**History of Videostroboscopy**

**What is Videostroboscopy?**

There are several diagnostic modalities to view the larynx, including indirect laryngoscopy using a mirror and direct laryngoscopy with the help of either a flexible endoscope or a rigid endoscope. Videostroboscopy is a diagnostic technique designed specifically to observe the vibration of vocal cords/vocal folds. The actual vibration of vocal cords is so fast that the unaided eye cannot observe it unless a slow-motion picture is generated.

The principle of videstroboscopy is to produce a slow-motion picture of the vocal cords vibration so that each vocal cord's vibration properties during the different phases of the vibration cycle can be perceived.

**How Videostroboscopy Evolved:**

The concept of videostroboscopy was presented long ago when stroboscopic images were generated using a flashing light source. Earlier in the 19th century, a Viennese scientist named Stampfer developed a rotating device to observe apparent motion and called it "stroboscope." All the pulsatile light-generating devices for observing motion come under this terminology.

The idea of examination of the larynx using stroboscopic light was, although conceived in [1874 by Oertal](https://entokey.com/the-history-of-laryngeal-imaging/#c001_r074), it did not receive much recognition until the introduction of electricity in 1895. The device introduced by Oertal consisted of a perforated wheel that interrupted the light used to illuminate the vocal folds so that the vocal fold vibration could be appreciated. His device did not receive much recognition from the scientific community because of the limitations in illumination, imprecise control of the flashing frequency, and poor image quality.

**Modern Strobolaryngoscopy:**

The pioneers of modern strobolaryngoscopy are Dr. J.W. van den Berg, Dr. Rolf Timke, Dr. Hans von Leden, and Dr. Elimar from the University of Groningen, the University of Hamburg, the University of California, and Erlanger, respectively. They have written the first definitive book on stroboscopic examination of the larynx in 1960. Many principles of modern stroboscopic devices are based on the early to mid-1900s innovations in the usage of stroboscopic light for producing still images of moving objects. Plateau, a scientist, suggested that an intermittent flash can be used to illuminate moving objects to produce a stationary image, and H.E. Edgerton developed gas discharge tubes for stroboscopy using an oscillator that controls the frequency of the discharge and the rate of flashing.

The *Talbot’s law* defines that images linger in front of the retina for 0.2 seconds after exposure; therefore, to produce the illusion of a continuous image, sequential images (representing an object in motion) at the interval of fewer than 0.2 seconds are needed. Another concept is correspondence, in which analysis of a corresponding portion of sequential images produces an illusion of motion on the representation of still images.

A characteristic of the visual system is that it permits the interpretation of a series of slightly-altered still images by filling in the gaps between frames and present it as a continuous image. Based on all these laws, and improvements in audio and video recording technologies, and subsequent innovation in optical image resolution and fiberoptic light-source intensity, modern video stroboscopic unit produces a sharp, brightly illuminated and magnified image of vibrating vocal cords.

**How Does It Work?**

In strobolaryngoscope, intermittent light flashes depending upon the frequency of vocal cord vibration are thrown on vocal cords. This produces a clear, still image of each vibratory cycle. If the frequency of flashes is less than the vibration frequency of the vocal fold, it results in a delay in the portion of each vibratory cycle illuminated, producing an illusion of slow motion. Healthy vocal cords don't produce periodic vibratory motion. Thus, the pattern viewed by strabolaryngoscope is an average of many successive nonidentical vibratory cycles and is not truly a detailed demonstration of the individual cycle.

**References:**

1. Stroboscopy: Overview, Background and Surgical Principle .... <https://emedicine.medscape.com/article/866178-overview>
2. The history of laryngeal imaging.

<https://entokey.com/the-history-of-laryngeal-imaging/#c001_r074>