IMMUNOFLUORESCENT STUDY OF GASTRIC MUCOSA IN MYXOEDEMA

THESIS
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By
Eehab H.N. Allam
(M.B.,B.Ch.)

Supervisors
Prof. Dr. Soheir S. Sheir F.R.C.P.E.
Professor of Internal Medicine, and
Head of the Dept. of Internal Medicine

Prof. Dr. Moatasem S. Amer M.D.
Professor of Internal Medicine

Prof. Dr. Samia M. Ammar M.D.
Professor of Pathology

Dr. Mohamed A.M. Makhlouf M.D.
Lecturer of Internal Medicine

FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY
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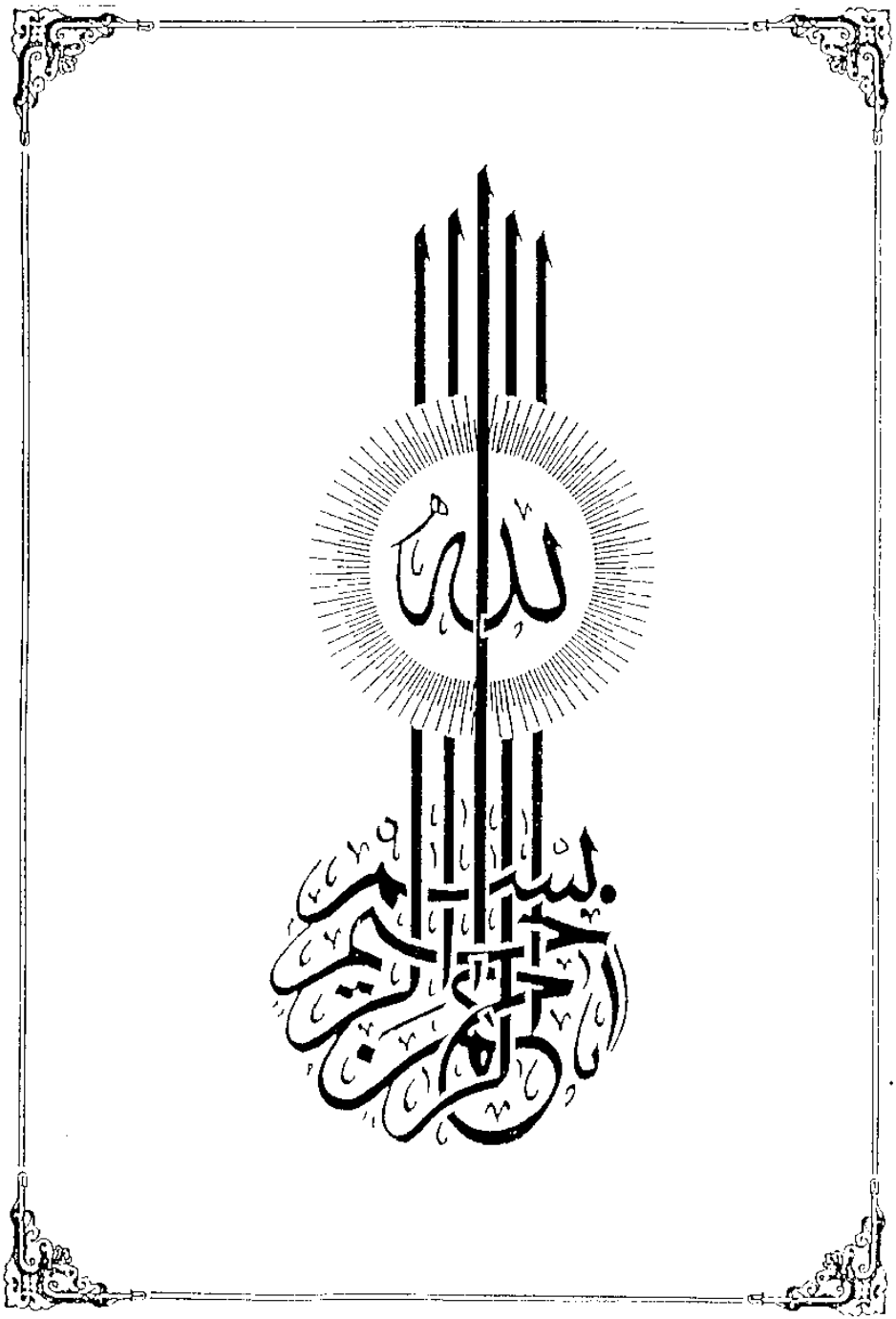

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Myxoedema is a syndrome with various auto-immune disorders, among which are atrophic gastritis and pernicious anaemia (Doniach and Roitt, 1964).

Immunoglobulins are nowadays known to be present throughout the gastrointestinal tract in different proportions. Sheir et al. (1990, 1992), found significant changes in immunoglobulins in the gastric mucosa in diabetis (Sheir et al., 1990) and in thyrotoxicosis (Sheir et al., 1992). Circulating antibodies to gastric parietal cells (parietal cell antibodies, PCA) were found in 20-30% of patients with auto-immune endocrinopathies, such as Hashimato's thyroiditis, idiopathic myxoedema and Graves' disease (Irvine et al., 1965; Schiller et al., 1967; Irvine, 1975; Doniach et al., 1982).

The aim of this work is to study any changes which may occur in immunoglobulins in the gastric mucosa in

myxoedema patients, and which may suggest a role for immune mechanisms in producing gastric manifestations in myxoedema patients.

REVIEW OF LITERATURE

ANATOMY OF THE THYROID GLAND

The thyroid gland is a butterfly-shaped ductless gland situated in the anterior part of the neck. It consists of two symmetrical lobes united in front of the second, third and fourth tracheal rings by an isthmus of gland tissue. Each lobe is pear-shaped and is composed of a narrow upper pole and a broader lower pole. The gland lies at the sides of the larynx and trachea, deep to the sternothyroid, sternohyoid and superior belly of omohyoid muscles. The upper pole of the gland lies tucked away beneath the upper end of the sternothyroid muscle, and between this muscle 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 thyroid gland is enveloped by two capsules;

a. A thick filrous capsule which sends septa into the gland substance to produce an irregular and incomplete pseudolobulation. The parathyroid glands are situated on the posterior surface of each lobe, embedded in the posterior wall of the fibrous capsule.

b. A sheath from the pretracheal fascia; this sheath is attached to the larynx (thyroid and cricoid cartilages). As a result, the thyroid gland moves up and down with the larynx during swallowing.

The isthmus joins the anterior surface of the two lobes towards their lower poles. The posterior surface of the isthmus is firmly adherent to the second, third and fourth rings of the trachea with the pretracheal fascia fixed between them.

The pyramidal lobe is a triangular mass of thyroid tissue extending upwards from the isthmus, in front of the thyroid cartilage, usually to the left of the median plane. It may be connected to the hyoid bone by a fibromuscular band called levator glandulae thyroidae; it is the remnant of the thyroglossal duct and can be demonstrated in about 80% of patients.

The accessory thyroid glands are separate masses of thyroid tissue. They are not uncommonly found near the

thyroid cartilage, in the tongue, in the superior mediastinum or beneath the sternomastoid muscle.

The thyroid gland has an abundant blood supply with a normal flow rate about 5 ml./gm/min. The four major arteries are the paired superior thyroid arteries which arise from the external carotid arteries, and the paired inferior thyroid arteries which arise from the thyrocervical trunks of the subclavian arteries. A fifth artery, thyroidea ima artery, when present, may arise from the arch of the aorta or brachiocephalic trunk (innominate artery).

A venous plexus is present under the capsule and contributes to the right and left superior thyroid veins at the upper pole, and right and left middle thyroid veins. These veins drain into the internal jugular vein on the corresponding side. Occasionally, a single inferior thyroid vein arises from the lower border of the isthmus and descends in front of the trachea to drain into the left innominate vein.

The thyroid gland has excellent blood flow, in the range of 4-6 ml. per gram per minute, or approximately 50 times as much blood per gram as in the body as a whole (Harrison, 1981).

Lymph vessels from the thyroid gland end in the deep cervical lymph nodes, while few vessels pass downwards to end in the paratracheal lymph nodes.

The thyroid gland receives innervation from the sympathetic and parasympathetic divisions of the autonomic nervous system. the sympathetic fibres arise from the cervical ganglia and reach the gland along the blood vessels, while the parasympathetic fibres are derived from the vagus nerve and reach the gland via branches of the laryngeal nerves (Last, 1984).

Microscopically, the thyroid gland is composed of follicles or acini. The follicles are rounded and surrounded by a capillary network. Normally, the follicle walls are formed of cuboidal epithelium.

The lumena of the follicles are filled with a proteinaceous material termed colloid which contains a protein peculiar to the thyroid; thyroglobulin. the thyroid gland contains a second population of cells; the C-cells which are the source of calcitonin.

Embryologically, the thyroid gland appears about the third weak, when the embryo is only 3.5 to 4.0 mm. long. It begins as a proliferation of epithelial cells in the floor of the primitive pharynx, at a point indicated by the foramen caecum which is a dimple-like depression at the base of the tongue. As the thyroid primordium descends in front of the neck, it acquires mesodermal contribution which will give rise to the parafollicular C-cells that secrete calcitonin.

The thyroid then emerges as a bilobed diverticulum connected to the pharyngeal floor by the thyroglossal duct which is usually obliterated. With further descent, the thyroid gland eventually reaches its definitive location in front of the hyoid bone and laryngeal cartilages and assumes its fully developed configuration

of two lateral lobes joined by a median isthmus. At the end of the third month of foetal life, follicles containing colloid become visible, and it is probable that the gland begins to release thyroid hormone at this time, with definite appearance of T4 in the gland by 10-11 weeks.

The placenta is impereable to T3 and T4 and the foetus depends on its own thyroid gland for its supply of these hormones. The adult weight of the thyroid gland (15-20 gms) is reached at about the age of 15.

Aberrant thyroid tissue may be found in the sublingual region, or in the anterior mediastinum producing substernal goitre. This can be confirmed by iodine 131 scan (Harrison, 1981 and Larsen, 1988).

Physiology of the thyroid gland

The principal hormones secreted by the thyroid gland are thyroxine (T4) and tri-iodothyronine (T3). Tri-iodothyronine (T3) is also formed in the peripheral tissues by deiodination of thyroxine (T4). Both hormones are iodine containing amino acids. Small amount of reverse tri-iodothyromine (3,3',5' tri-iodothyronine, RT3), mono-iodothyronine (MIT) and di-iodothyronine (DIT) are also found in the thyroid venous blood (Ganong, 1989).