

SWELLINGS OF THE THYROID GLAND

ESSAY

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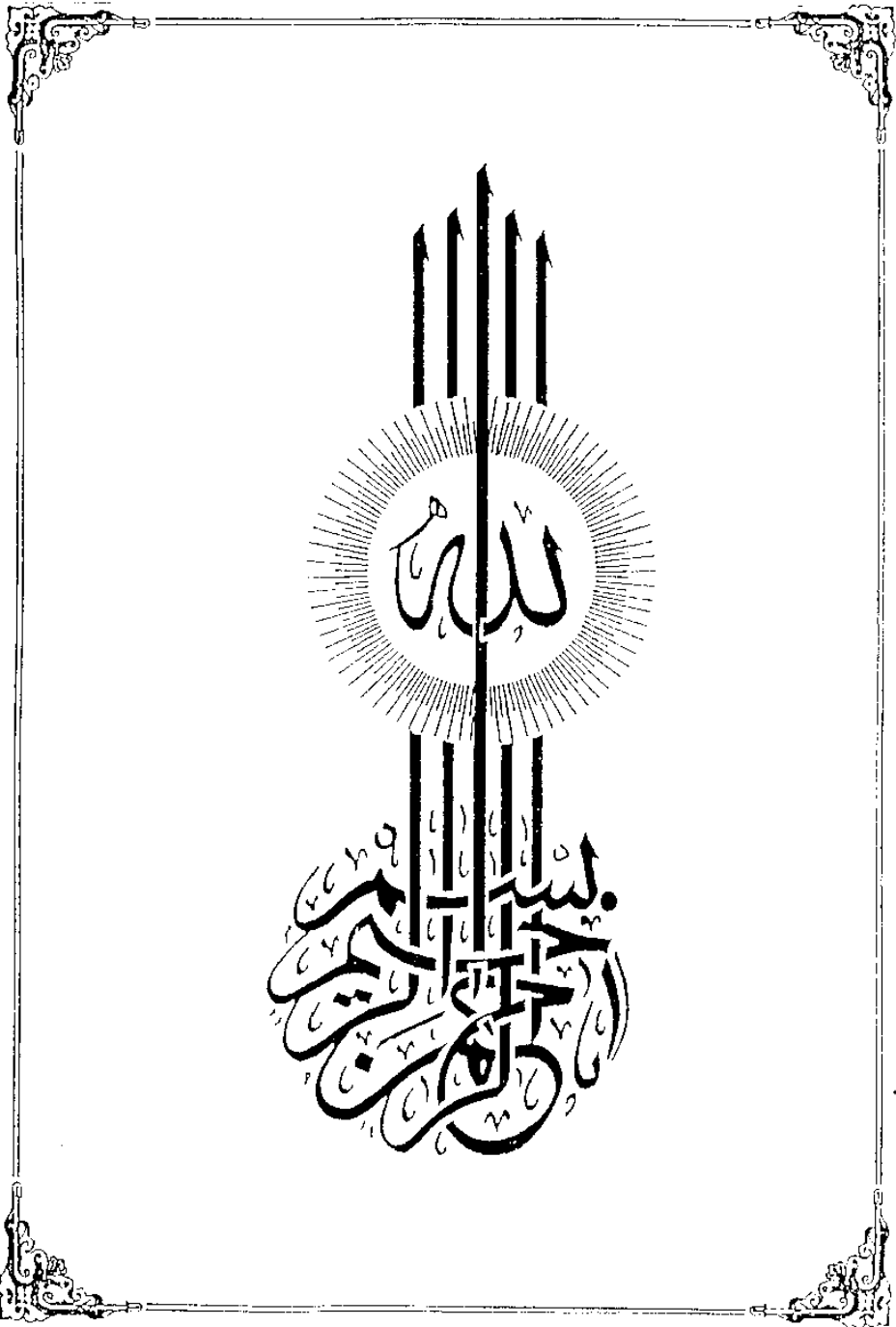
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صدق الله العظيم



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INTRODUCTION

Thyroid swellings are one of the common problems met with in daily surgical practice.

In Egypt although the Nile Valley is not known to be an endemic area, except the Western Oases districts, yet hardly does any outpatient clinic not have several thyroid patients.

Goiter is a term applied to enlargement of the thyroid gland due to any cause. There are many types of goiter, simple goiter, toxic goiter and special goiter which include thyroiditis and carcinoma of thyroid.

The aim of this work is to review the available literature in this subject with special reference to the pathology, investigations and management of each type of thyroid swellings.

Embryology

Anatomy

Histology

EMBRYOLOGY OF THE THYROID GLAND

The thyroid gland is present in all the vertebrates. (Goldsmith, 1949).

The thyroid gland is the earliest glandular structure to appear. (Norris, 1916).

It appears about the third week, when the embryo is only 3.5 to 4.0 mm. in length. It begins as a proliferation of epithelial cells in the floor of the developing pharynx at a point indicated by the foramen cecum, a dimple like depression at the base of the tongue.

As the thyroid primordium descends, it acquires mesodermal contributions such as the parafollicular C cells, which will ultimately secrete calcitonin. During its descent the gland remains connected to the floor of the pharyngeal gut by means of a narrow canal, the thyroglossal duct. It is so named because it is hollow at first. This duct becomes solid and finally disappears.

With further development, the thyroid gland descends in front of the hyoid bone and the laryngeal cartilages. It reaches its final position in front of the trachea in the seventh week. At this time it has acquired a small median isthmus and two lateral lobes. At the end of the third month of foetal development, follicles containing colloid

become visible and it is probable that the gland begins to release thyroid hormone at this time.

Both T_4 , TSH are detectable later during the second trimester. (Ingbar and Waeber, 1980).

ANATOMY OF THE THYROID GLAND

The thyroid gland is the largest endocrine gland in the adult. Its weight is somewhat variable, in non goitrous adult it is about 15 to 20 gm.

It is ensheathed by the pretracheal layer of the deep cervical fascia and consists of right and left lobes connected across the median plane by a narrow portion termed the isthmus.

The lobes are conical in shape. The apex of each being directed upwards and laterally. Each lobe is 5 cm long, and extends vertically from the middle of the thyroid cartilage to the 6th ring of the trachea. It is brownish-red highly vascular organ situated at the front and sides of the lower part of the neck opposite the 5th, 6th, 7th cervical and 1st thoracic vertebrae.

A triangular projection of gland tissue called the pyramidal lobe extends upwards from the left side of the upper border of the isthmus and is connected to the hyoid bone above by a fibrous band or a muscle slip (Levator glandulae thyroideae).

Each lobe is roughly triangular on section :

- The medial surface is related to two tubes, oesophagus and trachea , two nerves, recurrent and external

laryngeal nerves, two muscles inferior constrictor and cricothyroid.

- The posterior surface overlaps the common carotid artery and covers the terminal part of the inferior thyroid artery.

- The superficial surface is covered by the infrahyoid muscles and the sternomastoid overlapping.

The isthmus connects together the lower parts of the two lobes. It measures about 1.25 cm. transversely and the same vertically and usually covers the 2nd and 3rd rings of the trachea.

Small detached portions of thyroid tissue are sometimes found in the vicinity of the lobes or above the isthmus. They are called accessory thyroid glands.

Remnants of the thyroglossal duct may persist between the isthmus and the foramen coecum of the tongue and may give rise to accessory nodules of thyroid tissue or cysts, situated in or near the median plane, even in the substance of the tongue.

The thyroid gland is covered by two capsules, a true capsule and a false capsule.

The true capsule is formed by the peripheral condensation of the connective tissue of the gland.

The false capsule is derived from the pretracheal fascia,

The numerous blood vessels of the thyroid pierce both its capsules and then ramify to form a dense plexus of thin walled vessels immediately beneath the inner true capsule. The space between the two capsules is traversed by the arterial and venous trunk.

The suspensory ligament of Berry is a thickening of the pretracheal fascial investment of the thyroid. It passes from the inner and back part of the gland to the cricoid cartilage. The two ligaments right and left form a sling anchoring the gland to the larynx. They increase in size in large goitres thus preventing the gland falling away from the larynx.

The recurrent laryngeal nerve is in immediate contact with the back of the ligament.

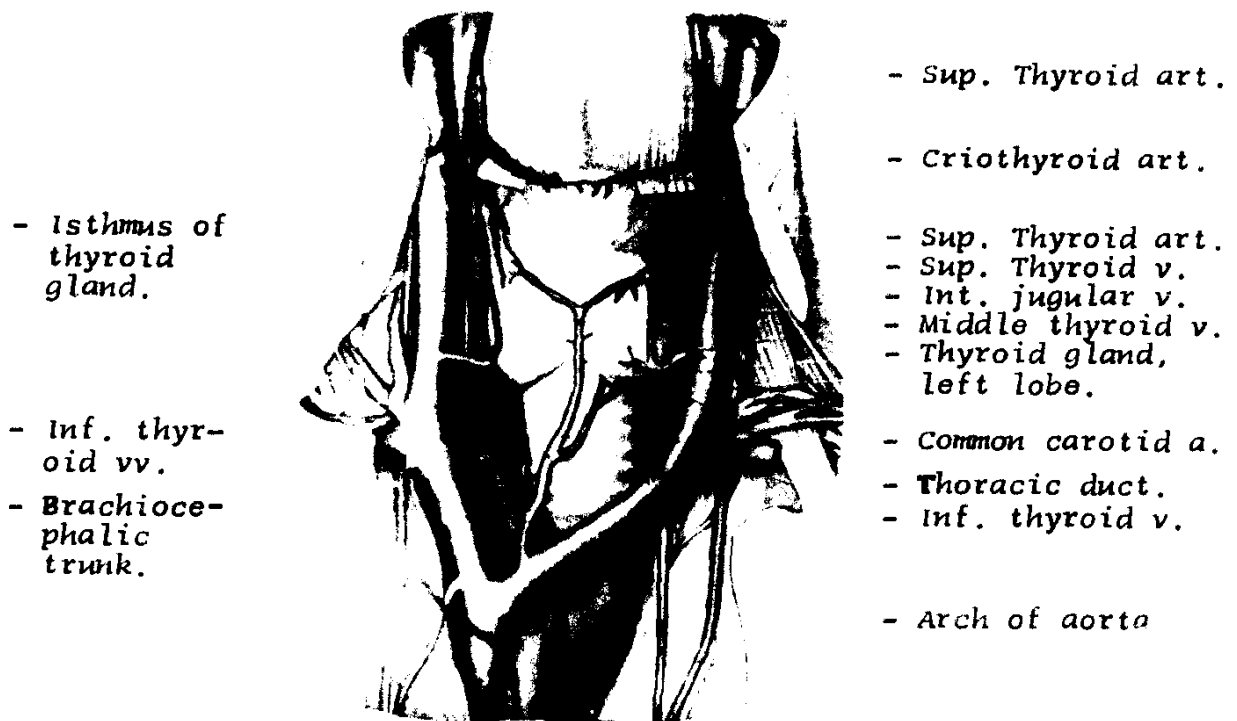
BLOOD SUPPLY OF THE THYROID GLAND : (Fig. 1)

The gland has an abundant blood supply. The normal flow rate of blood through the gland is about 5ml. blood/gm. of thyroid/min. (De Groot, 1975).

Arteries :

1- Superior thyroid artery :

It arises from the front of the external carotid artery, near its origin and runs downwards and forwards to



A dissection of the lower part of the front of the neck and of the superior mediastinum (Gray's, 1967).

(Fig. 1)

reach the upper pole of the lobe of the thyroid gland. Fowler and Hanson (1929) pointed out that the superior thyroid artery divides at the upper pole of each lobe into two or three main branches spread out chiefly on the anterior and lateral surface of the gland to supply the upper half of the lobe and finely anastomose with branches from the inferior thyroid artery. The superior thyroid artery also having an anterior branch which anastomoses with its fellow along the upper border of the isthmus and a posterior branch which anastomoses with the inferior thyroid artery. (Gardner et al., 1960). It also divides at the apex of each lobe into two or three branches (Romanes, 1972).

2- Inferior thyroid artery :

This is a branch of the thyrocervical trunk (which arises from the 1st part of the subclavian artery) and has a posterior relation of the gland entering it from its deep or posterior surface. It has an ascending branch which anastomoses with the superior thyroid and a descending branch which anastomoses with its fellow from the opposite side along the lower border of the isthmus. (Gardner et al., 1960).

3- Thyroidea ima artery :

An occasional vessel arising from the brachiocephalic trunk or the arch of the aorta. It ascends upon the front of

the trachea. When present it enters the lower part of the isthmus. The thyroidea ima artery is generally present in about 10% of cases and is usually on the right side. (Wangensteen, 1929).

4- Accessory thyroid arteries :

These are small branches which arise from the small arteries to oesophagus and trachea.

The anastomoses of all four or five major vessels of the thyroid gland occur in the region of the isthmus. (Gudernatch, 1953). It is demonstrated that after ligation of the four thyroid arteries material injected by way of ascending aorta reach the gland. (Wangensteen, 1929).

V e i n s :

1- The superior thyroid vein :

Begins in the substance of the gland and on its surface. It leaves the upper pole of the gland and taking its guide the outer border of the omohyoid crosses the common carotid artery to terminate in the internal jugular vein. It receives superior laryngeal and cricothyroid veins.

2- The middle thyroid vein :

It collects the blood from the lower part of the thyroid gland and receives some veins from the larynx and