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NON-DIPHTHERITIC PSEUDO-MEMBRANOUS RHINITIS.*

BY J. PRICE-BROWN, M.D., TORONTO, CANADA.

THIS is a non-specific inflammation of the mucous membrane lining the nasal passages; it may be acute, chronic, or recurrent, and is attended by a deposit of fibrinous exudation. The exudate presents the anatomical features of a false membrane, being imposed upon the epithelium, without involving, to any great extent, the deeper tissues.

That this condition should ever exist as an independent affection is still a matter of doubt with some observers.

Abbott, in the "Transactions of the Pathological Society of London," 1893, says that "cultivations from the supposed false membrane of the nose *always* contained the Klebs-Loeffler bacillus, although in some cases it was thought to be attenuated. Evidence is accumulating to show that these cases of so-called fibrinous rhinitis are merely mild local manifestations of the specific diphtheritic bacillus."

Professor Kanthach, in Albutt's "System of Medicine," 1896, says: "A curious and important pathological condition is the so-called rhinitis fibrinosa. Clinically such cases are not diphtheria; but pathologically and bacteriologically *they are*. In the cases I personally examined, I obtained, as others did, large numbers of virulent diphtheria bacilli."

* Read before the Western Section of the American Laryngological, Rhinological, and Otological Society, at San Francisco, California, March 31, 1899.

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Musser, "Medical Diagnosis," 1896, says that, in the diphtheritic form of acute rhinitis, the diagnostic symptom is the presence of false membrane in the nose. He says the nasal discharge is very acrid in diphtheria, and is almost sure to cause excoriation of the upper lip. On examination, a dirty-gray membrane is found within the nostril. Bacteriological examination confirms the diagnosis.

M. Eeman, at the Belgian Society of Otology and Laryngology, 1897, maintained the unity of pseudo-membranous rhinitis. He believed that this affection was always due to the Loeffler bacillus, reporting twelve cases which bacteriologically seemed to support his position.

M. Buys at the same time endorsed M. Eeman's view. In five out of six cases he had found diphtheria bacillus, while he believed the negative result in the sixth case arose from faulty technique.

Osler, in his "Practice of Medicine," 1898, refers to seventy-seven cases of membranous rhinitis, in which thirty-three were found to owe their origin to Klebs-Loeffler bacilli. All ran a benign course. False membrane was limited to the nose in nearly all. Constitutional symptoms were slight, and infection of other children was slight also.

"On the other hand," he says, "nasal diphtheria is apt to be most malignant . . . glandular inflammation being intense. . . . The infection may be primary through the nose."

The quotations from these authors would seem to indicate that they consider all cases of pseudo-membranous rhinitis, whether mild or severe, as really of diphtheritic origin; and that the lighter cases, characterized by absence of systemic symptoms, are in reality the result of an attenuated virus.

Notwithstanding this strong expression of opinion, many cases have been recorded which cannot but impress upon the mind the fact that membranous rhinitis does sometimes occur of a purely non-diphtheritic character. A few of these cases it will be as well briefly to relate.

In 1894 (Journal of Larngology) Brun Murdock reported a case of recurrent membranous rhinitis. The patient was a woman, aged thirty-three, a subject of hay fever. During a period of little over a year she had five different attacks of fibrinous rhinitis without any indications of true diphtheria. A number of microscopical examinations were made, but all failed to show any Klebs-Loeffler bacilli, though there were a number of micrococci of minor moment.

In 1894 Schiffer read, before the Belgian Society of Otology and Laryngology, a paper on "The Pathogenesis of Non-infectious

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Croup of the Nasal Mucous Membrane," with the history of a case. The membrane was confined to the nasal cavities. The general symptoms were slight, save for the nasal membranous obstruction. Microscopical examination proved the absence of the Klebs-Loeffler bacillus. There was no sign of the disease being infectious.

Middlemass Hunt, at the meeting of the British Medical Association, 1898, in a paper on "The Relation of Fibrinous Rhinitis to Diphtheria," reported four cases of fibrinous rhinitis. He said the first case "was in every way a typical one, as the patient remained in good health, had no albumin in the urine, no glandular enlargement, and no subsequent paralysis."

His second case was that of a medical man, in good health, but who sought advice on account of nasal obstruction and profuse watery discharge. He had not been attending any cases of diphtheria, but had assisted in a post-mortem in a case of ulcera tive endocarditis. Both nasal passages were filled with thick white membrane, which left a bleeding surface when torn off with forceps. Considering it to be a case of simple fibrinous rhinitis, no culture was made. Two weeks later the man had severe pharyngeal diphtheria followed by paralysis.

In Middlemass Hunt's third case, the child's nasal passages were lined with membrane, but there was no deposit on the pharynx or tonsils. On removal of the membrane, the surface was raw and bleeding. There was, however, no fever, no albumin in urine, no grandular enlargement; and culture showed no Loeffler bacilli, but the presence of staphylococci and streptococci.

Subsequent inquiry elicited the fact that she, with several other children associated with her, had suffered from tonsillitis a month or two previously, and that her case had been followed by paralysis of the palate.

The fourth case recorded was followed several weeks later by diphtheria in the family.

In summing up the history of these cases, Hunt seems to be of the impression that all but the first were cases of nasal diphtheria; and he doubts the possibility of distinguishing the two diseases clinically, using these words: "I am afraid there are no clinical characters on which we can rely in distinguishing the two diseases, and our one method is to turn for help to the skilled bacteriologist."

In the light of the history he gives, and judging further by his "one method," his third case could scarcely be one of nasal diphtheria, whatever might be said of the second and fourth.

Richard Lake, *Laryngoscope*, September, 1898, gives the

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history of a case of chronic pseudo-membranous rhinitis, on the right side, in a man aged fifty-four. The patient, a hay-fever subject, had unusual pallor, and there was present within the naris, together with the false membrane, a chronic discharge of coagulated secretion. Treatment only had a temporary effect, and on returning for examination ten months later, the disease had increased in severity. The right nasal cavity was filled with a gelatinous mass, resembling the "white" of a plover's egg, and from it was obtained a pure culture of *Staphylococcus pyogenes aureus*, without other septic germs of any kind whatever.

As Lake so pointedly says, "it is only within the last few years that a distinction has been made between diphtheria nasi and membranous rhinitis;" but, in Bosworth's words of years ago, "What the germ is, the pathological laboratory has not yet told us."

Staphylococcus pyogenes aureus is the one usually found in a culture of the simple membranous disease; but neither can it nor the streptococcus claim to be its special progenitors, as the pathological conditions in which these organisms are found are almost infinite. Bacteriologically, however, we can exclude diphtheria; and it is safe to say that any nasal pseudo-membrane which, on careful investigation, fails to exhibit the Klebs-Loeffler bacillus may be set down as non-diphtheritic, particularly when supported by the clinical history of the case.

That primary nasal diphtheria does sometimes occur cannot now be doubted, but, still, it is exceedingly rare. Lennox Browne, in his new work on "Nose and Throat," 1899, says that statistics have proven that it only occurs two times in a thousand cases, while nasal diphtheria by extension from the pharynx occurs in 21·3 per cent. of all cases.

On the western side of the Atlantic I believe it is even still more rare. In a professional experience of thirty years, I have never seen a case of primary nasal diphtheria; and in answer to inquiry among a large number of my professional brethren, with one exception, the same answer has been returned. This exception occurred in the experience of my friend Dr. T. F. McMahon. He has seen two cases. Both occurred in children. In the one, the throat being unaffected, a culture was made from the nasal false membrane, abundant Klebs-Loeffler bacilli being found. In this case the child died. In the other, the Klebs-Loeffler bacilli were obtained from a nasal culture likewise, the throat at the time being unaffected. Subsequently the membrane extended to the pharynx

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and tonsils. This child recovered. In each case diphtheria appeared in other members of the family.

In reference to the results of observations by recent writers upon non-diphtheritic membranous rhinitis, I might quote the following:

McBride says: "The intense local discomfort, together with the absence of all constitutional symptoms, in typical cases, form an easily recognised combination."

Hamilton Potter says: "The membrane is firmly attached to the parts beneath, and is only detached with violence, leaving a bleeding surface."

Walsham says: "The points chiefly to be relied on in distinguishing fibrinous rhinitis from nasal diphtheria are the absence of constitutional symptoms, of glandular enlargement, of albumin in the urine, and of paralytic sequelæ."

Lennox Browne says: "This membrane may be removed without exposing a bleeding surface. Risk of contagion is remote. Cultivation and inoculation experiments give negative results. The neighbouring glands are not involved, and no one has found the Klebs-Loeffler bacillus."

The fact is that in simple membranous rhinitis, except for the nasal obstruction, symptoms are largely absent. The nostril—the disease being frequently unilateral—may be blocked completely by the false membrane, but the discharges are unirritating, and at the same time lack the peculiar odour for which diphtheria is distinguished. The clear whitish colour of the membrane remains unchanged, and in some cases it can be removed without producing hæmorrhage, though the latter is not in accord with my own experience in idiopathic cases.

With reference to the statement that a similar false membrane is always produced by the application of the galvano-cautery to the mucous surface, it must be remembered that this protective covering is only formed upon the spots cauterized, whereas in fibrinous rhinitis the whole mucous lining may be affected.

Sometimes, however, the effect of cauterization is not so limited, and the burning of a single spot within the nasal cavity may induce the formation of false membrane throughout the fossa. Although this fact is well known, the literature upon the subject is so meagre that the report of a case may not be without interest.

In September, 1895, a young lady, aged twenty-five, came to me for treatment for hay fever. On examination, there was nothing unusual in the appearance of the nasal passages, except that the inferior turbinateds were very much enlarged. Otherwise

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they had the ordinary pale purplish hue usually found in such cases. Under cocaine I burned each inferior turbinated body at the one sitting. Twenty-four hours later, on her return for treatment, both nares were stenosed, and the lining of the passages was covered with false membrane. It was of a clear bluish, translucent colour. All that I could do for her relief was to apply a solution of cocaine, followed by vaseline. The membrane gradually became thicker, retaining its colour. In two days it commenced to loosen, and I removed it in large flakes with the forceps. They left a clear surface without hæmorrhage. The subsequent treatment was simply a spray of albolene several times a day to the nose. Recovery was rapid, and the relief to the hay fever complete.

Two years later, in September, 1897, she returned for treatment, again suffering from hay fever. She said she had none the previous year. On examination, the inferior turbinateds were all right, but the middle ones were swollen, and pressing against the septum. I again used the cautery. After applying cocaine on absorbent cotton, I passed the electrode between the septum and middle turbinated on one side, and, pressing outward, seized the surface. A small tampon dipped in albolene was then put in to keep the parts asunder, the operation being repeated on the opposite side.

When she returned for treatment the following morning, the condition formerly produced by cauterization had been repeated, the whole lining membrane of each nasal fossa being seemingly coated with a fibrinous layer. The subsequent treatment was the same as on the former occasion, with a like result.

Although I have used the galvano-cautery for many years very frequently, this is the only case in which I have known it to produce false membrane in the nose, outside of the spot to which it had been applied.

Since treating this case of traumatic membranous rhinitis, I have had under my care two cases of idiopathic membranous rhinitis. They both occurred in the spring of 1898, and the following is a brief history:

Case 1: Miss M. L——, aged seventeen, a clergyman's daughter, had had stenosis of left nostril for two weeks, accompanied by watery discharge and sometimes a little bleeding. Right nostril was quite free. There had been neither fever nor systemic symptoms of any kind. Examination: About 1 centimetre within the alæ, the passage was filled with what appeared to be false membrane of a whitish-yellow colour. Some sero-mucous discharge, but no soreness nor excoriation of lip. No history of diphtheria in family before or after.

After applying cocaine, I removed several pieces of membrane

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that appeared to be loose. They were taken from the septum and inferior turbinated; slight hæmorrhage followed. The surfaces were then brushed with a 5 per cent. solution of nitrate of silver, and sprayed with a quarter per cent. solution of thymol in albolene, the latter to be repeated by the patient several times a day. Internally I gave iron and glycerine.

The patient returned to the office at intervals of two or three days for treatment for several weeks. On each occasion fragments of membrane were removed by forceps, and when bleeding occurred the points were touched with the nitrate of silver solution, the thymo-albolene spray being continued as before. By the end of the second week the membrane ceased to form. Some inferior turbinal enlargement was then touched with the galvano-cautery, and at the expiration of another week the patient was well. There has been no recurrence. Microscopical examination of a culture of the membrane, kindly made by Dr. J. R. Wilson, revealed nothing but *Staphylococcus pyogenes aureus*.

Case 2, External Department, Western Hospital: Girl, aged five years, referred by a member of the staff, as the right nostril had been completely blocked for some time. She was one of a large family. No family history of diphtheria before or after.

On examination the child's throat revealed nothing. There was no fever, no odour, no excoriation. The left nostril was free. The right nostril was filled with what I took for the moment to be a white foreign body of some kind, which I supposed had been inserted. After applying a solution of cocaine, the child submitted to manipulation, and the substance proved to be false membrane, that could be removed in fragments by the forceps. This, like the former case, showed a tendency to slight hæmorrhage on stripping off the membrane. Similar treatment, too, was likewise followed, with the exception that the home application was simply vaseline frequently applied. In three weeks the patient was quite well. Isolation was not enforced. Microscopical examination in this case was not made; there were, however, no developments, either before or after, which would in any way lead to the belief that the case was diphtheritic.

In closing this paper I may perhaps venture to draw the following conclusions:

1. That non-diphtheritic pseudo-membranous rhinitis does sometimes occur, and, though a very rare disease, it is probably as frequent as *primary* nasal diphtheria.

2. That on clinical grounds alone it is possible, in a majority of cases, to distinguish it from genuine diphtheritic disease.

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3. That, owing to a possible mistake in diagnosis, isolation in all cases should be imperative, until a reliable bacteriological examination can be made.

THE CONNECTION OF THE FEMALE GENERATIVE ORGANS AND LARYNGEAL AFFECTIONS.

By Seymour Oppenheimer, M.D., of New York City,

Attending Laryngologist to Bellevue Hospital, O.D.P.; Attending Laryngologist to the University Medical College Dispensary; Senior Assistant to the Chair of Laryngology, University Medical College.

The knowledge that some connection existed between the sexual apparatus and the vocal organs in males was known in remote antiquity among the Orientals, from the change observed in the character of the voice of the then familiar household servant, the eunuch. As the human mind progressed through various ages until the desire for music had become a prominent feature of Eastern life, attention was riveted on the harmonious voice of the young eunuch, and the practice of castration was made the means of livelihood in preparing boys for the church. Even until modern times the Italian castrated boy sopranos were of world-wide fame. F. V. Stein (1) has described a large and prosperous sect in Russia, known as Skopzi, and characterized by requiring castration of all its male members. After this sect had existed for some time as a secret society, attention was called to it by the change in the voice of its members.

In the lower animals the influence exerted by the sexual organs over the laryngeal mechanism is well shown by the stag roaring for its mate during the rutting period, but yet never producing laryngeal sounds at other times; this is also observed in birds making increased vocal efforts during the breeding season, and in the singing birds the rhythm and flow of song is more beautiful during their sexual periods than at any other time.

In a few observed cases of male singers of mature age where castration had been performed, or the generative organs were destroyed by disease, marked changes were noted, not only of the speaking, but especially of the singing voice. At the age of puberty the larynx grows rapidly, and the voice of a boy "breaks" in consequence of the lengthening of the cords, generally falling an entire octave in pitch; a similar change, but much less in amount, occurs at the same period in the female. In many individuals coughing can be excited by stimulation of distant

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