

connection of its trunk with the *vidian* by the petrosal, the *levator palati*, the *azygos uvulæ* and a few muscles of the neck, and receives sensitive filaments from the fifth.

The fifth nerve, the great cranial nerve of sensation, is divided into three branches. First is the ophthalmic, which supplies the lachrymal gland sac, conjunctiva and ophthalmic ganglion of the sympathetic and nasal branch to *Schneiderian membrane*.

The second division, the superior maxillary, supplies the teeth of the upper jaw and *mucous membrane* of the *antrum maxillare*, and the third division, the inferior maxillary, supplies the external ear and meatus, filaments to anterior two-thirds of tongue, lining of cheek, fauces and lower jaw, integument of chin, lower lip, and lower half of face and muscles of mastication. It is both a sensitive and a motor nerve.

Through the medulla oblongata and spinal cord, irritation of the mucous membrane of the upper air passages is conveyed to the brain, to the arm, forearm and hand by the brachial plexus, to the chest and its contents by the dorsal and sympathetic nerves, to the abdomen and its contents by the lumbar and sympathetic, and to the lower limbs by branches given off from the lower portion of the spinal cord and the sympathetic.

Neuralgia, partial paresis, hyperæsthesia, analgesia of the extremities, epilepsy, chorea, and accompanying chronic naso-pharyngeal catarrh, are readily explained through reflex irritation, and subside when proper treatment is given the catarrh.

The sequels of naso-pharyngeal catarrh are reflex cough, sneezing, stenosis of nasal cavities, ocular catarrh, asthenopia, aural catarrh, headache—either frontal, vertical or occipital—nasal polypi, tonsillitis, enlarged tonsils, hypertrophy of the submaxillary, anterior and posterior cervical glands, patulency of Eustachian tubes, hæmorrhage from the throat—either the naso-pharynx, larynx or trachea—epistaxis, laryngitis, tracheitis, bronchitis, and catarrhal phthisis, neuralgia, or numbness of the limbs or trunk, anæsthesia or hyperæsthesia of the skin, paresis of arm and forearm, dyspepsia, hay fever, irritability, melancholia, partial loss of memory or intellectual faculty, insomnia, frightful dreams, agoraphobia, vertigo, palpitation of the heart, neurasthenia, stammering, suicidal tendency, asthma, chorea, epilepsy, loss of taste, anosmia, anæmia, anorexia, deafness, reflex irritation of the genito-urinary organs, an abundant discharge of nasal mucus or sneezing during coitus, aphonia, erythema and herpes of the nasal integument and lining, tinnitus aurium, otalgia, dysphagia and constipation. In cases of naso-pharyngeal catarrh of long standing there is a tendency to irritation, catarrhal inflammation or debility of all the mucous membranes of the body.

When we consider the pathological elements of the various forms of chronic catarrh, and engrafted upon them, the very frequent or recurrent subacute naso-pharyngitis, with increased dilatation of the blood-vessels, hyperæmia, redness, heat, tumefaction and pain, followed by exudation of liquor sanguinis, diapedesis of the leucocytes, increased infiltration of the connective tissue, cell proliferation and disorganization of lymph; rhinoscopic examination showing a congested, red, dry and swollen appearance of the mucous lining—later on the dryness gives way to moisture and an abundant secretion of mucus or

mucopus, the mucous and submucous tissue is cedematous, infiltrated and thickened, and the glands and follicles are distended and abnormally active; and often added to this, the pressure of a polypus, septal spur, ridge, an exostosis enchondroma, deflected septum and adenoid growth in the vault and fauces causing irritation and pressure symptoms, congestion, and producing irritation and inflammation by continuity, contiguity and reflex imitation in distant organs and nerves; it is very easy to explain why mental aberration should attend long continued disease of the upper air passages, as well as other sequelæ.

About, or less than, a decade ago, the rhinologist was considered to exist only in name—a myth, and not entitled to a foothold in the profession; but to-day, rhinology has become one of the chief corner-stones of the temple of medicine and surgery. It is built on physiological, histological and pathological rocks; upon these we, the rhinologists, have builded our church. The gates of doubt, charlatanism, ridicule and infidelity shall no longer prevail, and now, in this enlightened day, "*he who doubts is damned already*." To the general practitioner we say: Give the stomach, liver, heart and alimentary canal and chest organs a rest, and come up higher and see the light turned on, not through a glass darkly, but see new realms, diseases and pathological lesions, for old things have passed away. Behold a new creation!

To the gynecologists and genito-urinary surgeons the rhinologists are ready to say, Through reflexes and neuroses we meet you, not only halfway, but all the way. The intra-nasal tissue is glandular, erectile, and has various nerves, blood and lymph channels ramifying it like the utero-genital organs, and on proper provocation, sends out reflex irritations and congestions to the spinal cord, brain and other remote organs.

To the alienists we say, Look into the naso-pharyngeal chambers, and often a cause for insanity can be found. To the oculist, aurist, dentist: You must bow in reverence to rhinology, for your work is very often *nil* unless you pay your respects to the rhinologist, for often he only can solve your difficulties, and cure your patients. The more frequently you consult him, the better it will be for humanity. To the surgeon we say: You are indispensable.

The successful rhinologist, like the ideal gynecologist, must, from necessity, be a skilful and conservative surgeon.

Rhinology is a haven in which many "mortals" find rest, ease, surcease of sorrow, health, peace, joy and long life.

INFECTIOUS PSEUDO-MEMBRANOUS FOLLICULOUS TONSILLITIS AND PHARYNGITIS.

Read in the Section of Laryngology and Otology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

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Repeated confirmation of the discovery of the specific bacillus of true diphtheria has stimulated renewed clinical as well as bacteriological study of other pseudo-membranous inflammations of the tonsils, pharynx and nose, so that our literature of the

past few months has contained numerous accounts of "Tonsillitis Lacunaris," "Angina Follicularis," "Pharyngitis Fibrinosa," "Pharyngitis Phlegmonosa," "Rhinitis Membranosa," etc.; a group of diseases which cannot be said to be as yet sufficiently and accurately described, for in some respects they closely resemble diphtheria while in other features they differ widely from that disease.

The opinion of bacteriologists that in these affections diphtheria can only be excluded positively by the absence of the Klebs-Loeffler bacillus, as determined microscopically, is doubtless correct as applied to a few border-line cases, yet one should not permit this fact to engender neglect of macroscopic signs and clinical symptoms upon which a differential diagnosis may also be made, usually with greater promptness, and with reasonable certainty. We are, however, better able to do this now, since we know that in a bacteriological sense, at least concerning diphtheria, there is an exact line of demarkation to be drawn.

Concerning the various forms of folliculous tonsillitis and pharyngitis, bacteriology has not yet taught us so much, but we expect to show, from a clinical standpoint, that at least two of these forms of tonsillitis, are as distinct from each other as they are, on the other hand, from true diphtheria.

The recital of an interesting case in point will make our meaning more explicit.

The patient—one of the most intelligent and popular physicians of Chicago, had been exposed to infection by attendance on a case of so-called scarlatina-diphtheria.

A distinct sense of malaise and hebetude with slight soreness of the throat preceded, for a day or two, a chill, which was followed by a temperature of 104° F. Our first examination was made the following morning: temperature 102° F., pulse 100, skin perspiring, face flushed, mental hebetude, and enlargement of the cervical lymphatic glands. The tonsils were only slightly swollen, but were deeply congested and exhibited a thin, whitish, pseudo-membranous punctated deposit which corresponded with the follicular openings. Behind each tonsil, and separated from it by the posterior pillar, the chain of muco-lymphoid glands which occupies the angles of the pharynx on each side and courses thence upward into the naso-pharynx, had developed into a mass larger than the tonsil itself, and was covered by a similar deposit. Two or three isolated muco-lymphoid glands on the posterior pharyngeal wall likewise presented whitish points. No membrane could be observed at any time on any portion of the pharynx other than as described on the purely glandular parts, but we wish especially to emphasize the aspect of this deposit. It was *not* in "cheesy" pellets which often protrude from the crypts through the follicular orifices and which are composed of fat, epithelial debris, inspissated mucus, etc. It was a veritable pseudo-membrane, thin, gray, translucent and firmly attached to the underlying mucosa. Its punctated appearance around the mouth of each follicle suggested that the larger part of the pseudo-membrane might lay *within* the glandular structure—that the crypts and follicles were likewise lined with it. Here and there two, three or four puncta, from close proximity, ran together forming somewhat larger spots, and an occasional layer of muco-pus if not cleaned away would lend an appearance of still greater extent and uniformity to the pseudo-plague. Nevertheless, as far as concerned the pharynx alone, the absolute limitation of the exudate to the muco-lymphoid glandular structures and its punctated appearance differentiated it from the customary picture of genuine diphtheria, the aspect being plainly that which can best be described under the name of septic or infectious tonsillitis and pharyngitis.

But within the nose the view was somewhat different. After shrinkage of the congested turbinate bodies by cocaine spray and dislodgement of an abundant, viscid secretion, one observed a distinctly pseudo-membranous deposit to cover the vestibule and extend within the right nostril as far as one could see, that is especially over the cartilaginous septum narium and anterior part of the infe-

rior turbinate body. This membrane was *uniformly* distributed over all visible parts in the right naris, but otherwise here also it differed from the ideal diphtheritic deposit, even when observed in the nose, it being thinner and semi-translucent. It had more the aspect of deadened epithelial debris, but was evidently not merely such. The left nostril was less affected. The external nasal appendage was much swollen, painful and of decided erysipelatous hue, the redness, however, being confined, not extending above the bridge of the nose. A good post-rhinoscopic view was not obtainable.

In explanation of this nasal feature of the case time permits us only to state, that non-diphtheritic pseudo-membranous rhinitis is common, that a variety of intra-nasal inflammatory states are accompanied by fibrinous exudates in which the absence of the Klebs-Loeffler bacillus has been repeatedly determined. Other microorganisms usually of the streptococcus or the staphylococcus species are often found and it is probable that infection, either primary or secondary by these microbes may result under favorable conditions in the formation of a pseudo-membrane.

I have only to remind rhinologists of the frequency with which an exudate forms after electrocauterization of the turbinate bodies, and that individuals differ widely in their susceptibility to this formation. In my own experience a pseudo-membranous exudate has followed cauterization much less frequently since I have exercised special care in operating to leave an unbroken eschar, thus serving to prevent secondary infection by microorganisms.

The eyes of our patient were also affected, the right eye very severely, but as stated by Dr. Boerne Bettman, who had charge of these organs, they manifested none other than evidences of severe conjunctivitis.

The patient was confined to the house for two weeks, and suffered from a sense of depression for about two weeks more, when complete recovery ensued without any signs of the diphtheritic sequelæ, paralysis or nephritis. The treatment does not fall within the scope of this paper.

A certain interest attaches to this case by reason of the conjunction of the pseudo-membranous rhinitis with the follicular tonsillitis and pharyngitis, but the pressing question with these two conjoined as with either separately concerns the diagnosis: Is it, or is it not diphtheria? We might regret the absence here of bacteriological investigation, yet such, in part at least, would have defeated the very object of this paper which is to present, in connection with recently acquired knowledge of the bacteriological relationships, such a study of the clinical features that a reasonably certain diagnosis can be made therefrom in the sick room; for I submit that it is there and at once that one needs to answer this question correctly, and that too, in the nature of things most times without the aid of the microscope.

And first, what has bacteriology already taught us as to the identity or non-identity of these processes? It is established that genuine diphtheria is occasioned by the Klebs-Loeffler bacillus. But other microorganisms are capable of exciting pseudo-membranous inflammation of various clinical types which Loeffler is cited as having grouped together under the generic term of pseudo-diphtheria, meaning of course that they are not diphtheritic at all. Clinically they differ from true diphtheria in some one or more particulars—in character of membrane, constitutional symptoms or sequelæ, but resemble it so

closely that until the advent of bacteriological support, we were often unable to state positively that these non-diphtheritic pseudo-membranous cases might not be diphtheria of a mild type. This was often true of folliculous tonsillitis and pharyngitis or "angina follicularis." Investigators have uniformly failed to find the Klebs-Loeffler bacillus in this disease, but have found a variety of other microbes.

Sendtner,¹ of Munich, studied four cases and found the streptococcus pyogenes and streptococcus erysipelas, and recalls in this connection the clinical relationship which has been observed between erysipelas and puerperal fever, and angina follicularis. Barnabei,² of Rome, observed twelve cases which he denominated "primary erysipelatosus angina." They were characterized by redness and swelling of the tonsils and fauces, and from the crypts of the tonsils an exudate soon showed itself in the form of small white points. A microbe, indistinguishable from the streptococcus erysipelas, was present in all cases. Dubler (*Virchow's Archives*, Heft. 3, 1891) also reports two cases of infectious phlegmonous pharyngitis in which both in the pus and in the splenic blood a microbe indistinguishable from the streptococcus of erysipelas, was found.

Rendu,³ reports two cases in which virulent pneumococci were found, in which the angina follicularis was contracted while sleeping among pneumonia patients.

Hajek,⁴ of Vienna, describes four cases of non-diphtheritic "pharyngitis fibrinosa" connected either with the staphylococcus pyogenes aureus or the streptococcus pyogenes, one of which cases supervened upon "tonsillitis lacunaris."

It scarcely suffices, however, to attribute these diseases exclusively to the organisms named, since with the exception, perhaps, of the streptococcus erysipelas, they are all found in the mouth in health,⁵ but in at least some of the cases, it is stated that they were present in unusually large numbers, and that the cultures showed great virulence.

With our patient the infection was with reasonable certainty traceable to a case of "scarlatina-diphtheria," but from a bacteriological standpoint this disease is likewise a false diphtheria, occasioned by microbes other than the Klebs-Loeffler bacillus. Bourges,⁶ of Paris, classifies the anginas of scarlet fever into: 1. Angina erythematosa; 2. Angina pseudo-membranacea, occurring early or late in the disease, circumscribed or diffuse, mild or severe; 3. Angina gangrenosa. He concludes from bacteriological investigation that the erythematous and nearly all the early pseudo-membranous forms as well as many of the late pseudo-membranous cases, are caused by secondary infection with the streptococcus pyogenes which happens usually through the tonsils. Huebner,⁷ of Leipzig, Babes,⁸ of Pest, and Seifert,⁹ of Wurzburg, assert practically the same. This is not assuming, however, that in exceptional instances secondary infection by the Klebs-Loeffler

bacillus might not occur and genuine diphtheria become associated with scarlatina, but the probabilities favor the position that the case by which our patient was infected, was an ordinary streptococcus pseudo-membranous angina.

We have designated our case as "infectious," by which is meant that some distinct species of parasitic organism, having gained access to the affected parts, has there multiplied and acted, both directly and by elaboration of chemical poisons, as the specific cause of the disease. The contagious nature of certain forms of tonsillitis has long been suspected and much evidence thereof has been published by individual observers,⁹ yet the fact has not been generally credited, for the reason that the greater number of cases failed of any such signs, and when evidence of contagiousness was conclusively present the disease would be attributed to the diphtheritic infection or the subject be dismissed as a mere coincidence. We now know that the diphtheritic infection, *i. e.*, the Klebs-Loeffler bacillus, is not present in this disease, but that there are present in the form which we describe under the name of infectious pseudo-membranous tonsillitis, other microorganisms of kinds that establish for it a possible contagious character.

I am sure that clinically, one can distinguish at least, *two* types of acute folliculous tonsillitis and I propose to name them in contradistinction to each other: 1. Simple folliculous tonsillitis, and 2, infectious pseudo-membranous tonsillitis.

With the simple form there may or may not have been previous chronic hypertrophy or inflammation; it is conditioned, if not caused by "taking cold," *i. e.*, by refrigeration of some part of the body surface, which determines vascular engorgement of the tonsils exactly as in another individual it may occasion vascular engorgement of the nasal turbinated bodies. The tonsil swells, the follicular openings are obliterated and the pent up secretion acts as a further irritant. it becomes inspissated and mixed with epithelial debris; it is soon forced out to the surface of the gland in the form of "cheesy" pellets, which are altogether different from a pseudo-membrane. Finally, when the tonsils are free of this accumulated debris, or at times, earlier, if the globules are forcibly dislodged and removed, the tonsillitis rapidly subsides.

The *infectious pseudo-membranous form* we have just described at length in relating our case, and it will again be referred to in the summary.

Now, we note in current literature a disposition to attribute all cases of tonsillitis and pharyngitis to "infection," the truth of which we cannot deny, for pathogenic microorganisms, being everywhere and especially present in the mouth, might readily invade the tonsils at a time when their power of resistance is lessened by vascular engorgement and pent-up secretion, and may even play an important part in the formation of the "cheesy" globules. In simple folliculous tonsillitis, however, such infection would seem more like a secondary than a primary process, for in typical cases the inflammation subsides as soon as the tonsil can be freed of its accumulated inspissated secretion; but "infection," either primary or secondary, affords a ready explanation of cases which deviate from the typical, which are mixed, and in which

¹ Internationales Centralblatt für Laryngologie, Rhinologie, etc., April, 1892, S. 472.

² Internationales Centralblatt für Laryngologie, Rhinologie, Nov., 1891, S. 243.

³ Loc. cit., April, 1892, S. 473, and Nov., 1891, S. 243.

⁴ Internationales Centralblatt für Laryngologie, Rhinologie, etc., April, 1892, S. 475.

⁵ Dittrich-Prager Med. Wochenschrift., No. 38, 1890. Int. Centralblatt für Laryngologie, etc., May, 1891, S. 558.

⁶ Int. Centr. für Laryngol., June, 1891, S. 619.

⁷ Loc. Cit., Nov., 1889, S. 247.

⁸ Loc. Cit., June, 1891 S. 619.

⁹ Dubousquet-Laborde-Bouchard Landowzy, Int. Centr. für Laryngol., etc., Mai, 1892, S. 520.

both "cheesy" and true punctated pseudo-membranous exudate can be discerned.

In summarizing, we will state what are seemingly the logical conclusions of this study:

That we can distinguish at least two forms of acute folliculous tonsillitis.

1. Simple folliculous tonsillitis, which is characterized by congestion and swelling of the tonsils, with protrusion from the narrowed follicular openings of cheesy globules which may simulate a punctated pseudo-membranous exudate, but which is really not such; without evidence of primary parasitic infection as a cause, and therefore not contagious; capable, however, of being transposed into a conglomerate variety of tonsillitis by secondary infection with pathogenic microorganisms; usually not preceded by a distinct chill, and not accompanied by much fever or systemic depression.

2 Infectious pseudo-membranous tonsillitis, which is characterized by deep congestion, but often only by moderate swelling of the tonsils, and by a punctated exudate of pseudo-membrane, the spots of which are in size from 2 to 4 mm. in diameter, and are attached around the follicular openings, presenting the appearance as if the crypts were also lined by the same material; *unlike* the cheesy pellet the exudate is thin, translucent, and so intimately connected to the underlying mucosa that it cannot be detached without bleeding or without force; two or more puncta may join at their borders and form larger spots, but after cleansing away all muco-purulent matter this punctated conformation of even the larger pseudo-membranous areas may be readily discovered. In addition to the tonsils, any or all of the muco-lymphoid glands in the pharynx may be likewise affected, especially the chain of glands located just behind the tonsil and separated from it by the posterior pillar, but the pseudo-membranous exudate is limited absolutely to the glandular structures of the pharynx, although careful cleansing and critical inspection will be required to demonstrate this fact. The cause is infection by any one of several species of pathogenic microorganisms, *e. g.*, streptococcus erysipalatosus, staphylococcus pyogenes aureus, pneumococcus, streptococcus pyogenes, etc., and it is not unlikely that with closer clinical study aided by bacteriological confirmation, we may be able in the future to further subdivide this form of tonsillitis into varieties in accordance with the particular species of microorganism which has acted as the cause. It is infectious or contagious and is known to become endemic. It is often ushered in by a chill, and accompanied by moderate or even high fever. It may be complicated by albuminuria, but is not followed by paralysis. The Klebs-Loeffler bacillus of true diphtheria is never found in this disease. That by attention to these details this form of tonsillitis and pharyngitis, with very few exceptions, may be readily distinguished clinically from true diphtheria, which is characterized not by a thin translucent, punctated exudate, but by thickish, opaque, diffuse plaques of pseudo-membrane which are not limited to the glandular structure, but which, when originating on the tonsil, rapidly embrace as well the pillars of the fauces, and extend to or involve at the same time the posterior pharyngeal wall and velum palati.

NOTE: Since the completion of this paper our attention has been called to an article by Dr. Adolph

Baguinsky, in the *Berliner Klinische Wochenschrift* of February 29, 1892. He examined for bacilli 154 cases, being all that were admitted as diphtheria to the *Kaiser und Kaiserin Friedrich Krankenhaus* during a certain period. They all exhibited "the same naked-eye local changes, *i. e.*, a dirty gray-white to green pseudo-membrane on the mucosa or tonsils." He does not state whether or not cases were included which are ordinarily denominated tonsillitis, and characterized by a *punctated* pseudo-membrane limited to the glandular structures, but one would infer that such were not included among his cases. Of the 154 cases, Klebs-Loeffler bacilli were found in 118, and these were the severe cases. The others contained only cocci and ran a mild course.

Baguinsky concludes that there are two diseases called diphtheria—exhibiting the typical diphtheritic deposit, which can only be distinguished from each other microscopically; a result which is interesting, but not especially pertinent to the subject of our paper, which is tonsillitis. Baguinsky mentions also two cases of "rhinitis fibrinosa" unaccompanied by serious systemic symptoms in which Klebs-Loeffler bacilli were found, and advises caution regarding a non-diphtheritic diagnosis in this disease. The two cases, however, indicate but little, for it is not contended otherwise than that diphtheria, either nasal or pharyngeal, can occur with but slight systemic disturbance.

Closing the discussion, Dr. Casselberry said: I prefaced my paper by stating that "the opinion of bacteriologists that in these affections diphtheria can only be excluded *positively* by the absence of the Klebs-Loeffler bacillus, as determined microscopically, is doubtless correct as applied to a few border line cases." But I have described at length the clinical aspects of these forms of tonsillitis, because I believe it both necessary and possible thus to make a correct diagnosis in the majority of cases. I have been unable to find any record of the presence of Klebs-Loeffler bacilli in cases of apparent tonsillitis in which the pseudo-membrane was of the character which I have described in connection with the infectious form of this disease, *i. e.*, punctated, thin, translucent, and limited to the tonsils and muco-lymphoid glands of the pharynx. The cases cited by Dr. Wright as recorded by Baguinsky and others were nasal cases, evidently nasal diphtheria in which, by reason of the absence of constitutional symptoms, the disease, without microscopic examination, would have been mistaken for non-diphtheritic "rhinitis fibrinosa." As intimated in the paper, it seems to me more difficult to exclude diphtheria in nasal than in pharyngeal cases, although it would seem preposterous to assume even a possible diphtheritic infection as a cause of the many pseudo-membranous deposits which occur after the use of the electrocautery in the treatment of hypertrophy of the turbinates.

At the late meeting of the Virginia State Medical Society, Dr. Landon B. Edwards, the efficient secretary of the society and editor of the *Virginia Medical Monthly*, was unanimously elected an Honorary Fellow of that organization.

THE WARREN TRIENNIAL PRIZE of \$500 has been awarded by the staff of the Massachusetts General Hospital to John Strahan, Belfast, Ireland. Subject "Ricketts."