

PROCEEDINGS

LARYNGOSTROBOSCOPIC EXAMINATION OF VOICE CHARACTERISTICS IN PATIENTS BEFORE AND AFTER DENTAL TREATMENT

Miroslav Stoykov, Gergana Georgieva, Mario Milkov

*Department of Dental Material Science and Propaedeutics of Prosthetic Dental Medicine,
Faculty of Dental Medicine, Medical University of Varna*

ABSTRACT

The progress of modern medicine and the widespread introduction of new technologies in the treatment process requires health professionals to be informed about the opportunities offered by science to improve the results of procedures. For the first time Topler and Ortel, in the period 1866–1878, applied the stroboscopic effect to decompose the motion of fast-moving objects. It is known that the image we get in phonation is collective due to the peculiarities of the retina and vocal apparatus. The stroboscopic effect is based on the use of a high-frequency pulse lamp, which allows the illumination of the rapid movements of the vocal cords up to 5 times per second, by interrupting the light source. Thus, the actual phonatory oscillations of the vocal folds are replaced by delayed, observable visual perceptions, possessing properties of the real movements. When the patient is asked to sing a vocal, the energy of the sound is converted into light. The pulse lamp starts to light up and goes out with the frequency of oscillation of the vocal cords. The stroboscopic indicators that can be evaluated are: frequency of movement of the vocal cords, amplitude of oscillations, course of movement, etc. Laryngostroboscopy is used to assess vocal abilities for the diagnosis and differential diagnosis of functional dysphonia, and the diagnosis of processes associated with infiltration of a pathological process in the vocal muscle. In recent years, high-magnification laryngostroboscopes have been used. They allow better magnification and visibility, as well as video recording of the image.

The prosthetic base is an important element in the construction of prosthetic structures. It not only provides stability to the prosthesis, but also affects the speech function. The relevance and importance of scientific issues for the study of voice capabilities in dental prosthetics are due to the fact that, in recent years, dental medicine has undergone a number of changes related to the evolution of technologies and methods for manufacturing dentures and materials that are used in the process. The aim is to synthesize a structure that, on the one hand, is strong enough not to fracture during mastication and thin enough not to affect the patient's speech function. This means that dental professionals need to develop their skills to work with new and innovative technologies.

Keywords: *laryngostroboscope, voice characteristics, dental treatment*

Address for correspondence:

Mario Milkov
Faculty of Dental Medicine
Medical University of Varna
84 Tzar Osvoboditel Blvd
9002 Varna, Bulgaria
email: mario.milkov@gmail.com

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INTRODUCTION

The progress of modern medicine and the widespread introduction of new technologies in the treatment process requires health professionals to be informed about the opportunities offered by science to improve the results of procedures. For the first time Topler and Ortel, in the period 1866–1878, applied the stroboscopic effect to decompose the motion of

fast-moving objects. It is known that the image we get in phonation is collective due to the peculiarities of the retina and vocal apparatus. The stroboscopic effect is based on the use of a high-frequency pulse lamp, which allows the illumination of the rapid movements of the vocal cords up to 5 times per second by interrupting the light source. Thus, the actual phonatory oscillations of the vocal folds are replaced by delayed, observable visual perceptions, possessing properties of the real movements. When the patient is asked to sing a vocal, the energy of the sound is converted into light. The pulse lamp starts to light up and goes out with the frequency of oscillation of the vocal cords. The stroboscopic indicators that can be evaluated are: frequency of movement of the vocal cords, amplitude of oscillations, course of movement, etc. Laryngostroboscopy is used to assess vocal abilities, for the diagnosis and differential diagnosis of functional dysphonia, diagnosis of processes associated with infiltration of a pathological process in the vocal muscle. In recent years, high-magnification laryngostroboscopes have been used. They allow better magnification and visibility, as well as video recording of the image.

AIM

The aim of the present study was to determine how dental treatment affects the characteristics and quality of speech.

MATERIALS AND METHODS

For the period March 2022–August 2022, in the available database (PubMed, BioMed Central, ScienceDirect, Scopus, Web of Science, Embase), a systematic analysis of scientific publications investigating the role laryngostroboscopic examination of voice characteristics in patients before and after dental treatment was conducted.

RESULTS

The prosthetic base is an important element in the construction of prosthetic structures. It not only provides stability to the prosthesis, but also affects the speech function (1,2). The base of the prosthesis changes the articulatory areas of the phonemes in the oral cavity and can disrupt the movements of the tongue. In this regard, it is necessary to make prosthetic structures that are as thin as possible for the proper formation of phonemes and speech

intelligibility. The connecting elements of the partial removable prostheses must be located in the phonetically neutral zone. Buccal and lingual forms of the teeth are also important for the articulating process (3,4). The relevance and importance of scientific issues for the study of voice capabilities in dental prosthetics are due to the fact that, in recent years, dental medicine has undergone a number of changes related to the evolution of technologies and methods for manufacturing dentures and materials that are used in the process. The aim is to synthesize a structure that, on the one hand, is strong enough not to fracture during masticatory function and thin enough not to affect the patient's speech function (5) This means that dental professionals need to develop their skills to work with new and innovative technologies.

For many years, the gold standard in voice function research, both for prevention and for the detection of benign and malignant diseases in the pharynx and larynx, has been the laryngostroboscope (6). It allows both a classic view of the vocal cords through laryngoscopy, as well as a view and recording of the movements of the vocal cords through the emission of interrupted light to diagnose existing pathology in them (7). Modern installations also allow recording of speech with a microphone and subsequent analysis to identify deviations from the norm. The device allows voice analysis and establishing whether the problem is rooted in the vocal cords or is due to the dental prosthesis construction. Potentially, whether and how dental prosthetic treatment affects articulation can be established.

Emphasis should also be placed on the serious prevalence of malignant processes in the oral cavity, pharynx and larynx, given the fact that smoking is widespread as a harmful habit and addiction, the possibility and importance of early diagnosis through targeted examinations (8).

Laryngostroboscopy examination of voice characteristics in patients before and after dental treatment includes: receiving detailed history of the patient's complaints, current and past diseases, hereditary diseases in the family. Otorhinolaryngologic examination to establish or rule out pathology in the larynx by the method of

laryngostroboscopy and other methods is important (9). Dental examination to establish dental and oral status, type of bite, presence of bad habits (bruxism, biting of the buccal mucosa, tongue, objects, etc.), presence of pathology in the temporomandibular joints (TMJ), etc. by a dentist is needed. Utilizing relevant imaging diagnostics and complete speech therapy examination and examination by a speech therapist for ruling out a speech condition are part of the process (10,11).

CONCLUSION

Modern laryngostroboscopy is becoming more common in the practice of specialists in the field due to the possibility of viewing the hard-to-reach areas of the larynx and early diagnosis of benign and malignant neoplasms. Another advantage is the assessment of the qualities and characteristics of speech as it helps to distinguish phonation from articulatory disorders of sound. After prosthetic dental treatment, restoring the natural anatomy and occlusal relief of the teeth, with the help of a microphone to the equipment can help analyze the impact it has on the pronunciation of sounds. The results are expected to confirm the connection between the changes in the patient's dental status and articulation disorders and the positive effect of the performed prosthetic dental treatment.

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