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NOTES ON THE CLASSIFICATION, DIAGNOSIS AND TREATMENT OF THE STAGES OF CHRONIC NASAL INFLAMMATION.[1]

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I PROPOSE to ask attention to a classification of chronic nasal inflammation, which is based on personal anatomical investigation and clinical experience, and which, I venture to think, will prove of practical value in the diagnosis and rational treatment of this affection.

The leading anatomical characteristic of chronic nasal inflammation resides in certain changes which the erectile bodies undergo. In the earlier stages of catarrhal inflammation there exists a peculiar excitability of these structures which causes sudden obstruction of one or both nostrils; later on is found a permanent swollen or puffy (dilated) condition of the erectile tissue, due to a subparalytic state of the intercellular walls with consequent dilatation of the

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erectile spaces. As the disease advances, there is a metamorphosis of the intercellular walls into dense fibrous tissue, which in contracting gradually obliterates these spaces, and causes finally atrophy of the erectile bodies.[1]

These changes in the erectile structures furnish the anatomical ground for the classification which I present for your consideration.

Classification of the Stages of Chronic Nasal Inflammation.

I. Simple Inflammatory (Rhinitis Simplex); divisible into periods of—

α. Irritability of erectile tissue.

β. Permanent dilatation of erectile tissue.

II. Hypertrophic (Rhinitis Hypertrophica); divisible into periods of—

α. Dilatation with hypertrophy.

β. Complete hypertrophy.

III. Atrophic (Rhinitis Cirrhotica); divisible in periods of—

α. Commencing atrophy.

β. Complete atrophy.

I. The first or *simple inflammatory stage* consists of two periods, the one characterized by *abnormal irritability* of the cavernous tissue, the other by *permanent dilatation* of the same.

[1] For further particulars concerning these changes, see article by the writer in The Medical News of Oct. 4, 1884, entitled, "Some Notes on the Pathology of Intranasal Inflammation."

a. Period of irritability: Characterized by increased irritability of the mucous surfaces, expressing itself chiefly in abnormal excitability of the erectile tissue, leading to sudden obstruction of one or both nostrils in the presence of changeable atmospheric conditions, when the individual assumes the recumbent position, as at night, or when under the influence of certain forms of excitement, and in some women at the menstrual period; in fine, when the individual is exposed to any of the exciting causes of coryza.

β. Period of dilatation or permanent puffiness of the erectile tissues (chronic coryza). As the result of the repeated erection of the cavernous tissues which occurs in the first stage, a paralytic or subparalytic state of the resilient and contractile elements of the walls of the erectile cells develops, leading to their permanent dilatation, recognizable by the eye as an engorged or *puffy* condition of the turbinated tissues, which may be distinguished from true hypertrophy by its collapsing under the probe, by the readiness with which it can be pressed against the external wall of the nostril, and by its diminution in bulk under various measures which produce reflex contraction, or emptying or depletion of the erectile spaces, such as the sudden application of cold, the use of cocaine, etc.

It is this subparalytic condition of the tissue, represented by the puffy character of the swelling, which is the *connecting link between the simple and hypertrophic stages.*

II. *The second or hypertrophic stage* is divisible into two periods, characterized respectively by *hypertrophy with dilatation,* and by *complete hypertrophy.*

α. *Period of hypertrophy with dilatation:* Characterized by commencing hypertrophy of intercellular connective-tissue walls of the erectile bodies with uniform puffiness of the tissue not especially involved in the fibrous process.

β. *Period of complete hypertrophy:* Characterized by more or less complete conversion of the affected portion of the tissue into a fibrous mass; swelling generally uniform, unyielding. This complete hypertrophy is most commonly met with on the posterior extremity of the inferior turbinated body, while its anterior extremity is generally puffy, dilated, doubtless from *collateral engorgement.*

III. *The third or atrophic stage* is separable into two periods, one of *commencing atrophy* and one of *complete disappearance of the erectile tissue.*

α. *Period of commencing atrophy:* Characterized by pronounced contraction of the newly formed fibrous bands, leading to irregular, nodular condition of the tissue more prominent in the posterior part of the inferior turbinated body and along its inferior border. This uneven appearance of the diseased portion not infrequently assumes the appearance of fibrous or papillomatous excrescences which may become detached, the process of detachment constituting one step in the future and complete atrophy of the tissue. The erectile spaces are inconspicuous and, in some places, entirely gone.

β. *Period of complete atrophy (turbinated cirrhosis):* Characterized by a rudimentary condition of the turbinated bodies, due to more or less complete disappearance of the erectile tissue.

II. In the natural state, the lumen of the nostril, or that space which exists between the turbinated bodies and the septum, is indicated by a slit, narrow and pointed above, and broader and more triangular below, which may be roughly compared to the slit in the sounding-board of a violin. When the turbinated tissues are made to contract artificially, obliteration of this slit occurs, the middle and inferior meatuses are represented by a broader, more pyramidal passage, and the middle and deeper portions of the nostrils come into view. The opening of the posterior nares into the retro-nasal cavity is then seen as a dark, clearly cut perpendicular line. In some persons, especially in those whose nasal chambers are naturally capacious, this linear opening may be seen without artificial contraction of the turbinated bodies.

The position of the turbinated bodies also varies within certain limits in the normal condition. When the inferior turbinated bone is "depressed," its anterior end appears as a rounded or, in some instances, bluntly pointed protuberance jutting out from the external anterior wall of the nostril, and closely in contact with the floor of the inferior meatus, from which it seemingly springs. When the bone is "elevated," there is a distinct, sometimes very broad, space between its inferior border and the nasal floor, the curve and dip of its anterior extremity is generally well defined, so that a *comma-shaped space* is left between it and the external wall. The inferior surface of the bone is not visible except in cases in which the long axis of the bone is directed

upward and forward.[1] In some families, the inferior turbinated bone of one side is unusually developed without giving rise to serious inconvenience,[2] a fact which it is well to bear in mind in coming to a conclusion in diagnosis.

The rounded, bulging middle turbinated bone occupies the upper and outer portion of the anterior rhinoscopic picture. In the anterior portion of the nostril the space between it and the inferior varies greatly within the limits of health. Usually it presents a more or less pear, or inverted, comma-shaped appearance, with or without a comma-shaped space between it and the outer nasal wall.

It is only in very exceptional cases that the superior bone can be seen.

In the posterior rhinoscopic image the floor of the nostril is not visible in health, being hidden by the bulge of the palatal muscles, and the inferior edge of the lower turbinated bone is only visible in exceptional cases of the "elevated" form. Generally only the upper portion of its posterior extremity is visible. The posterior border of the septum is almost invariably straight, but just anterior to it, and within the nostril there is a slight bulging or cushion which represents the cavernous body located there.

The middle turbinated body generally projects inward as a pear-shaped protuberance, whilst the

[1] In a case suffering from mental disease, I observed the inferior turbinated bone so elevated that it occupied the position usually assumed by the middle, and its obliquity was such that more than half of its inferior surface was distinctly visible.

[2] I have observed this condition twice.

superior is either scarcely visible, or appears as a rudimentary-looking tubercle or projection.

Only a small portion of the inferior meatus is visible as a small, dark, and three-cornered space. That portion of the middle meatus which is included between the turbinated bones is seen in the mirror as either a half moon or imperfectly defined S-shaped slit. The irregular spaces between the bones are continuous with the space common to the three meatuses, and which appears as a dark chamber in the rhinoscopic image.

The color of the mucous membrane in different individuals and in the same individual at different periods varies within the limits of perfect health. It may be said, in general, that it is of a pale reddish hue, more pronounced in the area covered by erectile tissue. In the posterior rhinoscopic picture, the color of the membrane appears of a darker hue, the parts being thrown more or less into shadow.

The mucous membrane is closely adherent to the anterior portion of the septum and walls of the vestibule, whilst over the posterior part of the septum and turbinated bodies it is looser, and separated from the periosteum by the erectile body which becomes a thin layer as the anterior extremity of the bone is reached.

In the anterior portions of the nostril, therefore, the turbinated bodies are more compact and closely adherent than the posterior segments of the nasal chamber.

I have dwelt upon the above anatomical considerations because I have found them invaluable guides in diagnosis. In anterior rhinoscopy the amount of

swelling may be very conveniently measured by the changes in breadth and direction of the S-shaped slit, and the degree of obliteration of the comma-shaped space, whilst the amount of posterior hypertrophy is most accurately determined by the anatomical facts detailed above. The amount of swelling on the septum may also be determined in a similar manner.

The amount of swelling or hypertrophy, and the implication of the bone in the process, may furthermore be measured by the hard and incompressible or the soft yielding character communicated to the finger by the probe, whilst hypertrophy may be differentiated from mere puffiness by the ease with which the erectile bodies may be emptied or compressed by mechanical causes or artificial contraction. In the latter case the rapidity of contraction is often a measure of the amount of mere puffiness. In using cocaine, for example, if the swelling be due to mere puffiness, acute or transitory engorgement, it subsides very rapidly, almost instantly, while if hypertrophy coexists the tissues collapse much more slowly and less completely.

In making the diagnosis of incipient rhinitis, it should be borne in mind[1] that the disease not infrequently has its starting point in the erectile bodies, and occasionally in the periosteum. In such cases, the first evidence of its existence is a more or less engorged state of the area occupied by cavernous tissue. A stimulus, too, which in the normal state would exert little or no impression, is usually sufficient

[1] See article referred to above.

to provoke more or less erection of this tissue with, it may be, the evolution of reflex phenomena. In all cases the cavernous structure becomes sooner or later involved. Abnormal irritability of the area covered by this tissue, with slight puffiness of the same, are, therefore, invaluable guides in the early recognition of chronic intranasal inflammation. It should be borne in mind, at the same time, that this condition of the erectile bodies is not always the forerunner of rhinitis, but may be due to other and physiological causes. The swelling of the mucus membrane of the vestibule and anterior portion of the septum (cartilaginous septum) is always inconsiderable, except in the latter portion of the hypertrophic stage, when it is often excessive.

In their perfect physiological condition, the nasal passages are moistened by a scarcely perceptible halitus which varies in amount according to the condition of the surrounding atmosphere and other external and internal causes. The existence of mucus must be regarded as pathological, and therefore incompatible with a perfectly healthy condition of the nasal passages. While the secretion of mucus may be due to temporary causes (local or systemic irritation), it is always present in greater or less amount in the earlier stages of rhinitis. The more or less constant presence of mucous secretion within the nostril is therefore indicative of commencing inflammation.

III. *General Rules of Treatment.*—The general principles governing the rational treatment of the different stages, may be summed up tersely in the following propositions:

In the early part of the first stage, the treatment

is mainly hygienic (hardening the skin, acclimatizing the nasal passages, attention to general health, protection of nasal passages from direct or indirect sources of irritation, removal, if possible, to an equable climate, etc.), and consists in many cases simply in the search for, and removal of, the cause (local or reflex irritation, general systemic disease, vices of constitution from various causes, excesses, surroundings of patient, etc.). At this period local treatment is often unnecessary, and in some cases harmful. In other cases, great benefit is derived from the judicious use of detergent, alterative, and astringent preparations, applied, as far as possible, to the diseased surfaces alone, in the form of solution or mixture with some such substance as cosmoline, glycerine, vaseline, etc., or these substances may be advantageously used unmedicated. In a certain proportion of subjects, the administration of remedies to control reflex excitability of the nerve centres is productive of good.

The treatment of the second period of this stage must be carried out on the same general principles as above. Remembering the condition of the contractile elements of the intercellular walls, measures should be taken to restore their loss of power (strychnia and electricity occasionally useful). Failing in simpler means, resort may be had to the galvanocautery or to electrolysis.

In the above periods, medicines in solid forn (*e. g.*, powders) are absolutely contraindicated, as tending to increase the irritation and to hasten the coming of the hypertrophic stage.

The management of the first period of the hyper-

trophic stage consists in a combination of the above methods. Here surgical procedures are more justifiable. In the second period of this stage, the treatment is essentially surgical, and consists in the removal of the obstruction, in procuring thorough cleanliness of the nasal passages, and attention to the general principles indicated above. Solids are contraindicated. The general treatment of the third stage is tonic and hygienic; the local, is palliative, and consists in keeping the parts scrupulously clean and lubricated.