PATHOLOGICAL STUDY OF THE DIFFERENT DISEASES OF THE THYROID GLAND WITH SPECIAL REFERENCE TO ITS TUMOURS

THESIS

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BY

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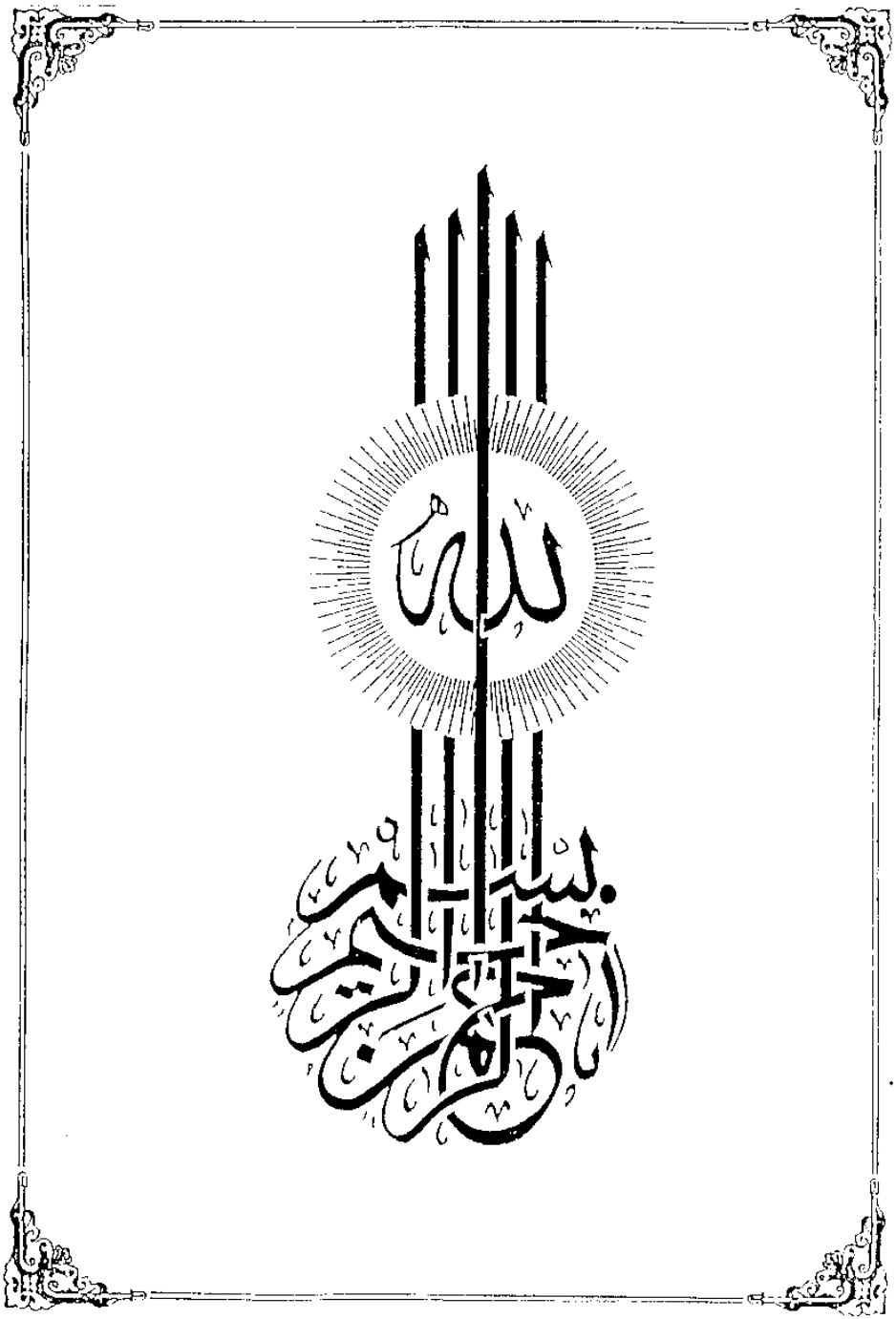

C O N T E N T S

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INTRODUCTION AND AIM OF THE WORK

Although the thyroid gland is simple in structure and apperently simple in function, we have already seen that the pathological processes present many proplems (Boyd (1970).

A large varieties of classifieations were postulated and resulted in confusion of the subject (Doniach 1966).

The subject of thyroid neoplasms is perhaps the most confused and continuous branch of thyroid pathology, this is particularly true in classification (Boyd 1970).

In the thyroid, as in other endocrine glands, it is difficult to distinguish between hyperplasia and neoplastic conditions and between benign and malignant tumours. (Hedinger and Sobin 1974).

It stricks our attention the presence of a large number of thyroid biopsies in our department. The biopsies recorded in the last ten years were collected and restudied as regard age sex, incidence and histopathological findings.

The findings obtained by examining cases of thyroid tumours, were evaluated according to W.H.O classification, by Hedinger and Sobin (1974), in order to avoid unnecessary contraversy.

This classification is based on microscopic morphology rather than histogenesis. (Hedinger and Sobin 1974).

SECTION I

REVIEW OF LITERATURE

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THE NORMAL THYROID GLAND

Development

The origin of the thyroid gland is closely related to the upper part of gullet. It is formed from a midline out-pouching of the endoderm in the floor of the primitive buccal cavity, descending in the neck and fusing with the fourth or fifth branchial pouches and the ultimo-branchial bodies (Gray's anatomy (1962), Fisher and Dussault (1974).).

Ultimo-branchial bodies are the source of parafollicular cells (Gray's anatomy 1973).

The thyroglossal duct connects the gland to its origin for a time and then disappears.

Remenant of the duct, when persists, represent the pyramidal lobe. (Gray's anatomy 1973, Fisher and Dussault 1974).

Microscopicaly, the mass shows solid acini which become hollowed. These disappear to be replaced by larger typical vesicles produced by budding (Shepard & Anderson 1964).

Anatomy

Site:

It is situated in front and sides of the lower part of the neck opposite the 5th, 6th, and 7th cervical vertebrae (Gray's Anatomy 1973).

It clasps the upper part of traches and extends for some distance, on each sides of larynx (Desmet (1960).).

Weight:

The average normal weight of the adult thyroid in non goiterous area is 20-40 grams (Taylor 1952).

Parts of the gland:

It is compesed of two lateral lobes connected to each other by an isthmus near the lower ends.

Each lobe is conical in shape with rounded apex upwards having three surfaces, large convex lateral surface, medial concave surface , and small flat posterior surface. (Bevelander and Ramaley (1974).).

The isthmus is abscent in about 3-6% of cases (DeSmet, 1960).

There is a pyramidal lobe in 50% of the thyroid glands (Khavin and Nikolayov,(1962).).

Blood Supply:

The arterial blood supply of the thyroid gland is very rich, four to six ml. of blood traverse the gland per gram tissue per minute. Each thyroid lobule has its own arteriole, and these lobular vessels anastomose with each other. They divided into capillaries and capillary network surrounding each follicle.(Incheu (1966).).

Emerging vessels form a plexus on the surface of thyroid from which three pairs of veins originate.(James (1958), Gray's (1973).).

Lymphatic Drainage:

Surrounding the arterioles, the lynyhatics run in the lobular connective tissue, comunicating with a network in the capsule of the gland, they may contain colloid material. They end in the deep lymph vessels of the neck (Gray's (1973).).

Nerve Supply:

Thyroid gland has a rich sympathetic and parasympathetic nerve fibres. (Khavin and Nikolayov 1962).

They mainly affect the blood flow.(Rakhawy (1970).).

Histology

The essential unit of the thyroid gland is the follicle, which varies much in size around an average diameter 200 microns. (Bevelander and Ramaley (1974).).

The follicle is a closed sac lined by epithelium: the hight of the cells (3 to 20 μ) is proportional to their secretory activity. (Abo-El Naga (1967).).

The follicle contains viscous colloid material which gives a strongly positive periodic-acid Schiff reaction. In active follicles, the colloid is weakly eosinophilic, in older ones it is strongly consinophilic.(Meissner (1971).).

Each follicle is surrounded by a network of capillaries. In addition each follicle is surrounded by a basement membrane of its own (Nadler (1976).).

Groups of twenty to forty follicles, bounded together by fine connective tissue and supplied by a single arterial twig, constitute the thyroid lobule.(Ingber and Woeber (1968).).

Another type of epithelial cells are seen in human thyroid with difficulty, which are named para follicular cells (light cells, clear cells or "C" cells).They have also been found in the parathyroid and thymus.

They are larger than the follicular cells, have a watery cytoplasm and many secretory granules. (Gray's anatomy (1973), Bevelander and Ramaly (1974).).

There is a connective tissue stroma containing blood vessels, nerves and lymphatics. Lymphyocytes are present in a diffuse manner (Boyd (1970)) and may be in foci in 10% (Rice 1938).

Physiology of the Thyroid Gland

Thyroid secretion is necessary for promating the mental, physical, and sexual development, it also regulates the body metabolism (Keele and Neil (1972),) .

It secretes thyroxin (T_4) and triiodothyronine (T_3) by the follicular cells as stated by Tong (1964). It also secretes thyrocalcitonin by the para folicular cells which has a hypo-calcaemic action as mentioned by Coppe et al (1962), Carr (1965). and Kell and Neil (1972).

The thyroid activity is controlled by the thyrotropic hormone (T.S.H) of anterior pitutary which is inturn regulated by feed back inhipation by circulating level of thyroid hormones (Hoskins (1949).).

T.S.H is elaborated by the anterior pitutary in response to thyrotropin releasing factor produced by the hipothalamus and passes to anteriour pitulary through adeno-hypophyseal axis.

It stimulates both synthesis and release of T.S.H (Williams (1962), Keel and Neil (1972), and Robbin (1974).).

Pitt-River and Tatta (1959), Murray (1963) and Boyd (1970) mantioned that five main events occur within the gland: traping of I_2, T.S.H sets or springs the trap; oxidation of I_2 to organic ioidides by peroxidase enzyme system; Synthesis of the hormones as thryoglobulin in the thyroid follicles; discharge of the hormones to the circulation.

Ghalionġi and Ghareab (1963) stated that physiological increase in size and activity of the gland occurs during puberty, pregnancy, lactation and psychiatric stress.

Conganital Anomalis

(1) Agenesis of the thyroid gland:

It is a very rare condition. (Boyd (1970).).

(2) Thyroglossal Cyst:

Persistant remenants of thyroglossal duct may develop into a cyst lying any-where in its course from the foramen caeum of the tonge to below the hyoid bone. The commenest site is in the midline in the region of the hyoid bone. The contents may be clear or mucoid. Sometimes they are cloudy with cholesterol crystals. The lining cells are epidermoid, columnar , sometime ciliated, or cubical. Mucous glands, lymyhoid tissue, and thyroid follicles may be present in the wall. (Doniach (1966).).

(3) Aberrant thyroid tissue:

This may be found anywhere along the course of the thyroglossal tract (Domiach (1966).). The suprahyoid region is the commenest site (Robbin (1974).

It may develop behind the sternomastoid muscle, detaching from the thyroid gland proper (Elwi (1970).).

Such ectopic thyroid tissue may be the only source of