THE ROLE OF LARYNGOGRAPHY IN CASES OF CANCER LARYNX

Thesis

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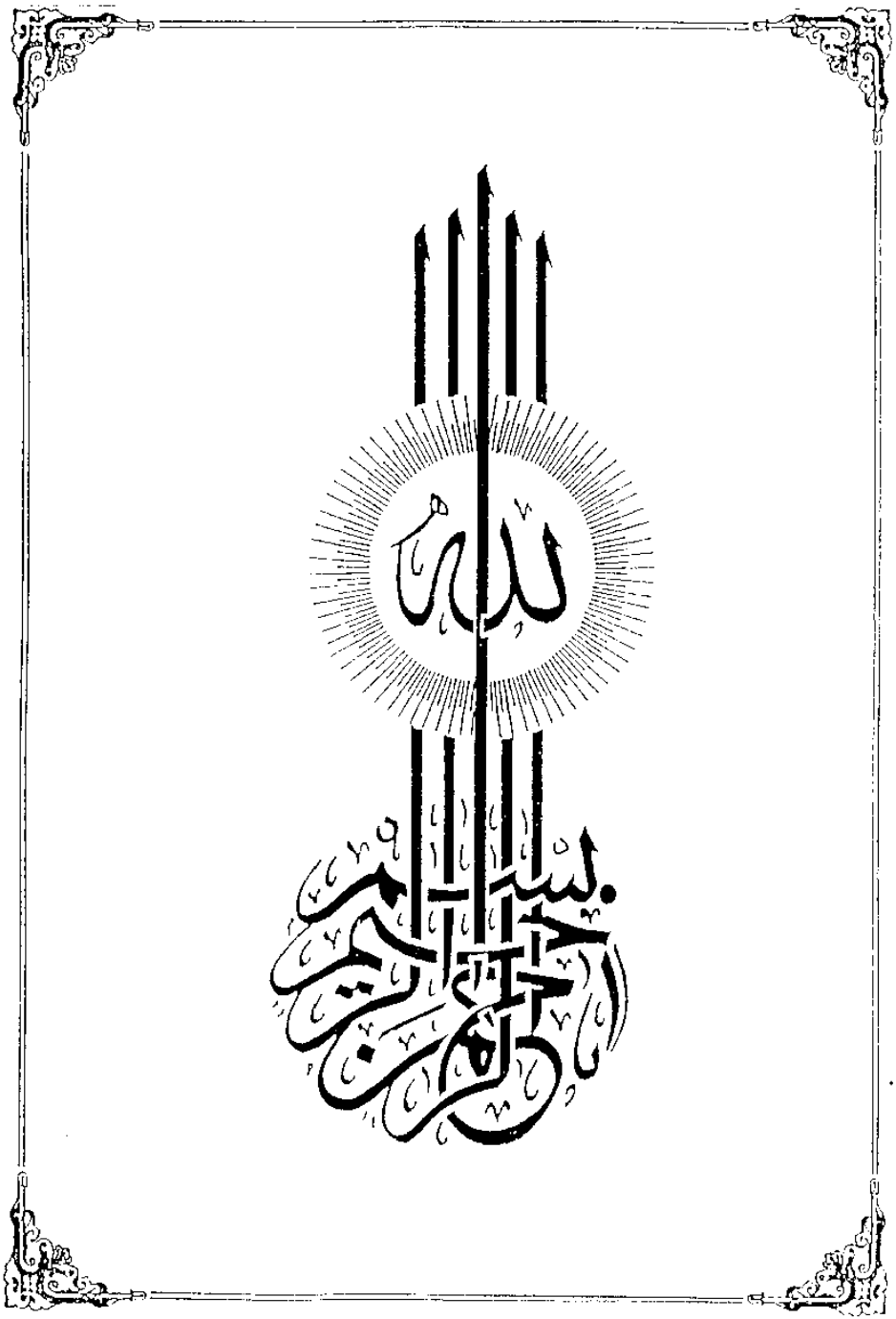

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Introduction

The aim of this work is to study the role of positive contrast laryngography in diagnosis of cancer larynx.

Although the clinical examination including indirect and direct laryngoscopy is very important and helpful, the diagnosis may be incomplete and indefinite without laryngography.

In this work, the interpretation of contrast laryngogram was discussed with reference to diognosis and evaluation of malignant tumours; particular emphasis was placed on its differentiation from non-malignant lesions.

Also, a study of the role of laryngography in accurate delineation of the tumour, in cases where it was impossible to define its lower limit, was done and thus a correct staging could be obtained.

Also, radiological assessment was done after a full positive contrast laryngographic examination and this was correlated with the clinical and pathological findings to allow a logical choice of treatment.

The role of contrast laryngography in following up the response of the tumour to radiation therapy was also studied.

ANATOMY OF THE LARYNX

Ballantine and Groves (1967), described the anatomy of the larynx as follows: "The larynx is situated in the mid line of the neck at the meeting of the digestive and respiratory passages. It lies in front of the largngopharynx from the level of the third to the sixth cervical vertebrae. It consists of a frame work of cartilages, connected by ligaments and membranes, lined by a mucous membrane and moved by muscles. The male larynx increases in size at puberty. All the cartilages enlarge and the projection of the thyroid cartilage produces the "Adam's apple". The hyoid bone is a structure pertaining to the tongue. (Fig. 1,2)

Laryngeal Cartilages:

The laryngeal cartilages form the main framework of the larynx. They are classified into. Unpaired and paired cartilages.

The unpaired cartilages are three:

1. Thyroid cartilage: Is the largest. Each half consists of:

a) Ala (Lamina): An almost square plate of cartilage. It begins to ossify at the age of 25 and may be completely converted to bone by 65.

The two alae meet in the midline, forming an angle of about 90 degrees in man, about 120 degrees in women. The laryngeal prominence is formed in men by this more acute angle.

The anterior portion is related to the glottis, the posterior portion forms the lateral boundary of the pyriform fossa. The point of junction of the upper borders of the alae is idented by the V-Shaped thyroid notch. An oblique line, the site of musculas attachments, runs downwards and forwards on the outer surface of each lamina.

b) Superior cornu: Arises from the posters superior angle of the ala.

c) Inferior cornu: Arises from the postero-inferior angle of the ala. There is a small oval facet on its inner surface, for articulation with the cricoid cartilage.

2. Cricoid cartilage: It is thicker and stronger than the thyroid cartilage. It resembles a signet ring, narrow in front, broad behind. Ossification begins at the age of 30 and may be complete by 65. It consists of:

a) Lamina, posteriorly: This is flat and quadrate in shape. Its post surface is marked by a vertical ridge in the midline, with a shallow depression on each side. The upper part of the ridge. There is a smooth oval facet on each side of the upper border of the lamina, for articulation with the arytenoid cartilage.

b) Arch, anteriorly: This is narrow in front and expands posteriorly to the lamine.

The upper border passes obliquely upwards and backwards. The lower border is straight and almost horizontal. There is a rounded facet at the function of the arch with the lamina on each side, for articulation with the inferior cornu of the thyroid cartilage.

3. Catilage of Epiglottis: It rises up behind the tongue. It is thin and leaf-like. The stem, directed downwards, is long and thin and is attached to the posterior surface of thyroid alae at their function. The free

border, directed upwards, is broad and rounded from side to side.

The anterior surface is free in its upper part but is separated from the hyoid bone and thyrohyoid membrane by some fatty tissue in its lower part (pre-epiglottic space).

The posterior surface is indented by several small pits, in which mucous glands are embedded.

The tubercle of the epiglottis projects backward in its lower part.

The paried cartilages are three which are:

1. Arytenoid cartilages: Are the largest. They are pyramidal in shape:

a) The posterior surface, is triangular and concave. It extends laterally into a muscular process.

b) The anterolateral surface, is convex. It extends forwards into a vocal process.

c) The medial surface, is narrow, smooth and flat.

d) The inferior surface, or base, is concave. It articulates with the cricoid cartilage.

e) The apex, curves backwards to articulate with the corniculate cartilage.

2. Corniculate cartilages: "The cartilages of Santorini".

These are small. They articulate with the apices of the arytenoid cartilages and prolong them backwards and medially. They give attachment to the upper fibres of the oesophagus.

3. Cuneiform cartilages, "The cartilages of Wris berg".

These are small barsof yellow elastic cartilage. There is one in each aryepiglottic fold, where it acts as a passive prop. They do not articulate with any other cartilage.

Laryngeal Joints; The two important joints of the larynx on each side are:

1. Cricothyroid joint:

Between the inferior cornu of the thyroid cartilage and the facet on the cricoid cartilage at the junction of arch with lamina. It is synovial joint with a capsular ligament.

Two movements occur:

a) Rotation, Though a transverse axis.

b) Gliding , Slightly.

2. Crico-arytenoid joint:

Between the base of the arytenoid cartilage and the facet on the upper border of the lamina of the ceicoid cartilage. It is also a synovial joint with a capsular ligament. Two movements occur:

a) Rotation: Of the artytenoid, on a vertical axis. The vocal process moves medially and laterally.

b) Gliding: The arytenoids move towards or away from each other. A strong posterior crico-arytenoid ligament prevents excessive movements of the arytenoid over the cricoid.

Laryngeal Ligaments And Membranes:

These are of two types, Intrinsic and extrinsic:

1. Intrinsic: Uniting the cartilages of the larynx to one another:

a) Elastic membrane of the larynx:

It is the fibrous frame work of the larynx. It lies beneath the laryngeal mucosa and is divided into upper and lower parts by the ventricle of the larynx. The upper part contributes to the support of the ary-epiglottic and ventricular folds. The ventricular ligament is a thickening of the free edge.

b) Conus elasticus: or crico vocal membrane, is the name given to the lower part of the elastic membrane of the larynx. It is composed mainly of yellow elastic tissue below. It is attached to the superior border of the cricoid, cartilage. Above it is attached:

i) Infront to the deep surface of the angle of the thyroid cartilage.

The median cricothyroid ligament is formed by the thickened anterior part of the conus. It broadens out from its upper attachment to the lower border of the thyroid cartilage towards its lower attachment to the upper border of the cricoid cartilage.

ii) Behind to the vocal process of the arytenoid cartilage. The vocal ligament is the free upper edge of the conus between these points of attachment.

c) Thyro-Epiglottic ligament: Attaches the epiglottis to the thyroid cartilage.

2. Extrinsic: Uniting the cartilages of the larynx to the skeletal structures outside the larynx:

a) Thyrohyoid membrane: Is abroad sheet of fibre elastic tissue: Below, it is attached to the thyroid cartilage at the upper border of alae and front of superior cornua.

Above: It is attached the hyoid bone at the upper margin of posterior surface of body. And upper margin of greater horns. The subhyoid bursa separates the membrane from the posterior surface of the body. Upwards movement of the larynx during deglutition is facilitated by the bursa. The membrane is pierced on each side by the superior laryngeal vessels, and the internal branch of superior laryngeal nerve.

b) Median thyrohyoid ligament: Is the thickened median portion of the thyrohyoid membrane.

c) Lateral thyrohyoid ligament: Form the thickened posterior border of the thyrohyoid membrane. They are attached on each side, below to the tips of

superior cornua of the thyroid cartilage, and above to the posterior ends of the greater horns of the hyoid bone. The cartilage triticea is a small cartilage often found in each ligament.

d) Cricotracheal membrane: Is attached below to the 1st. ring of the trachea, above to the lower border of the cricoid cartilage.

e) Hyo-Epiglottic ligament: Attaches the epiglottis to the hyoid bone.

Laryngeal Muscles:

These are of two types:

1. Intrinsic:

Between one laryngeal cartilage and another:

a) Abductors of the vocal cords: There is only one on each side which is the posterior crico-arytenoid muscle:

It opens the glottis. It arises from the depression on the posterior surface of the cricoid lamina, and is directed and inserted upwards and outwards. Into the back of the muscular process of the arytenoid cartilage.

b) Adductors of the vocal cords: There are three on each side:

i) Lateral crico-arytenoid muscle:

It arises from the upper border of the arch of cricoid cartilage, directed upwards and backwards, and is inserted into the front of the muscular process of the arytenoid cartilage.

ii) Transverse portion of inter arytenoid muscle:

Is a single muscle. It arises from the back of the muscular process and lateral border of one arytenoid cartilage, and is inserted into the corresponding portion of the other .

iii) External portion of the thyro arytenoid muscle:

Forms a thin, sheet which lies outside the vocal cord, ventricle and sacule of the larynx. It arises anteriorly from the lower half of the angle of the thyroid cartilage and from the crico thyroid ligament, directed backwards, upwards, and outwards; and is inserted: Into the anterolateral surface of the arytenoid cartilage. Its upper forms the ventricular band.

c) Tensors of the vocal cords: There are two on each side: