



COMPARATIVE EFFECTIVENESS OF STANDARD AND ADVANCED
ENDOSCOPIC METHODS FOR DIAGNOSING LARYNGEAL TUMORS AT THE
OUTPATIENT STAGE

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Abstract: *The importance of early diagnosis at the primary care level cannot be overstated for laryngeal cancer outcomes. Early detection and treatment are key factors in securing long-term remission and potential cure.*

Keywords: *laryngeal tumors, endoscopic diagnosis, early detection, outpatient stage, otorhinolaryngology*

INTRODUCTION

Laryngeal tumors hold a significant place in the structure of head and neck cancers and continue to pose a serious medical and social problem. Despite the visual accessibility of the larynx for examination, early stages of the tumor process often remain undetected at the outpatient stage, which is associated with the similarity of the endoscopic presentation to chronic inflammatory and precancerous conditions.

The outpatient level is a key stage in the early diagnosis of laryngeal tumors, as it is here that the initial clinical and endoscopic conclusion is formed and the need for morphological verification is determined. Traditional white light endoscopy, widely used in outpatient practice, has limited diagnostic capabilities for superficial and initial forms of tumor growth [1, 2].

In recent years, advanced endoscopic imaging methods have been introduced into clinical practice, allowing for more detailed assessment of the epithelial architecture and vascular pattern of the laryngeal mucosa, thereby increasing the detection rate of early neoplastic changes [3–6]. However, a comparative evaluation of their effectiveness in the setting of an outpatient clinic remains insufficiently studied.

Objective: To conduct a comparative evaluation of the effectiveness of standard and advanced endoscopic methods for diagnosing laryngeal tumors at the outpatient stage.

Material and Methods: The study included 83 patients with laryngeal tumors examined at the outpatient stage. All patients were divided into two groups based on the diagnostic approach used.

The main group consisted of 55 patients who underwent endoscopic examination using advanced imaging methods. High-resolution videolaryngoscopy, endoscopic image magnification, and narrow-band imaging modes were employed, allowing for a detailed



assessment of the epithelial condition and features of the mucosal microcirculation in the larynx.

The control group consisted of 28 patients examined using the standard endoscopic technique in white light mode without the use of additional imaging modes. The evaluation of the endoscopic picture was based on the analysis of the shape, size, surface of the pathological focus, the condition of the mucosa, and vocal fold mobility.

Inclusion criteria were the presence of clinical and endoscopic signs of laryngeal tumor involvement with subsequent morphological verification of the diagnosis. Patients with recurrent tumors and those who had undergone prior specific treatment of the larynx were not included in the study.

Final verification of the diagnosis in all cases was based on the results of histological examination of biopsy material, considered the "gold standard" of diagnosis.

The effectiveness of the diagnostic methods was assessed based on sensitivity, specificity, overall diagnostic accuracy, the frequency of detection of early-stage tumor processes (Tis–T1), and the time from the initial examination to morphological verification.

Statistical analysis was performed using standard methods of variation statistics. For comparing qualitative indicators, the χ^2 test or Fisher's exact test was used; for quantitative indicators — the Student's t-test or the Mann-Whitney U test. Differences were considered statistically significant at $p < 0.05$.

Results: Analysis of the obtained data revealed significant differences in the effectiveness of the applied diagnostic approaches.

In the main group, early stages of the tumor process (Tis–T1) were diagnosed in 34 out of 55 patients (61.8%), whereas in the control group, early forms were detected in 9 out of 28 patients (32.1%), indicating a significant advantage of advanced endoscopic methods ($p < 0.05$).

Diagnostic sensitivity in the main group was 90.9%, specificity — 83.6%, and overall diagnostic accuracy — 88.7%. In the control group, these indicators were lower, amounting to 67.9%, 71.4%, and 69.6%, respectively.

The frequency of diagnostic discrepancies between the endoscopic conclusion and histological results was 9.1% in the main group, compared to 28.6% in the control group.

The average time from the initial outpatient examination to morphological verification of the diagnosis was 6.9 ± 1.3 days in the main group and 12.1 ± 2.0 days in the control group ($p < 0.05$).

Discussion: The obtained results demonstrate the high diagnostic value of advanced endoscopic imaging methods when examining patients suspected of having laryngeal tumors at the outpatient stage. The ability to assess epithelial and vascular changes in detail allows for the detection of the tumor process at early stages when traditional white light endoscopy proves insufficiently informative.

Comparison of these data with the results of international studies confirms the feasibility of implementing advanced endoscopic diagnostics into primary ENT (otolaryngology) practice. A distinctive feature of the present work is its focus on the conditions of the outpatient level, which determines its practical orientation.



A limitation of the study is the heterogeneity in group sizes; however, this does not diminish the reliability of the identified differences and reflects real-world clinical practice conditions.

Conclusions:

Standard white light endoscopy has limited sensitivity in diagnosing early forms of laryngeal tumors at the outpatient stage.

The application of advanced endoscopic imaging methods significantly increases the detection rate of early-stage tumor processes.

The use of modern endoscopic technologies contributes to reducing the time to morphological verification and optimizing patient referral pathways.

Implementing advanced endoscopic diagnostics into outpatient practice is an effective direction for improving the quality of early diagnosis of laryngeal tumors.

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