Management of Thyroid Carcinoma

Essay

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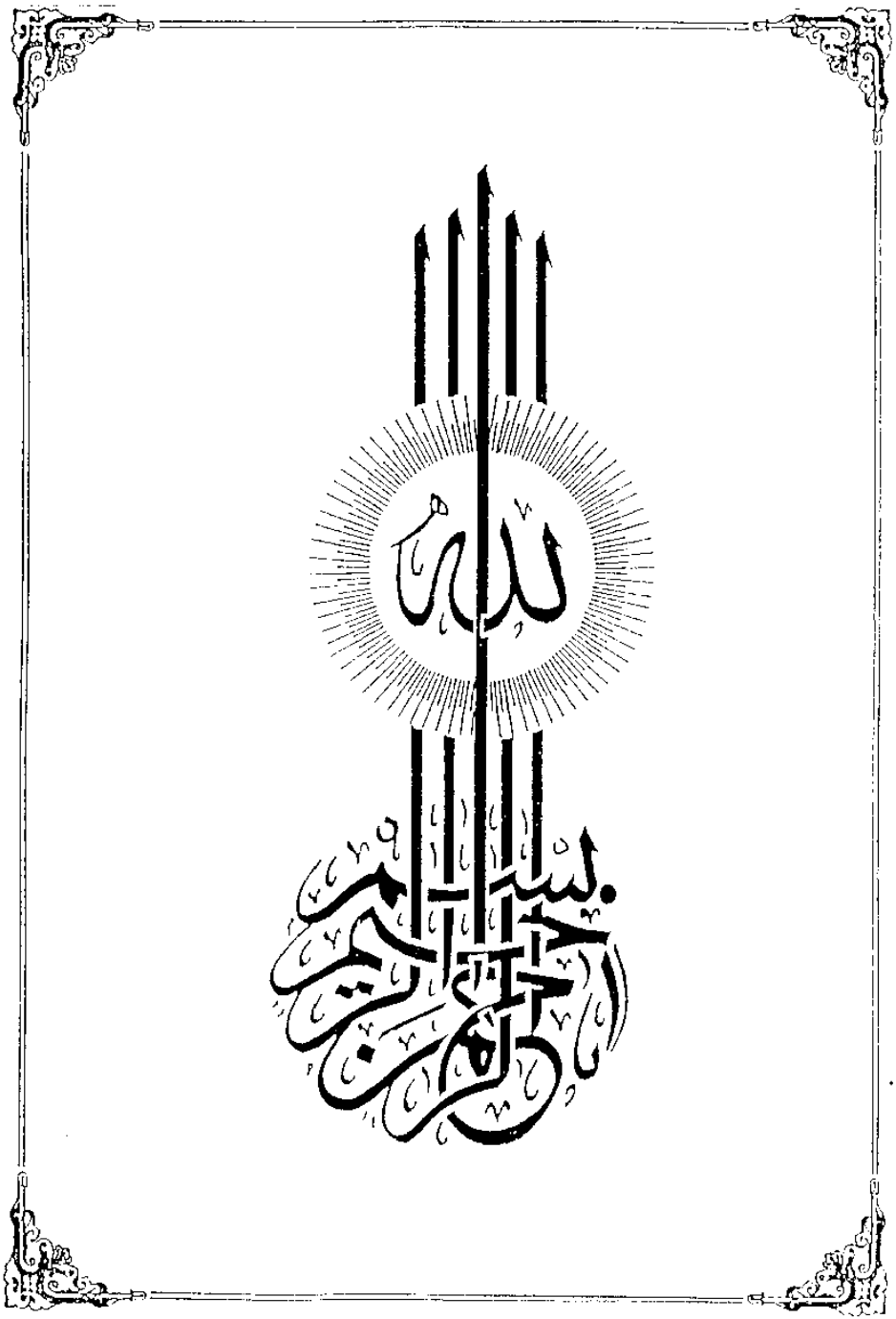
بسم الله الرحمن الرحيم

«وَيَسْئَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ مِنْ أَمْرِ رَبِّي
وَمَا أُوتِيتُم مِنَ العِلْمِ الا قَلِيلًا»

صدق الله العظيم

سورة الإسراء «آيه ٨٥»



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Introduction

No where in the consideration of head and neck cancer is there more controversy than over the management of thyroid malignancy.

Part of the problem is the uncommoness of the disorder depriving the surgeon with the wealth of data in his own experience necessary for accurate decision making.

The attack rate for most countries averages 2 to 3 cases per 100,000 population with female predominance and the ratio is 3:1 approximately.

(Donald, 1988)

Several factors have been associated with an enhanced propensity toward the development of thyroid malignancy. The major risk factor is the exposure of the head and neck to external beam irradiation during childhood or adolescence.

Malignancies that occur in patients following X-ray exposure are almost always well-differentiated papillary carcinoma and are usually multicentric. They also metastasize frequently to cervical lymph nodes (up to 50% at the time of initial presentation), and tend to recur frequently.

Another factor seemingly associated with thyroid neoplasia is dietary intake of iodine. In areas of endemic goitre, where deficiency of iodine intake is common,

subjects have had higher than expected incidences of follicular carcinoma, *Orlo H. Clark et al (1991)* whereas papillary carcinoma have been found to be more prevalent in regions of relatively high iodine intake.

Thyroid malignancy seems to have a better prognosis when associated with Hashimoto's thyroiditis than without it, indicating that an immune response to the tumour may indeed take place and retard growth of the neoplasm, with the development of more refined techniques of investigations, the number of thyroid cancers diagnosed pre-operatively has steadily increased. These include, thyroid scintillation scanning, ultrasonography, needle biopsy and aspiration, and thyroid stimulating hormone suppression.

New methods of investigation help in assessment and mangement of this disorder, thus providing the patient the best chance for cure.

Different methods for treatment of thyroid neoplasms include, surgery, thyroid hormone therapy, and radiation therapy either as radioactive iodine or external irradiation are available.

The importance of thyroid carcinoma lies in the fact that it behaves in unusual manner both as regards its wide histological variation and its clinical evaluation.

This variation in behaviour raises special problems as regards the line or lines of treatment in any single case, so there is a great difference in opinion reflected in the literature concerning even the fundamental rules of management.

(Kramer and Wells, 1989)

AIM OF THE WORK

Our essay is concerning with the reflection of different controversies in diagnosis and management of thyroid carcinoma.

Surgical Anatomy of the Thyroid gland

Surgical Anatomy of the Thyroid Gland

The thyroid gland consists of two symmetrical lobes united infront of the second, third and fourth tracheal rings by an isthmus of thyroid tissue.

Each lobe is pear shaped consisting of a narrow upper pole and wide lower pole. It lies under the cover of the sternothyroid and sterno-hyoid muscles to the side of the larynx and trachea; the upper pole lies tucked away beneath the upper end of the syterno-thyroid muscle between it and the ala of the thyroid cartilage. The lower pole extends along the side of the trachea as low as the sixth tracheal ring.

The gland possesses its own delicate histological capsule or fascia propria. It lies free within an envelope of pretracheal fascia. The isthmus joins the anterior surfaces of both lobes towards their lower poles. The posterior surface of the isthmus is firmly adherent to the second, third and fourth rings of the trachea and the pretracheal fascia is here fixed between them. This fixation and the investment of the whole gland by pretracheal fascia are responsible for the gland moving up and down with deglutition. *(Fig. 1)*

Pyramidal Lobe:

A small protion of the gland substance often projects upwards from the isthmus generally to the left of the midline, is named the pyramidal lobe and represents a development of glandular tissue from the caudal end of the thyro-glossal duct; it is attached to the inferior border of the hyoid bone by fibrous

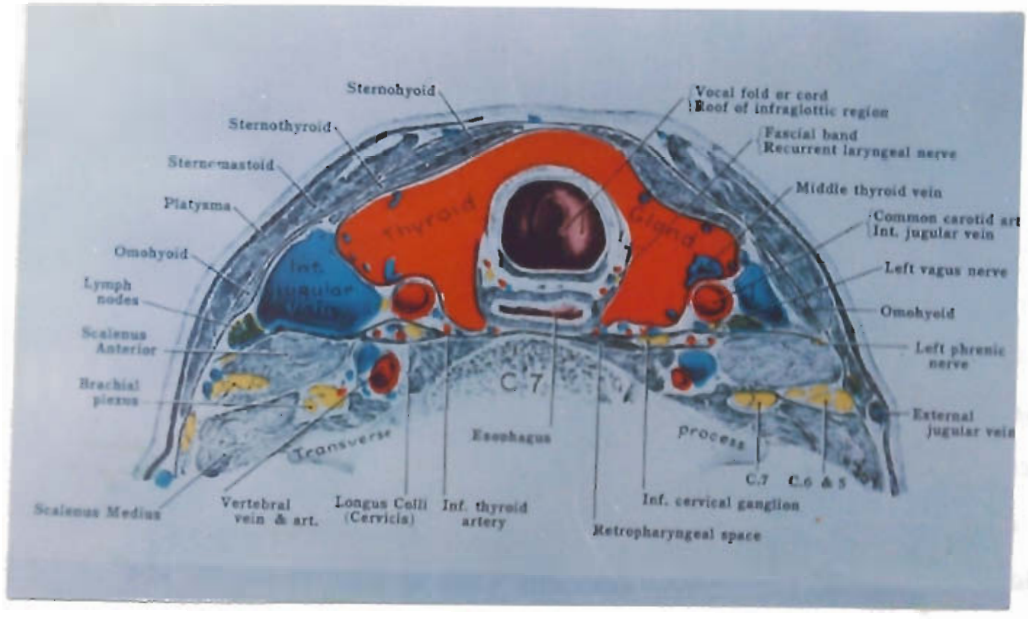

Fig. (1) A cross section of the neck at the level of (C7) demonstrating the Thyroid gland and its surrounding structures. (after Last, 1990)

tissue, sometimes muscle fibres are present in it and named as levator glandulae thyroidae and are innervated by branch of the external laryngeal nerve.

Accessory Thyroid Glands:

Separate masses of thyroid tissue are not uncommonly found near the hyoid bone in the tongue, in superior mediastinum or beneath the sterno-mastoid muscle.

(Last, 1990)

Blood Supply:

1) The Superior Thyroid Artery:

It is the first branch from the anterior aspect of the external carotid artery. After giving off its sterno-mastoid and superior laryngeal branches, it pierces the pretracheal fascia as a single vessel to reach the summit of the upper pole, it divides on the gland into anterior branch that runs down to the isthmus and a posterior branch that runs down to the back of the lobe and anastomoses with an ascending branch of the inferior thyroid artery from the lower pole. The external laryngeal nerve, a branch of the superior laryngeal nerve, descends on the fascia of the inferior pharyngeal constrictor, relates closely to the superior vascular pedicle of the thyroid and then leaves this at a variable height above the gland to travel medially to its distination in the crico-thyroid muscle which is a tensor of the vocal cord. Damage to this nerve alters the voice quite significantly and especially noticeable in singers.

2) The Inferior Thyroid Artery:

It arises from the Thyro-cervical trunk from the Subclavian artery. It divides outside the pretracheal fascia into four or five branches that pierce the fascia separately to reach the lower border of the gland. The recurrent laryngeal nerve lies normally behind these branches but it is common for it to pass between them before they pierce the pretracheal fascia. The nerve always lies behind the pretracheal fascia and if this structure remains intact during thyroidectomy, the nerve will not have been divided. It is close behind the fascia however, and may be bruised or caught in a ligature hence, the advisability of ligating the inferior thyroid artery lateral to the gland before it begins to divide into terminal branches.

3) The Thyroidea Ima Artery:

It enters the lower part of the isthmus. In 3% of the individuals, it springs from the brachio-cephalic trunk or directly from the arch of the aorta.

(IG. Lorentz, 1986)

Venous Drainage:

The venous drainage of the upper pole follows the superior thyroid artery. This vein, the superior thyroid vein, enters either the internal jugular vein or common fascial vein in about equal proportions.

The middle thyroid vein is short and wide, and it is usually present. It passes from the middle of the lobe directly into the internal jugular vein. From the isthmus and lower pole, the inferior thyroid veins form a plexus that lies in the pretracheal

fascia infront of the cervical part of the trachea. The plexus drains into the brachio-cephalic veins; most of it into the left one.

(Tzinas et al., 1976)

Nerve Supply of the Thyroid Gland:

The bulk of the sympathetic supply is derived from the middle cervical ganglion, travels with the inferior thyroid artery. Some fibres from the superior cervical ganglion travel with the superior thyroid artery, the sympathetic fibres are vasoconstrictors, vagus nerve filaments are traceable to the gland. Their purpose is unknown.

Microscopic Anatomy:

A section shows the typical colloid vesicles whose appearance depends on the state of the activity of the gland. In resting state, the vesicles are uniformly distended with structureless colloid. They are rounded in outline and lined with a well stained layer of low columnar epithelium, clumps of small round cells lie between the vesicles, they may produce calcitonin. In the more active state, the amount of colloid is less and the vesicles are uniformly smaller and crinkled in outline. The lining columnar epithelium is much taller. This appearance is well seen in the foetal gland.

(Last, 1990)