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بعض الوثائق الأصلية تالفه

Descriptive study of the stroboscopic findings in male smokers versus normal subjects in patients attending the E.N.T outpatient clinic of seuz canal university hospital

A Thesis submitted for partial fulfillment

of the Master Degree in Otorhinolaryngology

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Introduction

Examination of the larynx consists of indirect mirror examination and auditory perceptual judgement of voice. Since these perceptual measures don't yield permanent records of laryngeal image and provide only indirect information about vocal fold vibration, they don't yield adequate description of laryngeal function and may lead to inappropriate management decisions.

Stroboscopic examination, as a routine clinical test, is the most practical technique for examination of the vibratory pattern of the vocal folds *(Diane M., 1996).*

Stroboscope was discovered by Plateau in 1872 and was introduced in laryngology in 1878 by Oertel and introduced in Egypt by *Khuadry et al., 1968.*

Schonnari 1960 made extensive investigation on modern stroboscope since then stroboscopic examination has become popular in voice clinic.

Stroboscope is based on the optical illusion that arises from persistence of vision. Every light impression on the retina leaves a positive picture of 0.2-second duration, and so a sequence of single pictures presented with an interval of less than 0.2 second will give the impression of continuous movement.

In order to make the fast movement of the vocal fold visible, flashes of light are used, this allows the visualization of single phase of the vibratory cycle provided that the duration of the flashes are small in comparison to the duration of the vibratory cycle *(Shonnari, 1980).*

If the flashes of the light are in the same frequency as that of the vocal cords vibration, this will illuminate the same phase of each vibratory cycle, and the vocal cords will appear to be standstill. When a time shift factor is interposed between the patients triggering frequency of phonation and the frequency of flashes of light, a successively shifting phase of each vibratory cycle will be illuminated *(Alberti PW, 1978).*

The eye will perceive these successive shifting phases of many cycles as phases of one cycle occurring at a much slower rate than the actual rapid vibration of the vocal folds.

Stroboscope dose not shows the fine details of each vibratory cycle but it demonstrate vibratory pattern averaged over many cycles *(Shonnari, 1980).*

When the stroboscopic system is coupled to videotape recording system, it becomes the only clinically practical technique for direct observation of the vocal folds. It permits the creation of permanent records that can be measured, analyzed and observed many times while the patient is examined only one time by non-invasive, cheap, easily done outpatient technique of examination. Also, many examiners and staff members for judgment and consultation about the absence or the presence of certain pathology can assess the permanent records *(Sessions, 1992).*

Hirano, 1992 had stated Stroboscopic-rating system includes assessment of the fundamental frequency, symmetry of bilateral movement, regularity of successive vibration, glottal closure, amplitude, mucosal wave, non-vibrating portion and other parameters. New scale has been developed for stroboscopic assessment of voice with more discrete rating that comprises 10 items put on a 6-points scale except the pattern of glottal closure which is on a 7- points scale *(Suny Health Center, 1995).*

More over, the stroboscope was shown to be an excellent clinical tool to observe details of the epithelium and underlying structure during phonation, *(Ketzing P., 1985).*

Tobacco use has been found to be a major risk factor for the development of laryngeal cancer in numerous studies and all studies indicate that the risk increases with increasing the amount of smoking *(DE Stefani, 1987).*

Aurbach, et al, 1970 in a study of postmortem larynges found epithelial changes into laryngeal & vocal mucosa of about 6% in non smokers, 22% in 20 cigarette/day smokers, 44% of 40 cigarette/day smokers and they report the presence of cellular atypia in 85% of heavy smokers.

Therefore it would be valuable to use the stroboscope coupled to videotape recording system to study and compare the stroboscopic findings in adult male smokers and compare them to the normal stroboscopic findings of normal non-smokers.

Aim of the work

To describe the stroboscopic findings in male smokers in patients attending the Suez Canal University Hospital Otorhino-laryngology outpatient clinic, and to compare them to non-smokers of matched age group.

Anatomy of the Vocal Fold

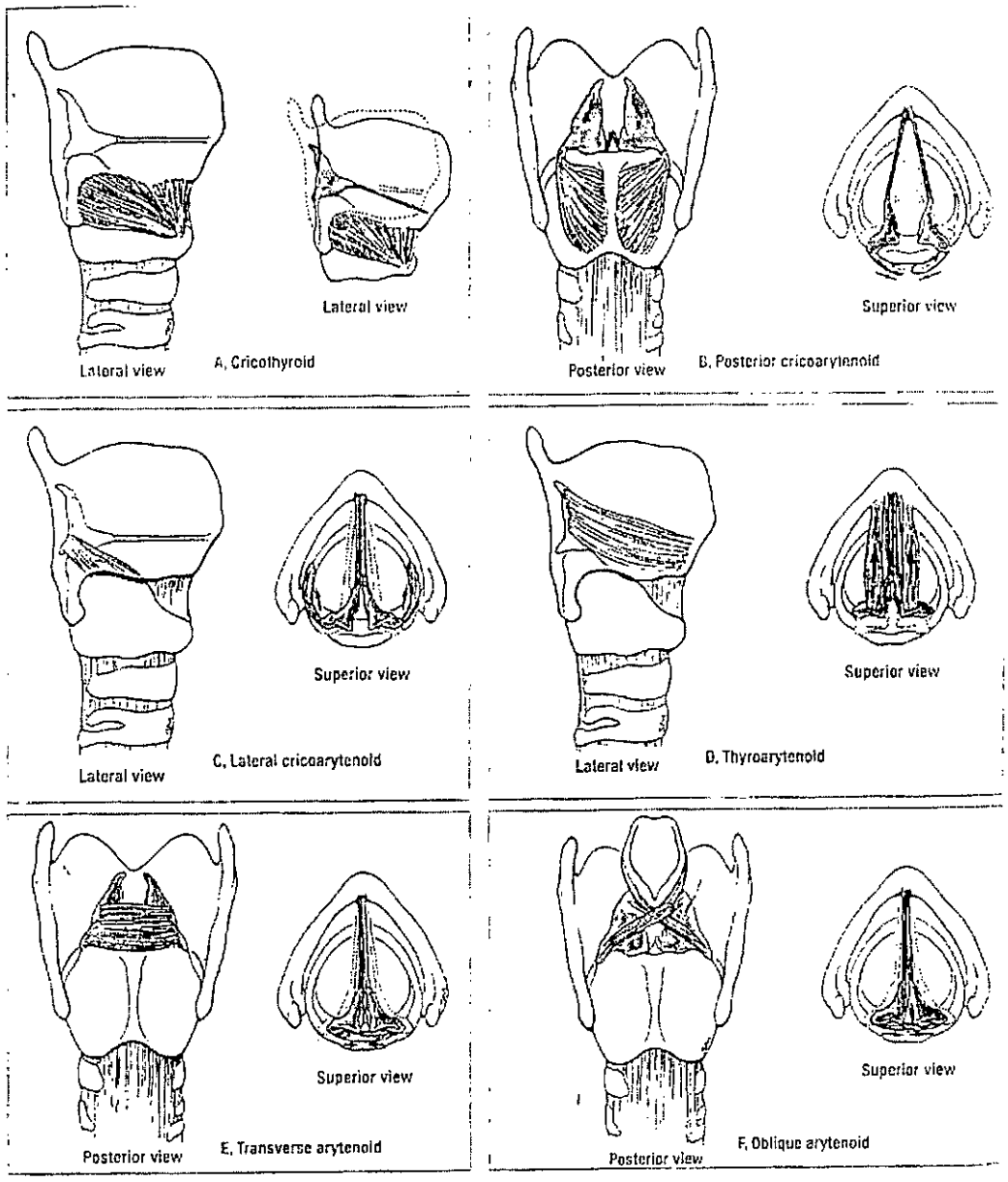
The vocal folds are defined as two fold-like structures, which extend from the angle of the thyroid cartilage to the vocal process of the arytenoid cartilage. The vocal folds and the slit between them (rima glottides) constitute the glottis which is divided by an imaginary line that runs horizontally between the tips of the vocal processes of the arytenoid into an anterior intermembranous portion and a posterior intercartilagenuos portion. The ratio of the anterior \ posterior portion is 3\2, however the ratio of cross-sectional area is 2\3, and this is because of the rectangular shape of the inter-cartilaginous portion *(Neil Wier, 1997).*

The average length of the glottis is 23mm in males versus 16-17mm in females, in the resting state the vocal processes are usually 8 mm apart.

Anatomy of The Muscles Acting on The Vocal Folds:

Muscles of the larynx are classified into extrinsic and intrinsic. The extrinsic muscles are those muscles of the laryngo-hyoid complex that serve to rise, lower, or stabilize the larynx, while the intrinsic muscles are those muscles that modify the size of the glottic opening along with the tension and length of the vocal folds figure (1).

Figure (1): Demonstrates the laryngeal muscles and their action:



Cricothyroid muscle:

The crico-thyroid muscle is located on the external surface of the laryngeal cartilage; it is classically described as consisting of two bellies.

The straight portion or pars recta attaches from the lateral portion of the anterior arch of the cricoid to the inferior border of the thyroid cartilage. The second belly, the pars obliqua, also attaches from the antero-lateral border of the cricoid arch but travels obliquely upward to insert on the anterior portion of the inferior cornu of the thyroid cartilage.

When the right and left cricothyriod muscles contract they rotate the cricoid at the cricothyriod joint; this action brings the anterior arch of the cricoid superiorly toward the inferior border of the thyroid laminae while displacing the posterior cricoid lamina (and the arytenoid cartilage's) inferiorly. This inferior displacement increases the distance between the vocal processes and the anterior commissure. The result of this action is to lower, stretch, and thin the vocal folds while bringing them into a paramedian position. Stretching of the vocal folds also sharpens their edge.

Posterior crico-arytenoid muscle:

This muscle is the sole abductor of the vocal folds. It is seated in a depression on the posterior surface of the cricoid lamina, and its fibers run obliquely superior and lateral to attach onto the muscular process of the arytenoid cartilage. Contraction of this muscle brings the muscular processes medially, posteriorly, and inferiorly while laterally rotating & elevating the vocal processes. This action abducts, elongates, and thins the vocal folds while causing the vocal folds edges to be rounded.

Lateral crico-arytenoid muscle:

This muscle is the main antagonist of the posterior cricoarytenoid muscle. It attaches along the superior border of the cricoid cartilage and then sends its fibers posteriorly to insert on the anterior portion of the muscular process of the arytenoid cartilage. Contraction of this muscle brings the muscular process anterio-laterally while adducting & lowering the vocal process. This results in adduction, elongation, and thining of the vocal folds. The edges of the vocal folds become sharper, and their component layers are passively stiffened.

Interarytenoid / Aryepiglottic muscle:

The interarytenoid is the only unpaired intrinsic muscle, consisting of two types of muscle fibers.

The bulk of the muscle consists of transverse fibers passing from the posterior surface of one arytenoid cartilage to the posterior surface of the other. This muscle contracts to bring together the arytenoids, thus assisting in closing the glottis. This dose not affect the mechanical properties of the vocal folds.

Along with these transverse fibers there are oblique fibers which pass from the posterior portion of the arytenoid on one side to the apex of the other side, thus crossing in the midline. Some fibers insert at the apex, whereas others travel along the quadrangular membrane. These fibers contract to narrow the laryngeal aditus. These fibers which travel along the quadrangular membrane are called the aryepiglottic muscle.