THE RELATION OF THE TONSIL TO THYROID DISEASE.*

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The interest of the laryngologist in the manifestations of thyroid disease and the various disturbances of the ductless glands may be active from many lines of scientific investigation.

The literature of the subject is particularly voluminous in the fields of physiology, pathology and medical research, yet comparatively few reports have appeared from our own special realm of study.

It is true that in most communities the internist, the surgeon, the neurologist, and the ophthalmologist diagnose and treat these patients without special or expert examination of the upper respiratory tract. The fault is no doubt ours, that we fail to find symptoms and lesions of sufficient interest to prove our value in the case.

It is a well-known fact that the State of Michigan, for some mysterious reason, is a geographic belt that includes an increased percentage of cases exhibiting disturbances of thyroid secretion.

The phenomena of symptomatology are so varied and extensive that the majority of specialties may classify these cases within their selected sphere, but in my experience the laryngologist is consulted frequently to explain and relieve the early neuroses and various symptoms of thyroid disturbance that are referred to the throat. The onsetting stage of atypical hypo- or hyper-thyroidism is usually overlooked or passed into that graveyard of diagnoses, *neuresthenia*, *indigestion*, "a run down condition," or *catarrh*.

Although our wealth of experimental research has brought out comparatively few physiologic and pathologic facts, yet many of these are sufficiently definite to establish scientific diagnosis and therapy of genuine value.

It is reasonably certain that the thyroid pours into the lymph and blood streams a secretion of the greatest importance to organs and tissues of the upper respiratory tract. It is particularly the function of the thyroid to form a secretion whose physiologic activity is dependent on an iodized protein which is proportionate approximately to its iodine content. To utilize it is not to destroy it but it is re-absorbed by the thyroid in a process of auto-activity.

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In the state of insufficient iodine feeding the simple goiter is produced as a compensatory hypertrophy. We are familiar with the increased consumption of oxygen in thyroid or adrenal feeding and the effects upon the heat centers and metabolism. The average amount of iodine in the normal thyroid is estimated at 3 mg per gram of gland substance. It is manifestly obvious that the physiology of the thyroid and other ductless glands is profoundly affected by toxic disturbances in general and particularly by those that enter by the lymphoid ring.

It is especially our function as laryngologists to realize the direct and definite physiologic and pathologic relation of the tonsils to the thyroid and to establish a routine investigation of the effects of tonsillitis, quinsy and other infections of lymphoid tissue upon the upper respiratory tract. My attention was called to this subject by the beneficial results of a series of tonsillectomies for the relief of recurrent tonsillitis and quinsy attended by incipient typical and atypical Graves' disease. The prompt, permanent and prophylactic value of enucleation in this class of cases adds another definite indication to surgical procedure which is given no attention in the literature. As acute and chronic tonsillitis and peritonsillar abscess are recognized as important etiologic factors in incipient exophthalmic goiter, tonsillectomy may be classified then as a prophylactic measure in our new and fashionable department of preventive laryngology.

While it is the purpose of this paper to limit a discussion to the thyroid gland and its relations to the upper respiratory tract a fascinating and scientific field of research is developing in contributions to the inter-relation of the tonsils with the adrenals, pituitary body, thymus and ductless gland system in general.

The diagnostic signs of differentiation according to the degree of hyper- or hypo-thyroidism established have been definitely classified by Beebe and Rogers as follows:

HYPERTHYROIDISM: More common in young women from 18 to 30 years. *Onset* may be slow and gradual or sudden and acute. *Tachycardia*, 128-180; pounding beat felt over a wide area; often a loud systolic murmur over apex, base and along the great vessels. Irregular form, and very susceptible to the effects of exercise. Blood pressure variable, generally low, pulse soft and full, marked dyspnea on slight exertion. Marked edema of legs. *Nervous system.* Fine tremor affecting nearly all the muscles, twitching and occasionally spasms. Patients are abnormally irritable and excitable, apprehensive, mentally very active and physically restless. Muscular

weakness prominent. *Eye signs.* Exophthalmos generally present, although it is not invariable. Occasionally unilateral, corresponding to the side having the enlarged thyroid lobe. Various symptoms arise in consequence of the exophthalmos. No pupillary changes. *Gland.* Enlargement varies from nothing to very large goiter. The blood vessels over the gland are generally much enlarged and pulsate markedly. Right lobe generally the larger. *Nutrition,* severely disturbed; in most cases there is a loss in weight which may progress to extreme emaciation. Appetite variable; vomiting and diarrhea frequent complications. Patients drink a great deal of water. *Skin.* Profuse perspiration, erythema, urticaria, dermatographia; pigmentation, which may occasionally be so marked as to suggest Addison's disease. Hair falls out, but is not coarse and dry. Patients prefer thin clothing and cold rooms. They are more comfortable during cold weather. *Temperature* may be only slightly elevated, 99°-100°. In severe acute cases it runs often to 102°-104°. *Urinary findings.* In most cases normal in volume; glycosuria not unusual; polyuria often observed in later stages. Nitrogen proportions show a very much decreased creatinin excretion, while creatin is present in large amounts. Nitrogen is marked during the period of emaciation. *Blood.* Hemoglobin low. Leucopenia in severe cases, with a marked relative lymphocytosis. *Menses* very irregular or completely suppressed.

HYPOTHYROIDISM more common in advancing years from 35 to 50. *Onset* slow and gradual, in many cases engrafted on an old Graves' disease. *Heart,* rarely above 100, may be irregular with heaving impulse. Pulse generally shows high tension and the blood pressure is above normal. *Nervous system.* Patient may have some tremor and muscular weakness is likely to be very pronounced, but there is not the same restlessness and jactitation. Patients are occasionally irritable, but they are generally dull and apathetic; mentally slow; memory defective. Pains in joints frequent, and referred to as rheumatism; there is a marked tendency toward sudden giving way of the legs when walking. *Eye signs.* Exophthalmos is unusual, although it may have been present at one time. *Gland.* Often no enlargement can be made out; when there is a goiter it has an elastic, rubber-like consistence, occasionally cystic and nodular, but very distinctly different from the active pulsating gland of Graves' disease. *Nutrition,* generally not seriously disturbed; patients hold their weight and in most cases gain slowly; constipation rather than diarrhea, and flatulency a troublesome habit. Patients do not drink much water. *Skin,* dry, may be scaly; patients do not

perspire on exertion; hair and nails dry, brittle, and scalp scaly. Pigmentation not common. Patients prefer thick, warm clothing and are cold most of the time. Much more comfortable during hot weather. *Temperature*, subnormal, may reach as low as 95°. *Urinary findings*. Albuminuria is not unusual. Nitrogen proportions do not show so marked a disturbance in creatinin and creatin ratios. In large number of cases urine practically normal. *Blood*. Hemoglobin low, white blood count normal. *Menses* generally regular but scanty.

While the degree of hyperfunction is in no relation necessarily to the size of the thyroid it is interesting to note that the family tendency as brought out in the hereditary story of thyroid, cardiac or nervous disease is frequently of important influence.

The history of infection, shock, fright, overwork, great fatigue, mental strain, worry, or accident, will often mark the onset of an atypical or severe exophthalmic goiter.

As laryngologists, we are ever alert to the influence of systemic disease upon the structures within our chosen fields of observation, yet we are prone in the hurry of routine office work to thrust aside deeper investigation. The unstable vaso-motor nervous system, gout, rheumatism, neurasthenia and auto-intoxication, especially render the subject liable to annoying symptoms in the nose, throat or ears.

Some of these cases may be classified and identified as thyro-parathyroid insufficiency and appropriate treatment given with relief. We recognize marked cases of cretinism, infantilism and exophthalmic goiter or senility for example without difficulty, but the considerable number of atypical forms of disease of the ductless glands with perverted secretions and attending pathologic change and discomfort pass frequently without further investigation.

The effects of thyroid toxemia and deficiency upon the nervous, muscular and cardio-vascular system are so serious that we may find special and early symptoms in the upper respiratory tract.

When the routine examination of the nose, throat and ears includes the cervical, post-cervical glands, thyroid, and thymus, it may be possible to abort an incipient case of Graves' disease or of pulmonary tuberculosis. These conditions are frequently associated with low resistance to infection.

Our observation may include the size of the hypertrophy, consistence, shape, one or both lobes, diameter of the neck, pulsation, or bruit. We may verify our suspicions before referring the case

to the internist for diagnosis. The pulse will be observed as to rate, quality, arterial tension and effect of exercise. The nervous symptoms especially are those of tremor, twitching, jactitation, insomnia, dreams or disturbed mental condition. We may also find dry or moist skin, dry, dead or falling hair, brittle nails, pigmentation, eruptions, dermatographia, dyspnea, fatigue, nausea, temperature.

Again we may return to the symptoms and signs in detail as observed in our special field.

In moderate or severe thyroid insufficiency we may find a dry mouth and throat increased with excessive dyspnea on exertion; voice, husky or thick; muscles of throat tire more easily; defects or changes in speech. The mucous membrane of the lips, mouth, tongue, pharynx or larynx may be swollen and dry. The laryngeal muscles may show insufficiency.

Matthews has reported 289 cases of laryngeal paralysis in one thousand cases of goiter, seventeen of which were bilateral. In my experience, a number of cases have exhibited slight motor insufficiency according to the size of the goiter and the varying degrees of pressure. It would seem to me that as many of these cases have passing insufficiency it is scarcely tenable to term this condition laryngeal paralysis. It is quite remarkable that a change in voice is not necessarily in proportion to the degree of insufficiency.

Perversion of taste may occur. Howard observed six with abnormal taste in a series of thirty-two cases. Hume and Prudden report as high as one-third abnormal after a careful testing of the sense of taste. These occur usually in hypo-thyroidism.

In Graves' disease, taste, smell and hearing are rarely affected. In severe deficiency of thyroid secretion, hemorrhages from the nose, throat or gums are common. The amount of dyspnea may simulate cardiac or pulmonary disease of severe type. This modification of the oxygen supply due to the adrenal insufficiency may bring about a marked effect upon the hair, nails and skin.

Dyspnea in hyper-thyroidism occurs after damage to the heart muscle has occurred. In myxedema, we occasionally observe an infiltration of the nasal mucous membrane followed by thickening and occasional obstruction by a gelatinous, waxy or yellowish secretion. This may be attended by symptoms of a cramped and swollen feeling in the throat. Pharynx and larynx may assume a bluish tinge or earlier a pale, yellowish color. Angio-neurotic phenomena occur with relaxed or elongated conditions of the uvula. The inter-arytenoid fold may be transparent.

The dry and husky throat of Graves' disease may be attended by symptoms of cough, temperature, unilateral bruit, loss of weight, pre-cordial pain, apprehension, and anemia which may lead to a suspicion of mistaken diagnosis of pulmonary tuberculosis, and call in proper differentiation. In Graves' disease, hyperemia of the pharyngeal, bronchial and pulmonary mucosa is common.

The thyroid gland under hyper-function is often hard, and in this condition gives rise to greater pressure, which is frequently the exciting cause of tracheal cough. This may be modified by change of position and improve with a softer consistency of the gland. Some of these cases exhibited periodicity in their intervals of exacerbation and quiescence.

The abnormal psychic condition of the individual upon his discovery of an enlarged thyroid gland immediately assumes a serious phase of apprehension unless he is managed with great care and foresight.

As apprehension is one of the predominating symptoms it is often possible, without very great care, to alarm these individuals and produce a serious hypochondriacal condition.

In considering the therapy of thyroid disease in general, it is understood that the great majority of drugs are entirely useless except when occasionally indicated for the control of special symptoms. An enormous number of therapeutic measures have received the endorsement of many splendid physicians. It is, therefore, a question of serious consideration to know what we can do for these patients that offers something of value.

The therapeutic measures which we adopt at the present time are those selected by elimination after a study of these individuals for many years. Rest and often a change of environment are absolutely essential to the ultimate control of thyroid disease. Psychic control and management together with sedative therapeutic suggestion is of untold value. The question of success in the treatment and recovery of incipient exophthalmic goiter will frequently depend upon these two essentials.

In myxedema and particularly in the atypical forms, great relief and permanent improvement is usually attained by a careful plan of administration of thyroid extract and iodine in carefully selected dosage of carefully selected preparations. The action of the thyroid protein is specific and within the realm of prompt observation. The secretions of the myxedematous throat and nasal passages become greatly improved, and the combination of the thyroid proteids of Rogers, the proteids of pancreas or adrenals and iodine will

frequently bring about striking improvement. Proper use of the galvanic cautery—the anode electrode applied along the cervical, sympathetic and the cathode applied to the neck, with a one miliam-pere current gradually increased—is often attended by an improvement in the consistency and size of the thyroid.

Operative interference, either ligation or enucleation, should not be postponed in cases where medical treatment does not show improvement after a reasonable time. The results depend greatly upon the skill of the surgeon, as a number of serious results may testify. The use of hypodermic iodin or the green citrate of iron is often of great service in rendering the vaso-motor system more stable. Many cases of the myxedematous type improve greatly under the administration of pure iodin. The study of the individual cases alone can definitely determine this problem.

The internal secretions and their relations to pathogenesis, physiology, and therapeutics deserve our most serious study. The role which they assume as oxygen carriers and active principles of stimulation to the blood cells of the body deserve our interest. Their role as immunizing and sensatizing functions is worthy of increased scientific interest. Their influence as governors over the vaso-motor centers and regulators of harmony in the functions of the lymphoid tissue of the throat is indeed significant.

We are unable as specialists to unravel many of these great mysteries of bio-chemistry. We must call upon our laboratory colleagues with the spirit of research and untiring devotion to scientific investigation to solve these problems for us. Individually we can offer only our clinical mite. Yet it would seem that the laryngologist and otologist has sufficient interest in the newer fields of organo-therapy and pathology of the ductless glands to demonstrate that the thyroid and the tonsillar ring are involved in such a delicate and complex inter-relationship that our special opinion in this field of research may, we hope, soon prove sufficient to call the attention of the internist, the neurologist, and the general surgeon to the fact that an examination of the nose, throat, ears and larynx is at least in all modesty worth the effort.

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