

Atlas of Strobolaryngoscopy

Laryngeal Disorders

Wen Xu



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Preface

With the acceleration of modern social process, the increase of various stimulation factors, and the quickening of people's living rhythm, the incidence of pharyngolaryngeal diseases has increased significantly. The physiological functions of larynx and pharynx are complex and important, including phonation, respiration, swallowing, and immune defense. Due to the deep location of the pharynx and larynx, endoscopic observation is often required. Endoscopic examination is the basis for making diagnosis of pharyngolaryngeal diseases, including indirect laryngoscopy, flexible laryngoscopy, electrolaryngoscopy, strobolaryngoscopy, narrow-band imaging endoscopy, and direct laryngoscopy. It is known to all that vocal fold vibration is the basis of phonation. However, regular laryngoscopy is unable to inspect the high-speed vibration of vocal fold during phonation. Besides the observation of laryngeal and hypopharyngeal structure and lesions, the greatest advantage of strobolaryngoscopy is the ability to acquire multiple information of vocal fold vibratory features through inspecting the high-speed vocal fold vibration in "slow motion," which makes strobolaryngoscopy able to evaluate the anatomical and functional characteristics. Strobolaryngoscopy provides new diagnostic and research methods for normal and abnormal voice function assessment. Strobolaryngoscopy also plays an important role in clinical voice function assessment and diagnosis of voice disorders. Strobolaryngoscopy has been widely used in clinical diagnosis of pharyngolaryngeal diseases and has become an essential examination for the assessment of voice disorders. However, due to the lack of specialized knowledge and operational skills, doctors in many countries have not yet fully mastered the interpretation of strobolaryngoscopic results. It is necessary to deepen the understanding of strobolaryngoscopy in many hospitals.

This book is dedicated to the deep interpretation of strobolaryngoscopy. The book is presented into two parts: the first part is the overview of the strobolaryngoscopy, and the second part focuses on the strobolaryngoscopic signs of common pharyngolaryngeal diseases. The former contains the principles, equipments, parameter setup, operational procedures and tips, observation parameters, and precautions of strobolaryngoscopy. The latter covers strobolaryngoscopic signs and diagnostic key points of over 30 kinds of those common pharyngolaryngeal diseases, together with the corresponding strobolaryngoscopic videos.

In this book, there are over 300 high-resolution strobolaryngoscopic images of various kinds of pharyngolaryngeal disease. They are all from carefully selected representative cases. The corresponding captions are concise and comprehensive, which cover the medical history and detailed description of strobolaryngoscopic signs. Another feature of this book is that there are 18 strobolaryngoscopic videos included in the book. The readers can watch the dynamic strobolaryngoscopic videos simply by scanning the QR code. This allows readers to observe the vibratory characteristics of vocal folds and grasp the diagnostic key points of strobolaryngoscopy.

I wish this book would provide a refined and practicable reference about strobolaryngoscopy and interpretation of pharyngolaryngeal diseases for young doctors, primary care physicians, and graduate students of otolaryngology.

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Part I

**Laryngopharyngeal Endoscopy:
An Overview**



Since the pharynx and the larynx are complex anatomic structures and carry out important physiological functions, which include articulation, breathing, swallowing and immunity responses. The structures are deep and specialized equipment is needed for inspection. Visual examination of the larynx is an important clinical investigation. Endoscopic examination of larynx includes indirect laryngoscopy, flexible fiberoptic laryngoscopy, electronic laryngoscopy, narrow band imaging (NBI) endoscopy, and strobolarngoscopy. These instruments are useful for observing the configuration of pharyngolaryngeal anatomy and pathological conditions. The high-speed vibratory margin of the vocal folds may be further assessed using strobolarngoscopy, high-speed photography, high-speed video laryngoscopy, videokymography, electroglottography or photoglottography.

1.1 Indirect Laryngoscopy

Indirect laryngoscopy is the basic traditional pharyngeal and laryngeal examination procedure. During the examination, a hand-held reflective mirror is placed inside the oral cavity and the back surface of the mirror is used to elevate the soft palate. The indirect laryngeal mirror provides a view of the laryngeal and hypopharyngeal structures. Indirect laryngoscopy is only considered as a screening procedure of the hypolarynx

and larynx in modern laryngoscopy. Flexible laryngoscopy, strobolarngoscopy, or direct laryngoscopy may be used as a better examination of this area when the result of indirect laryngoscope is not satisfactory.

1.2 Flexible Laryngoscopy and Electrolaryngoscopy

Flexible laryngoscope and electrolaryngoscope are common tools used to examine patients with nasal, pharyngeal, or laryngeal disorders. Optical fiber has the advantage of being flexible with high illumination power so that it can be guided to any direction. The end of flexible laryngoscope and electrolaryngoscope can approach the tissue surface for direct observation. By using flexible laryngoscope, one can observe not only the laryngeal lesions, but also the changes of the vocal tract in relationship to articulation, swallowing, and respiration in a more natural state. This inspection is conducive to a more complex dynamic voice assessment.

During the examination, the patient could sit up or lie down supinely. Topical anesthesia spray may be applied to the nostril, the pharynx, and the larynx if needed. The flexible laryngoscope is inserted into the patient's nostril and passed transnasally under direct visual guide into the oropharynx, hypopharynx and then the larynx. Flexible laryngoscope allows visualization of