

195 - CAVITIES OF THE LARYNX - REVIEW AND UPDATE

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1. INTRODUCTION

The precise knowledge of anatomical structures is a precondition for basic examinations and surgical interventions. So, progress in the field of surgery requires constant exploration of human anatomy, through new studies, in which new techniques are based (Sittel & Eckel, 1995).

In laryngologist, endoscopists and surgeons can improve their diagnostic and techniques making it more familiar this particular area of anatomy. Therefore, the anatomical description of the larynx can increase the general understanding of their morph physiology. (Merati & Rieder, 2003).

In the latest decades, due to advances in structural studies of the larynx, using dissection and advanced image techniques (Sennes et al, 2000; Merati & Rieder, 2003; Morgado, 2005), knowledge was increased and the number of surgical procedures on the laryngeal framework (Ximenes et al, 2003; Morgado, 2005). These recent publications and even the more traditional anatomy books, do not adopt a consistence terminology and concepts regarding the cavity of the larynx, which ends up causing confusion and conflict between authors.

Therefore, the present study aimed to review literature and contemporary scholarly concepts and terminology, maximizing the quantity and quality of information about the cavity of the larynx. Redefining didactically and organizing the nomenclature and the grounds was intended to compare and complete the different settings, minimizing the conflict between authors.

2. GENERAL

To Meratti & Rieder (2003) larynx is a complex neuromuscular structure located in the diversion of the digestive and respiratory systems. It consists of cartilage joined together by ligaments and moved by several muscles. It is continuous with the bottom of the anterior wall of the pharynx and is covered by the mucosa lining the cavity (Gray, 1988). It is vertically located in the midline of the neck, in front of the fourth to the sixth cervical vertebrae, reaching superiorly in women (Grabowsky & Tortora, 2002). Topographically, it is considered part of the infra-hyoid (Lopes, 2004). The larynx is wide superiorly, with the form of a triangular box. Postero-laterally is flat and above is divided by a prominent vertical ridge, and narrow and cylindrical, inferiorly.

According to Gray (1988) and Vergara (2002) the measures that are best found in the larynx of the adult are as follows:

Parameter	Men (mm)	Women (mm)
Height	44	36
Transverse diameter	43	41
antero-posterior diameter	36	26
Circumference	136	112

However, morphometric studies related measures of the larynx with a body mass, height, age and sex of the individual (Eckel & Sittel, 1995).

The cavity of the larynx - cavum laryngis - extends the addition of the larynx (laryngeal opening) to the bottom of the cartilage (Snell, 1995), communicating, respectively, with the hypopharynx and the trachea (Gardner et al, 1975, Gray, 1988).

Previously, the addition of the larynx is limited by the upper edge of the epiglottis. Dorsally, the apex of arytenoid cartilage, cartilage and notch corniculos interarytenoid (Gray, 1988). It is limited laterally by a fold of mucous membrane (including ligaments and muscle fibers), extended between the edge of the epiglottis and the apex of the cartilage, called aryepiglottic (Gray, 1988, Gardner et al, 1975). Laterally, the addition is related to the piriform Laryngopharyngeal (Gardner et al, 1975).

3. DIVISION OF THE CAVITY OF THE LARYNX

Vestibular folds (ventricular) and the vocal divide the cavity of the larynx in three segments:

1. The upper or vestibule (Basmajian, 1993; Latarjet & Liard, 1993; Snell, 1995) or supraglottic region (Gardner et al, 1975; Testut & Latarjet, 1985; Latarjet & Liard, 1993 and Sennes et al, 1998);

2. The middle part (Basmajian, 1993; Latarjet & Liard, 1993 and Snell, 1995), or the glottis (Testut & Latarjet, 1985; Latarjet & Liard, 1993 and Sennes et al, 1998);

3. The bottom cavity or stoma (Basmajian, 1975; Latarjet & Liard, 1993 and Snell, 1995) or infraglottic (subglottic) (Testut & Latarjet, 1985; Latarjet & Liard, 1993 and Sennes et al, 1998).

4. To Merati & Rieder (2003) Endoscopic anatomy of the larynx can be divided into supraglottic, glottic and subglottic.

3.1 Supraglottic Region

Llorca et al (1967) considers that the vestibule of the larynx is the supraglottic region, stretching from the ads in vestibular rhyme. The term comes from the Latin vestibulum, which means any cavity that serves as input to another. Limited, previously at the back of the epiglottis, and wider superiorly (Didio, 2002)

Laterally confined by the vocal folds containing the aryepiglottic muscle, then the cartilages and interarytenoid fold of mucous membrane containing the transverse arytenoid muscle (Snell, 1995) and below the VF. The dimensions of the wall of the supraglottic decrease towards the anterior-posterior (Latarjet & Liard, 1993)

The lobby is narrowed and limited by the inferior vestibular folds (plicae arhythmias) that are designed freeboards pink medially (Snell, 1995; Duilio & Rieder, 2003). The vestibular folds (false vocal folds) are composed of the vestibular ligament extended from the thyroid cartilage. These ligaments are the bottom of the quadrangular membrane - thickening of the lamina propria of the mucosa of the larynx. (Snell, 1995; Llorca, 1967). Basmajian (1993) defines rhyme as the vestibular space present between the vestibular folds and 5mm distal of the rim of the glottis. Some authors include the vestibular folds glottic larynx (Latarjet & Testut, 1985; Latarjet & Liard, 1993), but as a matter of semantics and affinity terms will include the vestibular fold in the vestibule of the larynx.

3.2 Glottic region

The glottis (middle part) of the larynx extends from rhyme to rhyme vestibular fold and includes the structures: the laryngeal ventricle (ventriculus laryngis) and folds (plicae vocalis) (Rouviere, 1959, Gray, 1962).

According to Gray (1988) the ventricle of the larynx is a fusiform fossa, bounded by the free edge of the vestibular fold, the margin of the vocal line and the mucosa covering the corresponding thyroarytenoid muscle. The front of the ventricle leads to a narrow opening, a grant from the membrane, blind pouch of variable size, called the appendix of the ventricle. The ventricles of the larynx separates the vestibular folds of the glottis (Duilio & Rieder, 2003).

Glottis - glottis is in the form of tongue - is the device that includes voice together the vocal folds and the vocal process of arytenoid cartilage and the interval between them. (Gardner et al, 1975; Basmajian, 1993; Didio, 2002, Moore & Daley, 2001 and

Zorzetto, 2003). Some authors consider the glottis and the portion of the middle part of the larynx between the vocal cords, which for others is called the rima glottis (Laterjet & Testut, 1985, Moore & Daley, 2001; Spence, 1991 and Freitas, 2004).

The two folds that form the glottis, are shields musculomembranáceos mobile, white-pearl, located below the VF. Extend from the angle of the thyroid cartilage, previously, to the vocal process of arytenoid cartilage, posteriorly. (Gardner et al, 1975; Gray, 1988)

Each contains the vocal ligament, which consists of elastic tissue derived from the elastic cone, the anatomical structure of the infraglottic. The vocal muscles, which are a part of the thyroarytenoid muscle, form the body of the vocal fold (Gardner et al, 1975). The vocal fold has three sides: top, middle and stoma (Duilio & Rieder, 2003).

Among the vocal folds and vocal processes of the larynx in an opening or gap, narrow and triangular, called Rima glottis - rhyme: crack, crack - (Gardner et al, 1975; Basmajian, 1993; Didio, 2002; Freitas, 2004, Moore & Daley, 2001, Gray, 1988 and Snell, 1995). The rhyme of the glottis is the narrowest part of the cavity of the larynx and its level corresponds to the bases of the arytenoid cartilages (Gray, 1988).

The rhyme of the glottis is subdivided into a front, bigger - or the inter-vocal - which measures about 3/5 (three fifths) of the total extent of opening and a rear, lower - respiratory or intercartilaginous (Gray, 1988 and Didio, 2002).

The amplitude and shape of the rhyme of the glottis varies with the movements of the vocal cords and arytenoid cartilages during respiration and phonation. Under resting conditions, as in quiet breathing, to the intermembranácea is triangular, with the apex to the base front and back. She is represented by a line of about 8mm in length joining the extremes of previous vocal processes. The medial aspect of the arytenoid cartilages are parallel to each other, and therefore intercartilaginous portion is rectangular. Through rima glottis the vocal control the passage of air to produce sounds and voice.

These vary depending on the height and sex of individuals (Senn et al, 2000). At rest the rhyme of the glottis is 2.5 cm long in men and 2 cm in women (Didio, 2002). During the maximum abduction of the vocal folds, such as the issuance of a high note, to the intermembranácea is reduced to a linear slit by apposition of the vocal folds, while the intercartilaginous is triangular. Conversely, in extreme abduction of the vocal folds, as in forced inspiration, the arytenoid cartilages and vocal processes are run laterally and inter presents with triangular shape, but with the apex directed backwards. In this condition, the glottis together is presented in a somewhat diamond with the widest part of the opening corresponding to the insertions of the vocal folds in the vocal processes.

3.3 INFRAGLOTTIC REGION

The stoma cavity is the lower portion of the laryngeal cavity, below the glottis, and extends from the rim of the glottis to the trachea, inferiorly. It is limited by the cricoarytenoid ligament and the inner surface of the cartilage. When the vocal folds are approximated cavity infraglottic presents the form of a dome, whose roof is formed by the elastic cone (Gardner et al, 1975 and Lopes, 2004). Cone is the elastic thickness of the lamina propria of the mucosa of infraglottic rich in elastic fibers.

4. ANATOMICAL NOMENCLATURE

According to the international anatomical terminology Cavitas laryngis (cavity of the larynx) has the following structures:

- Aditus laryngis
- Vestibulum laryngis
 - Plica vestibularis
 - Rima vestibuli
- Ventriculus laryngis
- Sacculus laryngis
- Glottis
 - Plica vocalis
 - Rima glottidis
 - Pars intermembranacea
 - Pars intercartilaginea
 - Plica interarytenoidea
- Cavitas infraglottica
- Tunica mucosa
- Membrana fibroelástica da laringe

5. FINAL CONSIDERATIONS

Analysis of the theoretical consulted revealed some relevant data about concepts, foundations and divisions of the cavity of the larynx

In the current literature showed that most of the works consulted treats the theme of the larynx cavities incompletely in its conceptual definition, removing the concept of rhyme and rhyme glottic entrance. And in several literary accounts there are differences in the concepts of the glottis, rima glottis and regions of the larynx.

When consulting the international anatomical terminology was found that there disagreement with most authors surveyed. Comparing with the literary accounts it suppresses a coherent organization of the regions of the cavity of the larynx the vestibular region or higher, or glottic infraglottic middle and lower), and place different structures and regions on the same plane (eg, vestibulum laryngis, glottis, ventriculus laryngis, tunica mucosa, membrane elastic fiber of the larynx). So there is a need for greater clarification in the anatomic nomina of the international anatomical organization / definition of regions of the larynx and the disposition of their anatomical structures.

However, due to the study in different literary works, there were subsidies to reorganize conceptual foundations regarding anatomical cavities of the larynx. The topographical organization of the cavity of the larynx, based on the concepts of the authors consulted a possible disposition based anatomical structures of the organ. In view there is the possibility to supplement the available literature and to adopt an appropriate uniform terminology.

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LARYNX CAVITIES – REVIEW & UPDATE

ABSTRACT

Larynx studies have contributed for the understanding of variations and diseases of this important organ. Recent publications and even the most traditional anatomy books don't share the same opinion regarding the larynx cavities and that ultimately creates confusion and conflict. This study has as its main purpose to review the contemporary and acholar literature to redefine concepts and terminologies of the larynx cavity. It has been observed that the terminology and the contemporary definitions have been going through changes and distortions slowly due to the lack of basis regarding the larynx cavities. Bringing back the old fashioned concepts such as supraglottic and glottic regions, the study have brought up great help to reorganize anatomical conceptual fundamental regarding the larynx cavities as definitions of glottis rima e glottis that are largely used in intensive care units in the clinical and surgical practices.

WORD-KEYS: larynx, revision, anatomy. Keyword: larynx, revision, anatomy.

CAVITÉS DU LARYNX - RÉVISION ET MISE À JOUR

RÉSUMÉ

Les études de larynx ont contribué pour l'arrangement des variations et des maladies de cet organe important. Les publications récentes et même les livres d'anatomie les plus traditionnels mettent la part du `t la même opinion concernant les cavités de larynx et cela crée finalement la confusion et le conflit. Cette étude a en tant que son but principal de passer en revue la littérature contemporaine et acholar pour redéfinir des concepts et des terminologies de la cavité de larynx. On l'a observé que la terminologie et les définitions contemporaines étaient passés par des changements et des distortions slowly dus au manque de base concernant les cavités de larynx. Rapportant les concepts démodés tels que des régions supraglottic et glottic, l'étude ont évoqué la grande aide réorganiser le principe fondamental conceptuel anatomique concernant les cavités de larynx comme définitions de glotte du rima e de glotte qui sont largement employées dans des unités de soins intensifs dans les pratiques cliniques et chirurgicales.

PALAVRAS-CHAVES : larynx, révisión, anatomie.

CAVIDADES DE LA LARINGE - REVISIÓN Y ACTUALIZACIÓN

RESUMEN

Estudios en laringe han contribuido para la comprensión de variaciones y enfermedades de este importante órgano. Las publicaciones recientes y aún los libros de anatomía más tradicionales, no adoptan una uniformidad terminológica y conceptual en lo que concierne a las cavidades de la laringe – cavum laryngis - , lo que acaba generando confusión y conflicto de obras. Mientras, este estudio objetivó revisar la literatura contemporánea y erudita para redefinir conceptos y terminologías de la cavidad de la laringe. Se observó que la terminología y las definiciones contemporáneas vienen sufriendo lentamente amputaciones y distorsiones debido a la falta de fundamentación acerca de la cavidad de la laringe. Resucitando los conceptos suprimidos como región glótica y supraglótica, el estudio propició subsidios para reorganizar fundamentos conceptuales anatómicos acerca de las cavidades de la laringe, como definiciones de rima glottidis y glottis, que son ampliamente utilizadas en unidades de terapia intensiva, en la práctica clínica y quirúrgica.

PALABRA-LLAVES: laringe, revisión, anatomía.

CAVIDADES DA LARINGE – REVISÃO E ATUALIZAÇÃO

RESUMO

Estudos em laringe têm contribuído para o entendimento de variações e doenças deste importante órgão. As publicações recentes e mesmo os livros de anatomia mais tradicionais, não adotam uma uniformidade terminológica e conceitual no que diz respeito às cavidades da laringe, o que acaba gerando confusão e conflito de obras. Este estudo objetivou revisar a literatura contemporânea e erudita para redefinir conceitos e terminologias da cavidade da laringe. Observou-se que a terminologia e as definições contemporâneas vêm sofrendo lentamente amputações e distorções devido à falta de fundamentação a respeito da cavidade da laringe. Ressuscitando os conceitos suprimidos como região glótica e supraglótica, o estudo propiciou subsídios para reorganizar fundamentos conceituais anatómicos a respeito das cavidades da laringe como definições de rima glótica e glote, que são amplamente utilizadas em unidades de terapia intensiva, na prática clínica e cirúrgica.

PALAVRAS-CHAVES: laringe, revisão, anatomia.

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