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MODERN METHODS OF DIAGNOSING CHRONIC LARYNGITIS

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ABSTRACT

Timely detection and treatment of chronic hypertrophic laryngitis is of particular importance and is a key link in the prevention of malignant tumors of the larynx. Traditional diagnostic methods do not always allow for a correct assessment of the condition of the larynx in chronic laryngitis and the dynamics of recovery processes during treatment. Therefore, the combined use of modern methods for examining the larynx is of great importance. Based on such a study of 14 men and 6 women aged 20 to 63 years, who were treated for chronic hypertrophic laryngitis, it was shown that videostroboscopy, autofluorescent diagnostics, NBI-endoscopy, and cytological examination of smears from the affected areas of the vocal folds are methods of early diagnosis of chronic hyperplastic laryngitis, which can complement each other not only when making diagnosis difficult, but also when assessing the effectiveness of treatment and rehabilitation measures aimed at restoring the functions of the larynx and preventing the development of tumors. The obtained data made it possible to clarify the nature of hypertrophic changes in the mucous membrane of the vocal folds and reliably interpret the clinical picture of the disease in the examined patients as a manifestation of chronic hyperplastic laryngitis with signs of leukkeratosis and leukoplakia.

KEYWORDS: *Chronic Laryngitis, NBI-Endoscopy, Mountain Videostroboscopy, Autofluorescent Diagnostics, Cytological Examination.*

INTRODUCTION

The problem of chronic inflammatory pathology of the larynx remains relevant due to its wide prevalence and the possibility of malignancy of cells in the zone of inflammation [1-4]. It is known from the scientific literature that 12% of all diseases of the ENT organs are associated with hyperplastic laryngitis, which in 4-5% of cases contributes to the development of laryngeal cancer [4, 6]. Therefore, the timely detection and treatment of this pathology is of particular importance and is a key link in the prevention of malignant formations of the larynx [6-9]. It should be noted that the tumor process can also develop in visually healthy mucous membranes, where invisible changes related to metabolic disorders occur at the cellular level under unfavorable external and internal influences [7, 10]. Traditional diagnostic methods do not always allow for a correct assessment of the state of the larynx in chronic laryngitis and the dynamics of recovery processes during treatment. This situation requires special additional diagnostic tests to determine the pathogenetic mechanisms of disease development [11]. From the point of view of evidence-based medicine, the joint use of several methods of patient examination, including the possibility of morphological confirmation of the diagnosis made using cytology, is currently of great importance.

THE PURPOSE OF THE STUDY

The purpose of the study is to increase the effectiveness of the diagnosis of chronic laryngitis based on the combined use of traditional and modern methods of examining the condition of the larynx.

MATERIALS AND METHODS

Patients were examined for chronic hypertrophic laryngitis in 14 men and 6 women aged 20 to 63 years. A comprehensive examination of all patients included an anamnestic analysis, objective examination of the larynx using endoscopic techniques: videostroboscopy, autofluorescent and NBI-endoscopy, as well as cytological examination of smears from the larynx mucosa. All patients complained of persistent hoarseness of the voice, often discomfort in the throat (biting, scratching, itching, feeling of dryness). The duration of the disease ranged from 1 to 7 years.

RESULTS

When collecting a medical history, it was established that 45% of the examined patients suffered from comorbidities such as hypertension, bronchial asthma, diabetes mellitus, osteochondrosis, chronic rhinitis, while 22% of patients were smokers. Upon clinical examination of patients, it was established that the mucous membrane of the vocal folds is thickened, pink in color, and in some cases has a pronounced papillary pattern. Hypertrophied areas are often located in the anterior and middle thirds of one or two



vocal folds and have a diffuse or limited appearance. In all patients, an asymmetrical decrease in the amplitude of vocal fold vibrations was observed during video stroboscopy. The mucous wave was often absent in areas of keratosis and hypertrophic changes in the epithelium. Non-vibrating sections were also identified. The glottis in 7 patients was in the shape of a sand clock, and in the rest - in an irregular shape. For autofluorescent diagnostics, a video camera and rigid 70° or 90° endoscopes were used, which had blue filters, a D-LIGHT C/AF light source with a short-arc xenon lamp, a medical monitor, and a recording device. All patients underwent examination in two modes: videoendoscopy in white light and autofluorescent diagnostics in blue light. As a result, a general decrease in the intensity of the green signal fluorescence was observed. A white or light green color was characteristic in the areas of keratosis in the form of thickening of the mucous membrane with a rough surface with chalk. This made it possible to clearly define the boundaries, sizes, and prevalence of the pathological process (Fig. 1). In five patients, a local decrease in the intensity of fluorescence of the green signal in the vocal folds from the area of flat-shaped branching with a light blue color, characteristic of leukkeratosis and leukoplakia of the vocal folds, was revealed (Fig. 2).

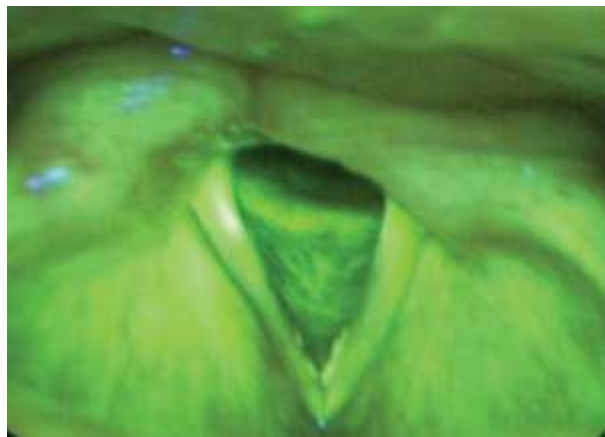


Figure 1. Autofluorescent picture of the larynx in a 63-year-old patient. Diagnosis: chronic hyperplastic laryngitis, vocal fold leukokeratosis

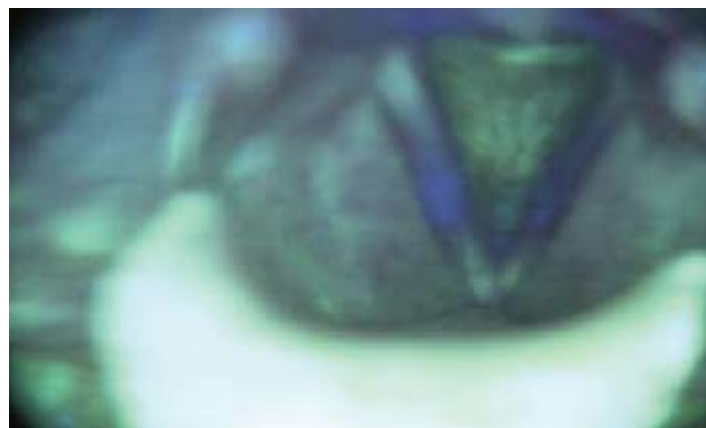


Fig. 2. Autofluorescent picture of the larynx in a 58-year-old patient. Diagnosis: chronic hyperplastic laryngitis, vocal fold leukoplakia.

The peculiarities of autofluorescence in these pathological processes can be explained by the varying degree of keratinization of epithelial cells. These cells produce keratin, which causes them to emit specific light. Blue and green light filters with wavelengths of 415 and 540 nm, respectively, are used in NBI-endoscopy. Narrow striped blue light allows for the identification of superficial vessels, while green light allows for the identification of subepithelial vessels. In NBI mode, the vascular network is clearly visible, unlike standard endoscopy, which allows for the identification of altered areas of the mucous membrane and the identification of a specific vascular system characteristic of tumors with a high degree of vascularization [12-15]. In the examined patients, an endoscopic examination of the larynx was performed in NBI mode, in which a uniform structure of the mucous membrane and vessels was revealed, while the meningeal areas of the vocal folds had clear boundaries without a clear vascular pattern in 18 out of 20 patients. It should be noted that, according to literature data, when using NBI diagnostics, the percentage of detection of "false positive lesions" decreases to 11%, unlike autofluorescent endoscopy (40%) [16, 17]. To determine changes occurring at the cellular level, smears were taken from the larynx from all patients and a cytological study of the material was conducted. In this case, cells located in the epithelial layer of the mucous membrane or lying freely on its surface were applied to the smear-mold. The smears were applied to the slide, air-dried, and placed in a Mai-Grünwald dye fixator for 3 minutes. After this, the windows were washed from the back with running water, and the smears were stained to the end using the Romanovsky method for 10-15 minutes. The



obtained preparations were dried again and transferred under a microscope. When studying smears taken from the mucous membrane of the vocal folds, the data of cytological analysis in all cases corresponded to the picture characteristic of chronic hyperplastic laryngitis. In the preparations, numerous layers of stratified squamous epithelial cells were found in its various layers. This indicates increased proliferation of both surface and basal epithelial cells. Most cells of the surface layer had signs of keratinization. Some of them were distinguished by enlarged size, clarified cytoplasm without clear contours, hypertrophy of the nuclei, while others had dense granular cytoplasm and a hyperchromatic rod-shaped nucleus. Binuclear cells, "shell" cells, as well as cylindrical epithelial cells of curved shape, often devoid of cilia, were encountered. From other cellular structures, chronic inflammatory elements - lymphocytes, neutrophilic leukocytes - were present in the field of view. The background of the preparations was protein, mucous strips, and sometimes microbial flora (Fig. 3).

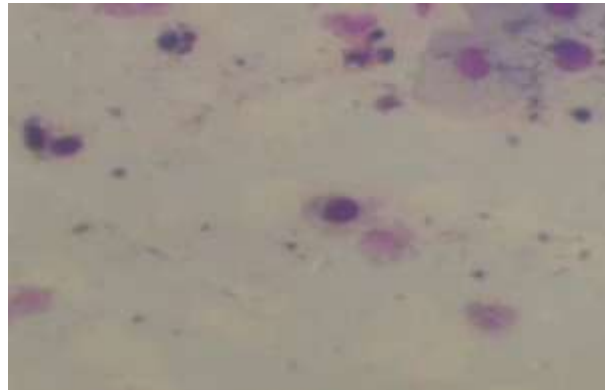


Figure 3. Degenerative-dystrophic changes in the epithelium of the laryngeal mucosa in a patient with chronic hyperplastic laryngitis. Printed laryngeal ointment. Stained with azure and eosin. Volume. 40, approx. 10.

The obtained data allowed for a reliable interpretation of the clinical picture of the disease in the examined patients as a manifestation of chronic hyperplastic laryngitis with signs of leukkeratosis and leukoplakia, as well as the choice of the most effective treatment method. In the classification literature, pathological processes in the larynx identified at the diagnostic stage are included in the group of dyskeratosis, and in the International Classification of Diseases, they are included in a special rubric (J 38.3), which requires special treatment. On this basis, all patients underwent surgery at the VMedA clinic. The surgical intervention consisted of radical endolaryngeal removal of laryngeal tumors using the "Atkus-15" surgical semiconductor laser and the Lumenis AcuPulse IV generation CO2 laser. During the operation, modern film-forming coatings were used to treat the wound surfaces, which, according to the literature, significantly reduces postoperative reactive states and positively affects the final treatment outcome [18]. Histological examination of the surgical material confirmed the diagnosis and completely excluded the presence of cancer in situ.

CONCLUSIONS

The combined use of videostroboscopy, autofluorescent diagnostics, endoscopy of the NBI, and cytological examination of smears from the affected areas of the vocal folds allows for early diagnosis of chronic hyperplastic laryngitis, taking into account morphological data confirming the diagnosis at the structural level. The listed methods can complement each other not only in the diagnosis and selection of the appropriate treatment method, but also in assessing the effectiveness of treatment and rehabilitation measures aimed at restoring the functions of the larynx and preventing tumor processes.

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