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بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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LARYNGEAL TUMORS ASSESSMENT BY COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING.

A THESIS

Submitted to Benha Faculty of Medicine
Zagazig University
In partial fulfilment of the
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DOCTOR OF RADIODIAGNOSIS

BY

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INTRODUCTION
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Diseases of the larynx are often of urgent concern to the patient because of the involvement of the airway. Laryngeal carcinoma may arise insidiously with only mild hoarseness at first, but prompt diagnosis is required for effective antitumor therapy to be instituted. **McGee et al., 1989.**

Cancer of the larynx accounts for about 2% of all reported cases of malignant disease. **Devita et al., 1985.**

An average of 1-2 persons out of every 100,000 inhabitants die of laryngeal cancer. There is one new case of laryngeal carcinoma per 100,000 populations per year. The natural history of untreated laryngeal carcinoma indicates a median time of about 12 months from apparent onset to death. The key to successful management of laryngeal carcinoma is early diagnosis and appropriate curative treatment applied when the lesion is localized. **Batsakis, 1979.**

Laryngeal carcinomas are detected by indirect and direct laryngoscopy, but limitations of these methods in determining the exact size and anatomic location of such tumors are well recognized. The mucosal surfaces are visualized by laryngoscopy, but extension into the submucosal, preepiglottic, and paraglottic tissues could not be assessed. Large fungating supraglottic lesions may hide the glottic and subglottic areas from view. Tumor invasion of supporting laryngeal cartilages, including the petiole of the epiglottis, may be difficult or impossible to ascertain. **Archer et al., 1981.**

Additional informations concerning these aspects can be gained by radiological examination of the larynx. These include plain films, tomography, fluoroscopy, cinefluorography, zeroradiography and laryngography. **Doust, Tig, 1974 and Woener et al., 1974.**

In recent years, Computed tomography (CT) and Magnetic resonance imaging (MRI) have been added. **Archer et al., 1981 and Lufkin et al., 1986.** All methods of examinations, however, have their blind areas of deficiencies. **Mancuso et al., 1978.** In the past, when the only surgery for cancer of the larynx was total laryngectomy and when radiation therapy was given to large ports, these deficiencies were less critical. **Archer et al., 1981 and Mancuso et al., 1978.** However, with the recent development of conservation surgery of the larynx clinicians and radiotherapists have often questioned which image procedure to order preoperatively or before planning treatment portals. **Hanafee et al., 1979.**

The conservation surgery of the larynx offers the patient a useful voice, good swallowing capabilities, and greatly improved survival statistics, provided surgery is carefully planned. **Hanafee et al., 1979.**

Modern laryngeal imaging uses either computed tomography (CT) or magnetic resonance (MR) imaging to show the relationship of disease to very small laryngeal structures. **Castelijns et al., 1987 and Lufkin, Hanafee, 1984.**

The aim of this work is to study the laryngeal tumors by computed tomography (CT) and magnetic resonance imaging (MRI) for pretreatment assessment and staging to choose the proper way of treatment.

REVIEW OF LITERATURE

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-Anatomy of the larynx:

The larynx is a musculo-cartilaginous tube, which extends from the tip of epiglottis to the inferior margin of the cricoid cartilage, opposite the fourth, fifth and sixth cervical vertebrae (fig.1). **Snell, 1991, Romanes, 1981, Grant, 1972 and Lee, 1987.**

-Laryngeal cartilages (fig. 1, 2,3,4 &5):

The laryngeal cartilages are nine in number. Three (the thyroid, cricoid and epiglottis) are single. The rest (the arytenoids, corniculates and cuneiforms) are paired. **Warwick, Wiliams, 1973, Zuckerman, 1981, Alkesson et al., 1990 and Smith et al., 1983.**

(A) The thyroid cartilage (fig. 1,2,3,4 & 5):

It is a shield shaped hyaline cartilage open behind. It is the largest of the laryngeal cartilages and composed of two quadrilateral alae fused in the midline anteriorly to form an angle of 90 degrees in males and 120 degrees in females. In males, the fused anterior border forms a projection in front of the neck (the laryngeal eminence or Adam's apple). This eminence is generally absent in females owing to the wide angle subtended by the alae. A small narrow strip of cartilage (the interthyroid cartilage) separates the two alae anteriorly in childhood. **Weir, 1987.**

The V-shaped notch is situated just above the laryngeal eminence. The superior and inferior cornua project from the posterior border of each ala. The superior cornu is long and narrow and curves upward, backward and medially, ending in a round knob to which the lateral thyrohyoid ligament attaches, whereas the shorter and thicker inferior cornu curves downward and medially.

On the medial surface of its lower end there is a small oval facet for articulation with the cricoid cartilage. **Berman, 1985 and Spector, 1985.**

The inferior border of this cartilage is concave. The inferior thyroid tubercle projects downward from its middle part. The conus elasticus extends from this tubercle to the anterior and superior border of the cricoid cartilage. **Weir, 1987, Hast, 1987 and Berman, 1985.**

The external perichondrium adheres firmly to the superior rim, both cornua, and the posterior rim of the thyroid cartilage. It blends with the thyrohyoid membrane above, but it is loosely attached to the outer surface of the cartilage, making the preservation of this layer possible during conservation surgery. Internally, the inner perichondrium is tightly bound to the inner surface of the thyroid ala. However, it is thinner than the external perichondrium. About half the distance between the thyroid notch and the inferior margin, a small area (deficient in perichondrium) serves as the attachment of the anterior commissure tendon. **Berman, 1985 and Spector, 1985.** One centimeter above this area, the petiole of the epiglottis is attached to the inner aspect of the thyroid notch by the thyroepiglottic ligament. **Spector, 1985.** Below this point on each side of the midline, the vestibular and vocal ligaments, and the thyroarytenoid, thyroepiglottic, and vocalis muscles are attached. **Weir, 1987.**

(B) The cricoid cartilage (fig. 1,2,3,4 &5)

The cricoid cartilage is unpaired signet ring shaped hyaline cartilage. It lies immediately inferior to the thyroid cartilage and articulates with it. It is the only complete ring in the laryngo-tracheo-bronchial tree, and it is formed by a narrow anterior arch and a wide quadrate lamina posteriorly. **Weir, 1987, Berman, 1985 and Spector, 1985**. On the posterolateral aspect of each side, there is a small circular facet for the inferior thyroid cornu. The anterosuperior surface of the lamina shows two oval facets for articulation