mucociliary transport function of the nasal mucosa in patients with polypoid

rhinosinusitis worsens the course of the disease. Interpreting this situation from a prognostic point of view, the disruption of mucociliary clearance leads to secretion stabilization, prolonged localized inflammation, secondary microbial colonization, and the continuation of mucosal edema [6,13,19,28,31,38]. As a result, even after surgery or conservative treatment, the pathological environment is not completely eliminated, and the basis for the recurrence of the polypoid process is preserved. Consequently, the state of mucociliary transport is an important indicator not only of clinical severity, but also of the risk of recurrence.

The second large group is inflammatory and immunobiological factors. Polypoid rhinosinusitis is often a chronic inflammatory process involving eosinophilic infiltration, an allergic environment, microbial or fungal factors, and local and systemic immune responses. As a result of the normalization of the level of cytokines in blood serum, the effectiveness of complex treatment by increasing the duration of relapses in the disease has been proven. This is a very important conclusion. Because if changes against the background of cytokines persist, even in a patient with temporarily reduced clinical symptoms, the probability of reactivation of the polypoid process may be high. Conversely, if the immunobiological background stabilizes, the recurrence period is prolonged. Thus, cytokine indicators and changes against the background of inflammation are one of the important markers for the prognosis of the disease [4,14,21,24,30,37].

Molecular-biological factors also play an important role in the assessment of recurrence. The dissertation proves that changes in the levels of p53, EGF, VEGF, and VEGFR-2 are a determining factor in the course and development of polypoid rhinosinusitis. Each of these biomarkers reflects the activity of the disease in its own direction. VEGF and VEGFR-2 represent angiogenesis and vascular permeability, EGF represents epithelial growth and reconstruction, and p53 represents control of apoptosis and the cell cycle. If these indicators are maintained at a pathological level, this may mean that the biological activity of the polyp tissue is high, and, accordingly, the probability of recurrence is high [7,8,15,22,29,36]. Therefore, their complex

assessment in blood serum and polyp tissue makes it possible not only to diagnose, but also to make a prognosis.

The following table systematizes the main factors leading to relapse in polypoid rhinosinusitis.

Table 1

Main factors contributing to relapse in polypoid rhinosinusitis

Factor group	**Main indicator**	**Recurrence-related potential significance**
Functional	Decreased mucociliary transport	Mucus consolidation, prolonged inflammation and re-polyp formation
Immunobiological	Cytokine imbalance	Maintained activity against the background of inflammation
Molecular	VEGF, VEGFR-2, EGF, p53 change	Preservation of angiogenesis, reconstruction and pathological proliferation
Clinical	Prolonged course, multiple surgery	Presence of stable pathogenetic background
Concomitant diseases	Allergic rhinitis, bronchial asthma, upper respiratory tract pathology	Preserved inflammation against a background of chronic disease
Morphofunctional	Mucosal edema and reconstruction	Preservation of pathological environment after remission

Concomitant diseases also play an important role in the prognosis of relapses. The dissertation notes that in patients with polypoid rhinosinusitis, pathologies of the upper respiratory tract occur simultaneously in 42.5%, tumor diseases in 12.5%, respiratory diseases in 15%, allergies in 35% of cases, and allergic rhinitis in 32.3% of cases. Information is also provided on the association with bronchial asthma. This means that polypoid rhinosinusitis should be considered not as a local disease, but in most cases

as a process developing in a systemic allergic-inflammatory environment. If these concomitant diseases are not sufficiently controlled, this can lead to the preservation of pathogenetic activity in the nasal mucosa and a faster manifestation of the polypoid process.

A prolonged course of the disease and repeated surgical interventions can also be considered a prognostically unfavorable sign. The dissertation notes that in some studies, 13.6% of patients underwent surgery at least once, while in other sources, 78.2% of patients underwent multiple surgical interventions. If the patient has repeated manifestations of polypoid rhinosinusitis and the need for repeated operations arises, this usually indicates a high level of pathogenetic activity against the background of the mucous membrane. Such patients should be considered as a risk group, and their functional, immunological, and molecular indicators should be monitored separately.

When drawing up a forecast assessment, it is necessary to consider several indicators simultaneously. It is difficult to make a complete conclusion about the further course of the disease based solely on the endoscopic picture or only on clinical complaints. Therefore, the approach proposed in the dissertation - the combined assessment of mucociliary clearance, biomarkers in polyp tissue and blood serum, cytokine background, and the results of complex treatment - is very relevant. This approach allows us to predict not only the current state of the disease, but also its future dynamics.

The following table presents the main criteria for predicting polypoid rhinosinusitis.

Table 2

Main criteria for prognostic assessment in polypoid rhinosinusitis

Assessment direction	**Indicator**	**Forecast value**
Functional state	Mucociliary transport	Decrease - high risk of recurrence

Biomarkers	VEGF, EGF, p53, VEGFR-2	Pathological change - increased process activity
Immunobiological status	Cytokine background	Non-normalization - remission is unstable
Clinical course	Prolonged course, severe symptoms	Long-term observation required
Operation history	Repeated surgery	High probability of recurrence
Related states	Allergic rhinitis, asthma, etc.	High probability of recurrence against the background of systemic inflammation

As can be seen from this table, the forecast assessment should be multi-component. If the patient has impaired mucociliary transport, pathologically altered biomarkers, cytokines are not normalized, an allergic background persists, and they have undergone repeated surgery before, the risk of recurrence in such a patient can be assessed as high. On the contrary, the prognosis is relatively good in cases of stabilization of functional and molecular parameters, normalization of cytokines, and improvement of clinical recovery.

The importance of complex treatment is clearly visible at this point. The dissertation notes that the use of photodynamic laser therapy has improved the smell and respiratory function of the nasal mucosa, and it has been proven that the normalization of the level of cytokines in blood serum prolongs the duration of relapses. Thus, a correctly chosen comprehensive approach not only improves the current clinical condition, but also improves the prognosis. This means that the prognostic assessment should answer not only the question "how will the disease proceed?," but also the question "how can its further course be improved?."

From a practical point of view, in patients with a high risk of recurrence of polypoid rhinosinusitis, the following tactical approach is advisable: dynamic monitoring of functional indicators, assessment of the state of biomarkers and cytokines, correction of allergic and respiratory concomitant diseases, application of

comprehensive rehabilitation measures in the postoperative period, and long-term dispensary observation of the patient. This approach helps to identify recurrence in the early stages of the disease and prevent its exacerbation.

Thus, the risk of recurrence in polypoid rhinosinusitis is determined by a number of clinical, functional, immunobiological, and molecular factors. In the dissertation, it has been proven that a decrease in mucociliary transport function worsens the course of the disease, changes in the levels of p53, EGF, VEGF, and VEGFR-2 are factors determining the development and course of the disease, and the normalization of cytokines in blood serum prolongs the duration of relapses. These data confirm the need to form a prognostic assessment of polypoid rhinosinusitis based on a comprehensive approach. Early detection of recurrence factors allows the doctor to classify the patient in the risk group, choose individual treatment tactics, and correctly develop a follow-up plan. Therefore, the assessment of the prognosis in the management of polypoid rhinosinusitis should be considered as an integral part of treatment.

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