ENDOCRANIAL COMPLICATIONS OF NASAL ORIGIN.*

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On studying the reports formerly published, we find that rhinogenic affections of the brain were considered of very rare occurrence. Even among thousands of autopsies but few such cases were recorded. Nowadays, however, the number of cases recognized increases in the same ratio as our attention is drawn towards them.

The otogenic brain complications are much better known now than they were ten or fifteen years ago, and we are thus enabled not only to recognize them sooner, but to cure many of them. In spite of the fact that our anatomical knowledge has been broadened, we are still at the beginning in regard to rhinogenic brain affections. Though clinical reports of unfavorable cases are so scarce, it is impossible to believe that so few fatalities should occur, when so many extensive and delicate operations are being annually performed all over the world.

Apart from these postoperative cases we shall have to deal here with such as are—we may say—idiopathic, in other words brain affections that primarily owe their origin to purulent diseases of the nose without the patient having been subjected to an operation.

It is the main purpose of this paper to draw attention to such cases just as they occur in the practice of a rhinologist. Consequently we shall have to omit many details, the discussion of which might have proven of great interest.

Let us discuss first the way in which these endocranial complications arise.

These cases which run an extraordinarily rapid course (*ménin-gite foudroyante-Luc*) as well as those progressing slowly, show three different modes of infection, viz., (1) by way of the lymphatics, (2) through the small veins of the mucosa, and (3) through defects of the bone.

In regard to the lymphatics you are aware that while those of the nose have been thoroughly studied, much remains to be learned concerning those of the accessory sinuses. This is especially true of the frontal sinus, while the lymphatic system of the antrum is better known. According to Sieur and Jacob the lymphatic system

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of the sphenoidal sinus is connected with the endocranial lymph vessels. That fact explains the infection of the meninges in those cases of sinusitis sphenoidalis in which the osseous wall of the sinus was intact and no phlebitis of the cavernous sinus was present.

An infection can furthermore be transmitted by way of the veins, mainly the system of the *venae ethmoidales*, which run to the dura and brain, and this explains the rhinogenic infection.

Of the veins of the different accessory sinuses we know that several of them run from the frontal sinus directly into the meningeal veins, while others communicate with the ethmoidal veins. The former penetrate directly the *tabula interna* of the frontal bone, the others anastomose freely with the veins of the dura and of the sinus *longitudinalis superior*. If we take into consideration that, according to MacEwen the venous sinuses of the cranium as well as the intra-cranial veins and those of the *diploe* have no valves, it will be easily understood how an infected thrombus may be carried through the sinus *longitudinalis superior* to the meninges or the frontal lobe, thus producing an encephalic metastasis (quoted after Delsaux).

Similar communications exist with the other accessory sinuses. It may be mentioned here that Sieur and Jacob found the bony wall of the sphenoidal sinus perforated like a sieve, and that there exist communications with the blood vessels of the orbit, which explain how easily an infection is carried to the eye.

Finally an encephalic infection may, according to Delsaux, be carried directly through perforations (Luecken) of the bone. These are either true dehiscences or may result from an osteitis.

From these brief remarks it is evident that encephalic infections ought to be frequent. It is only surprising that the statistics of these accidents are not much larger, and *one* reason for this is that formerly the cause of such an infection was not recognized.

Passing now to the report of cases which have been observed by the writer, and which were of such great interest to him, it is to be regretted that an autopsy could not be obtained in those in which the seat of the affection had not been located with absolute certainty *intra vitam*. In the others, the diagnosis was beyond a doubt.

A differentiation will be made here, too, between post-operative infections and those occurring without an operation or idiopathic. The latter will be narrated here first.

Case 1, published in the *Internat. Jour. of Surgery*, Sept., 1908, and reproduced here in part.

Acute frontal sinusitis, diffuse abscess of the frontal lobe; late operation; death.

Miss Josephine S., aet. twenty-five, a native of Russia, family and personal history negative, came to my clinic May 13, 1908, complaining of headache and purulent discharge from the nose, which had started a week ago.

Diagnosis: Acute empyema of the right frontal sinus. The removal of part of the middle turbinated body was recommended, but she refused any kind of an operation and withdrew from further treatment. About four weeks later she returned with the following account: The purulent discharge had continued up to three days ago, when it suddenly ceased. An intense headache, much worse than before, had set in, especially over the region of the right frontal sinus. The next day edema of the right eye appeared, extending down to the cheek. The following day she vomited once, and had chills and fever; the appetite was poor, the bowels constipated. This time she was more than willing to go to the hospital, and was sent there immediately.

Operation, June 12, 1908. As there was strong evidence of the empyema having extended to the antrum of Highmore, that sinus was opened first through its anterior wall. Some pus and many granulations were found there and removed, and a counter opening into the nasal cavity made through the inferior meatus. Then a radical operation was performed on the frontal sinus. When I made the incision through the eye-brows a mass of pus poured out, especially from the region of the external canthus. Evidently it had spread to the eyeball, too. The anterior wall of the frontal sinus was then excised in the usual manner. After removing all the debris from that cavity, the posterior wall of the sinus was found to be eroded at one place. The dura lay before us bulging outwards. A hypodermic needle inserted at that point revealed the presence of pus. After making an incision into the dura a quantity of pus was liberated under great pressure—I should think there were about two ounces of it. Then an opening into the nose was made quickly and drainage tubes inserted. These were arranged so that the one leading from the brain cavity did not communicate with the nose. Then the wound was packed and the patient put to bed.

On the next day, June 13, 1908, she was in a stuporous condition. The temperature in the morning was 102 degrees F., and at 5 p. m. 106 degrees F. Several attacks of convulsions on the left side were noticed (the abscess was on the right). The patient took

nourishment and retained it. Dressing changed. As the drainage tubes were entirely obstructed, new ones were inserted.

June 14, 1908, condition of patient unaltered. Dressing changed. Again the tube draining the brain abscess was entirely clogged by thick masses (brain tissue?).

June 15, 1908, convulsions occurred more frequently. Temperature 106 degrees F.; pulse now 120 to 130, of low tension and irregular. The patient was almost completely comatose and did not respond to questions; the left eye was closed, the pupil dilated and did not react to light; reflexes absent.

I decided now to make counter-drainage by trephining over the right frontal lobe. When the dura was opened a large amount of pus again escaped under great pressure. A probe inserted into the opening thus made passed into a mass of fluid, and it seemed to me as if more than the frontal lobe was imbedded in pus. The patient died the next morning. No autopsy was permitted.

The question now arises: What can we learn from such a case? Unquestionably the large majority of cases of acute frontal sinusitis do get better without an operation. The writer himself has seen many such instances. But the fact is that in those cases drainage could be established in some way, thus freeing the cavity from retained pus. However, once retention of pus is noticed, any obstruction to its exit should be removed immediately.

Another important question is this: After having opened the dura through the frontal sinus at the first operation, was it sufficient simply to drain the abscess or should counter-drainage have been immediately established by trephining? This is a question which as yet we are unable to answer satisfactorily, and it will require much more experience before a final opinion can be given on that point. At any rate, I felt at the first operation that I could not risk trephining, owing to the exhausted condition of the patient.

Case 2. Sinusitis frontalis of grippal origin; extradural abscess; abscess of the frontal lobe; operation; cure.

L. K., teacher, aet. twenty-five, consulted me on account of severe headache, swelling over the region of the right eye, fever, etc. Two weeks previously he had gone through an attack of influenza, the fever had subsided, but he had constant headaches and some purulent discharge from the nose. Two days ago the fever returned, and, at the same time, the swelling. There was fluctuation of the glabella over the right frontal sinus, pus in the infundibulum, etc. Temperature, 102.5 degrees F.

Operation, June 1. Opening of the frontal sinus after Kuhnt. On incision a foul-smelling pus was evacuated. The bone above and externally to the medium-sized frontal sinus was discolored and covered with bloody patches. Removal of the bone at a distance of 3 cm. upwards and 2 cm. outwards to the frontal sinus revealed an abscess cavity between the dura and the bone. No pus was obtained by going into the brain tissue with a needle. Drainage into the nose.

The next morning the temperature was 102 degrees F., pulse 130; immediate change of dressing. Wound looks good. Severe headache.

June 3. Headache worse; twitching of the extremities; loss of appetite.

June 4. Refuses any kind of nourishment. Semi-stupor.

June 5. *Second operation.* After opening the old wound the dura was seen bulging outward. With the needle at a depth of about 2 cm. thick greenish-looking pus was found. The dura was then incised and a collection of pus (about 100 ccm.) evacuated. The further course of the disease was uneventful so that patient could be discharged *cured* from the hospital six weeks later. According to information received now he is perfectly well and able to follow his profession as a school teacher.

Although, as a rule, I do not care to operate during an attack of influenza, or right afterwards, as according to experience infections elsewhere (pleurisy, empyema, pneumonia) may readily set in, still this case gave us a pleasant surprise, for in a comparatively short time after the operation was done a cure was obtained.

It is to be mentioned that at the first operation there was no indication whatsoever to incise the dura, in spite of the presence deep in the frontal lobe of such an abundant collection of pus. Fortunately the pus found its way to the surface, so that by a simple incision and drainage the patient could be cured.

Case 3. Acute empyema of sphenoidal sinus affecting the other accessory cavities; abscess of temporal lobe (and frontal lobe?).

L. S., college student, aet. nineteen, was admitted to the hospital August 29, 1908.

Present history: Eight days prior to admission, patient was attacked suddenly with headache, a serous nasal discharge, diarrhoea and vomiting. Temperature 104 degrees F.; no chills. Two days after the onset, the nasal discharge ceased. Coincident with this there appeared redness and swelling over the left upper eyelid, with an increasing burning pain. The headache became more

marked and localized to the left side. Patient began to have repeated attacks of chills, which lasted from five to ten minutes; the swelling of the upper eyelid became more marked and more tense—the pain and tenderness excruciating. On the day of admission patient was in a semi-conscious state.

Temperature 105 degrees F.; pulse 124; respiration 24.

No rigidity—no convulsions. No paralysis.

Patient in a semi-stuporous condition; does not respond to questions. Marked edema of left eye and swelling and redness of loose tissue about it. There are also edema, redness and tenderness over this region of the forehead. Pupils are equal and react to light.

Reflexes present; no Babinski.

Patient operated on as soon as admitted by a general surgeon.

An incision was made over the left eye-brow one inch long; free pus escaped apparently under tension. A small portion of the anterior wall of the frontal sinus corresponding to the skin incision was then removed. There was a similar escape of pus under tension from the frontal sinus. The cavity was curetted and packed with gauze. The general condition of the patient was very poor.

August 30: General condition bad; temperature running a septic course, ranging between 100 and 106 degrees. Pulse irregular, at times very rapid, at other times very slow, ranging between 68 and 140. Patient in stupor from which he could be aroused with only slight difficulty. Very pronounced motor aphasia. Delirious and very restless at times. No signs of any motor paralysis. No interference with sensory powers.

August 31: Condition slightly worse; temperature still high; delirious at times; stuporous condition; motor aphasia marked; paralysis of the right upper and lower extremities marked; Babinski present; pupils equal and react to light; patient still responds to sensory impulses.

On the evening of that day I saw the patient for the first time, and it was *with great reluctance* that I decided to attempt another operation at the urgent request of the relatives. A wide opening into the frontal sinus was made, extending far out to the external canthus. The sinus was divided by several septa, and granulations and pus filled these partitions. The posterior wall showed no perforations. Then the ethmoidal cells were opened from without and a considerable quantity of pus evacuated. Finally, in accordance with my usual custom, I tried to probe the sphenoidal sinus, but to my great surprise I got way beyond it (perhaps 2 cm. or even further back), into an apparently purulent mass. The posterior wall

of the sinus could not be felt at all, and it was evident that the sphenoidal sinus and the adjoining brain tissue formed one large abscess cavity. Patient died four hours later.

Although no autopsy was permitted in this case, it seems to me that the temporal lobe was mainly affected and not the frontal lobe. We may draw that conclusion, not only from the direction the probe took, but also from the fact that the entire posterior wall of the frontal sinus was intact, while the corresponding wall of the sphenoidal sinus was entirely gone. Consequently the process in the latter sinus was the older as well as the primary one. Later the ethmoidal labyrinth, the frontal sinus, etc., became involved.

This case shows another feature of importance. Although no one could assert that death would have been prevented by a thorough operation from the start, yet the possibility exists that the wall of the sphenoidal sinus had not been perforated at the beginning. At any rate the case demonstrates again how important it is to probe the sphenoidal cavity. The anatomical researches of Sieur and Jacob in reference to the latter cavity are well known to me, and while I am aware that sieve-like perforations of the posterior wall have been found by them, a total absence of the wall has not been noticed before.

Case 4. Regionary metastasis from the frontal and sphenoidal sinuses.

The patient, a tailor, aet. thirty-eight, fell sick after taking a great deal of bad whiskey, and went from one hospital and from one neurologist to another. Almost everyone had a different opinion of his case. In the course of his wanderings he visited the Roosevelt, Mount Sinai and Long Island City Hospitals. He had been declared to have a tumor of the brain, local irritation, lues, etc. Dr. Spitzka finally referred him to me, and when first seen he was quite rational, though dizzy. He came to the office with his wife, who had to support him. There was no lues; a thorough antiluetic treatment had been without effect. He gave a history of having had a discharge from the nose, which ceased suddenly, and almost immediately a terrific headache set in, from which he still suffered. The pain extended over the region of the right frontal sinus and along the right side of the nose. A great deal of pus was found in the middle meatus. The frontal sinus was syringed and pus obtained. This was sufficient evidence upon which to recommend operative intervention, and this was done the next day. Before the operation the patient's temperature was

101 degrees, pulse 54; he did not know his own name nor his wife's, etc. Only a few drops of chloroform were required for the narcosis; no morphine had been given. On opening the frontal sinus, half of it showed white bone, with no mucous membrane, but granulations and some pus. There was no communication with the other side or with the cerebrum. The ethmoid cells were opened, and some pus found. The patient was bandaged and put to bed, and did very well. The next day he recognized me, recollected his name, his age, etc., which he did not know the day before, and said he had not felt so well for years. This condition continued for the next week, and I then left for my vacation, but was so interested in the case that I requested daily reports, which I received from the house surgeon. These were very good, and the surgeon in charge thought it was time to let the wound close. On the 7th of August I received notice—this was a few days after the wound had closed—that the patient's general condition was good, and that he was feeling well and mentally perfectly clear. The following day, however, I received word that the patient was ill and suffering from considerable headache limited to the right side, which was tender to percussion. His pain before was confined to the right side of the nose, and later it extended to the left side. The report continued that the patient was stupid and dull, at times irrational and incoherent, never violent; had attacks of dizziness, and remained in bed, as he could not walk on account of vertigo. He saw very well, but recognized objects poorly. This condition kept up for some time.

August 12. His condition for the previous two days had greatly improved, but he still complained of severe right frontal headaches. On August 14th I received this note: "The directions forwarded by you will be followed closely. The condition remains unchanged, and while there is nothing unusual, he complains that the pain in his nose and head is more severe than previous to operation. His eyes were examined by Dr. Torok, who says that there is a double neuritis, more advanced on the right side, and subacute in character, and neither suggestive for or against a cerebral involvement."

This condition kept up until my return in September. I examined the patient and again found much pus in the nose, and recommended re-opening the frontal sinus, but the family objected and nothing else could be done excepting syringing the sinus. Afterwards the relatives consented to having another operation performed. That was done on September 30.

The frontal sinus was reopened and thoroughly inspected, after removing the granulations that had formed in the meantime. There was no alteration of the posterior wall of the sinus visible microscopically, so that it was difficult to decide at which part to open the cranial cavity. His pain having been mostly situated near the median line, an opening was made there, following the suggestion made by A. Denker (Frankel's Arch. Bd. 10, p. 412). The entire posterior wall had to be removed, but no pus was visible, nor any discoloration of the dura, which was incised with negative result. Finally a needle was inserted into different parts of the frontal lobe, but again gave no evidence of pus. It was apparent to me that we had to deal here with a deep-seated abscess, which could not be localized. The course of the disease confirmed that opinion.

During September he was under close observation, and it was noted that whenever there was a discharge of pus the patient felt better; the temperature went down, the pulse up. His pulse was as low as 54 on one occasion. When there was no flow of pus, the temperature was higher, and the patient felt dull.

At that time he was demonstrated by me before the Section on Laryngology of the New York Academy of Medicine.

The patient had no convulsions until October 17, when for the first time in the history of the disease he had an attack of muscular twitching of the right arm and leg, lasting for five minutes, accompanied by unconsciousness and stertorous breathing. This attack recurred on October 20th, and after that frequently. General convulsions set in, and in January for the first time choked disc was found. He recognized my voice, but could not see me.

At this stage, it seemed to me, that the sphenoidal sinus was affected and also the adjacent brain tissue.

Further operative intervention was refused by the relatives.

His condition grew worse steadily and on January 28 his status was as follows:

Patient is dull, apathetic. Respiration is deep; sighs frequently. Apparently completely amaurotic. Nystagmus especially marked towards right; no ocular palsies. Pupils—unequal; right is larger. They are regular in outline, but do not react to light. Does not recognize objects when placed in left hand. Patient is unclean, handles and picks at his own feces. Wants to eat all the time. Incontinence of both spincters. When observed patient uses mainly right hand, rarely voluntarily using left upper extremity. Lies in bed with tendency to keep face turned toward left. Marked rigidity of left upper and lower extremities. There is some flexor

contraction of left elbow. All active and passive movements possible on left side, but slowly. No spasms, twitchings, or tremor observed. Reflexes: Jaw jerk—present. Reflexes of upper extremities—active on both sides. Knee jerks—active on both sides. Achilles jerk—normal. No clonus or Babinski.

Superficial reflexes. -1-st. abdominal on right side obtained, left side not obtained. Cremasteries not obtainable. Urine and blood normal.

Feb. 25, 1909. About noon suddenly became unconscious. Face turned towards left, eyeballs deviated toward right, conjugately. No twitching anywhere; pupils unchanged. After two or three minutes patient began to breathe stertorously, and finally regained consciousness.

Feb. 26, 1909. Similar attack.

Feb. 27, 1909. Had two such attacks.

Feb. 28, 1909. Appeared this morning rather stupid, more so than before. After dinner slept a great deal; about 2 p. m. began to breathe stertorously; was unconscious; marked spastic contraction of the left upper and lower extremities. No clonus or Babinski elicited. Respiration frequently sighing. Pupils unchanged.

Exitus in coma.

To the deep regret of the many physicians who had watched the case with me, no autopsy was permitted. But even without the post-mortem findings we are pretty sure in assuming that there was one or more pus cavities within the brain. Not only is the course of the disease in favor of that theory, but also the fact that choked disc appeared at a time when the condition was far advanced. This is in decided contrast with brain tumors, for only these can be considered here. In tumors of the brain choked disc is a very early and important symptom, while in purulent affections it is not. The above case is a new proof for that fact.

In reviewing once more these four cases we must acknowledge that Case I, died because the operation had been performed too late. Surely every recent case ought to be considered very carefully, especially before we open up the cranium. But once convinced that the only salvation lies in broad opening of the skull or the dura, etc., an operation should be done at once, for every hour's delay counts against the patient. The favorable cases of Herzfeld of Berlin, Luc, Denker, etc., may be mentioned here as proof of this, while my case mentioned above, which was operated upon at such a very late stage, is proof for the contrary. *Luc's** patient had very few symptoms, little fever, no meningeal symptoms, but moderate head-

ache, and yet at the operation pus was found in the arachnoidal space. The case of Marc Paunz of Budapest might also be mentioned here.

If one is lucky enough to strike pus, or if after opening of the dura a fistula is spontaneously formed, as in Luc's case, or the pus forces the dura outwards as in my second case, then the patient is saved; otherwise not.

That under exceptionally favorable conditions a cure may result, although everything points towards a retention of pus, is demonstrated by the following case reported by Georges Laurens:

The patient was a boy, aet. six, who developed septicaemia after the sinus lateralis and the bulbus jugularis, which were filled with purulent thrombi, had been opened. Besides, he had intense headaches, photophobia, rigidity of the neck muscles, Cheyne-Stokes' respiration, delirium and high fever. The child did not answer questions nor did he recognize anybody. Everything pointed to an arachnoidal infection. And yet without any intervention whatsoever, without even a lumbar puncture, which was considered useless, all symptoms disappeared within two days. Only the septicaemia lasted for three more weeks, after which the patient got perfectly well.

We shall now proceed to the second part of our theme, the *post-operative infections*. That endocranial infections occur after operations on the accessory sinuses is an established fact. But the question has not been answered satisfactorily, as to how they originate. The possibility that through some fault of the surgeon or his assistants an infection may be produced at once presents itself. Yet one has to acknowledge the fact, or, at least, to reckon with it, that in most hospitals nowadays the asepsis is a thorough one. Therefore the probability exists that the infection is carried through the lymphatics into other regions of the body, and that through the operation the as yet latent and encapsulated infection is diffused and becomes general. Although I can report to-day only one case of endocranial infection which is probably due to an operation, I am well aware that such cases are frequent enough, but not published as a rule! In the interest of our patients and of further progress a change in such tactics would be very desirable.

Case I. L. H., laborer, aet. forty-seven, born in Russia, has been suffering with purulent discharge from the right nostril and severe frontal headaches for the past year.

No constitutional disturbances.

Physical examination negative, except for tenderness over the right frontal sinus. Intranasal examination revealed chronic empyema of frontal sinus.

May 8, 1909, *operation*. Moderately large antral cavity filled with pus and granulations. The other accessory sinuses of that side then were opened and subsequently the wound healed by primary union.

For about a week after the operation, the patient seemed to be in a semi-stuporous condition, gradually developing general spasticity with a tendency to formation of bed sores, and involuntary urination and defecation. The temperature varied from 99 to 101; pulse 80 to 110.

The general condition remained about the same for three weeks, except for slight signs of improvement, viz., the upper extremities gradually became less spastic and some voluntary motion returned to them. The lower extremities, however, remained markedly spastic, and the incontinence of urine and feces continued.

On May 29, 1909, Dr. I. Strauss made the following findings upon examination:

"Patient fairly well nourished; general condition fair. Mental state one of semi-stupor; answers questions rationally, but slowly. No sign of cranial nerve involvement. No paralysis of upper extremities. Lower extremities, markedly contracted. Toes held in position of extension. Can straighten out the legs partially with great difficulty, and contractures can be passively overcome, but only by causing great pain. There is considerable rigidity of the neck. Upper spine is tender upon hard pressure. There is very marked hyperæsthesia over both tibiae anteriorly. The reflexes are all exaggerated, and ankle clonus can be elicited in the left foot, but not in the right, probably due to extreme spasticity.

"Babinski and Oppenheim negative. No sensory disturbances, except along the buttocks and posterior surface of the legs, where there may be some hyperæsthesia, but patient's mental condition is not such as to obtain an accurate statement.

"Pupils equal and react to light and accommodation. Field of vision appears normal."

Lumbar puncture and blood culture were negative. Blood pressure 120.

A few days later, by request of relatives, another neurologist was consulted, who made the positive diagnosis of a localized abscess in the frontal lobe. Consequently, in the presence of several surgeons a *second operation* was made on June 11, 1909.

The portions of the right frontal sinus left from the first operation showed no gaps. The left frontal sinus was now opened, but showed no anomalies. Then the cranial cavity was opened up over an area of a circumference of about 4 cm., the dura incised, and the needle introduced at different points, but no pus obtained.

For the two weeks following the operation, the condition of the patient became progressively worse.

Marked emaciation, increase in general spasticity, increasing stupor, intermittent temperature, 100 to 102½, ante-mortem rise to 104. Pulse rapid and feeble, finally imperceptible for 24 hours.

June 26, 1909: Exitus letalis.

Autopsy: Brain tissue did not contain any pus or other evidence of pathological changes. Internal hydrocephalus, clear fluid with flocculi in the ventricles.

Diagnosis: Chronic *lepto-meningitis*, involving entire pia, especially the basilar portion. No evidence of new growth. Cerebellum not examined.

There is no doubt, that we were justified and even in duty bound to perform the second operation as soon as a competent neurologist had made the diagnosis of a localized brain abscess. It certainly did not lessen the patient's chances of recovery, since he was losing ground constantly. But it would have been more fortunate if the diagnosis of the second neurologist had not disappointed us.

A different question is whether the leptomeningitis was produced by the first operation or not. It seems pretty safe to assume that the infection may have been present before. Not only is that proven by the pathologico-anatomical findings, but also the rapid appearance of certain symptoms, as for example the bed sores a few days after the operation, etc. Of course, in a case like this where there were no meningeal symptoms prior to the surgical intervention, it is to be suspected that the infection was stirred up by the operation. It will take a great deal more study before such cases are cleared up satisfactorily.

Case 2. I may be permitted to mention this case on account of its general interest, though it does not belong to the category of *endocranial* infections.

Mrs. A. I., forty-two years old, called on me at the suggestion of her physician, April 3, 1907. She complained of pain over the right eye which had been present for more than six years. She

*Un cas de meningite suppuree etc. La Presse oto-lar. Belge 1905.

had suffered from frequent colds, and had a purulent discharge from the nose. Anosmia. After removal of masses of polypi and the middle turbinated body, an empyema of all the accessory sinuses of the right side was found. After drainage had been partly established, however, the patient felt better and stayed away more than a year. On the 12th of June, 1908, she returned and then a radical operation had to be done. The operation was uneventful, but unfortunately through some error the maxillary sinus was reinfected and from there all the other sinuses as well. The patient suffered intensely from headaches, which could not be relieved by intranasal manipulations. Finally another operation had to be resorted to on May 27, 1909. Nothing unusual occurred. On the 6th of June it was remarked that she was to be discharged from the hospital in a day or two, when she suddenly commenced to complain of pain over the chest and cough. Then the temperature rose to 102°, assumed an intermittent character, reached 103 and 104° F., and remained at that level for weeks, with intermissions here and there. A great deal of purulent expectoration was discharged in which no tubercle bacilli were found. The diagnosis was *interlobar empyema* on the right side with perforation into the bronchi. It was located between the upper and middle lobe and could be distinctly seen in the Roentgen picture. This diagnosis was confirmed by a prominent medical man.

In a discussion with several colleagues the question was raised whether the empyema was in any way to be connected with the second operation. In spite of some opposition it was my conviction that such was the case. Notwithstanding the fact that there is no more discharge from the nose and no more headache, the external wound being also healed perfectly, we have reason to believe that the infection was carried through the lymphatics to the *lungs of the same side* in a similar way as in the previous case to the meninges. A medical consultant told me that he had seen quite a number of cases like mine in New York City and neighborhood, and that he did not consider such an occurrence as very rare and yet nothing has been published in our literature.

After any operation, radical or not, an infection may occasionally set in, and everyone is naturally on the lookout for such unpleasant occurrences. In the following case the symptoms were so misleading that almost every physician would have diagnosed the case as frontal sinusitis, which, however, it was not. It may be recorded here as rather instructive.

Mrs. S. H., aet. sixty-four, consulted me first on February 20, 1901, on account of a hydrorrhœa nasalis. The discharge, which amounted to four ounces daily, came only from the *left* side. It stopped of itself after about a year, never to show up again. On May 7, 1906, or about five years after her first visit to me, she again consulted me. This time she complained of a great deal of pain over the *right* eye and a profuse discharge from the *right* nostril. On examination a frontal sinusitis was found on the right side. A radical operation was performed, from which she soon recovered. The following winter however, after a very cold spell, I was asked by the family physician to see the patient again. There were present slight temperature, a yellowish discharge from the nose and swelling over the right eye at the place of the operation, all these symptoms naturally pointing to a reinfection of the sinus. The patient, however, declared immediately that she would never submit to another operation. The temperature subsided the next day as well as the swelling over the eye, but the following day another appeared on the cheek. The true nature of this was only recognized after a third similar swelling had appeared on the forehead and cheek of the other side (left). It was nothing but an *angio-neurotic oedema* which was easily explained by the hysterical condition of the patient.

A case like this should teach us to be careful, for even a healthy person may get a cold in the head with muco-purulent discharge without having an empyema of any of the accessory sinuses. I have occasion to see the patient on and off, as she still has manifold hysterical symptoms, but her nose has remained perfectly healthy. This only à propos.

From the large literature on our theme, which is to be found in Gerber's exhaustive work, as far as the frontal sinus is concerned, the following two cases of Muller (Wien, klin. Woch. 12, 1895) will be quoted in conclusion. The one was that of a child with an empyema of the frontal sinus. At the operation there was found an abscess of the frontal lobe. Trepanation and cure.

In the second case, with exactly the same symptoms, an operation was also performed, but the abscess could not be found. It was only discovered at the autopsy at the base of the frontal lobe.

These two cases are very characteristic, for they reveal the one great difficulty which we have to deal with, viz., the finding of the pus after it has once been positively diagnosticated. In one case it is very easy, in the other impossible. What happened to Muller

in his second case has occurred to others as well as to me and is bound to happen in the future.

But of still greater importance will it be in the future to make a correct diagnosis in those cases which present obscure symptoms not pointing to an affection of the nose and which are sent from one neurologist to the other without the true seat of the disease, i. e., the nasal chambers, being recognized. Your attention is called here to Case 4. Although the diagnosis could not be confirmed by postmortem findings, after long observation we came to the conclusion that the infection originated in the nose. Of such instances there are many. Only after some of these "obscure" cases have been operated upon successfully will we be permitted to examine them as a matter of routine—not before.

Though in my first series of four cases only one has been saved, the result ought to be considered as rather encouraging. First, because we have a right to be satisfied even if we save only a single one of these cases that formerly were all lost; secondly, because two of the remaining three cases were operated on at a period so late (one was almost in extremis) that very little could be expected. Surely our larger experience will, it is to be hoped, give us better results in the not too distant future.

In conclusion I cannot help repeating the encouraging words used by our Colleague Lermoyez of Paris, who said:

"Nous croyons qu'hesitation d'hier, conquête d'aujourd'hui, pratique de demain, tel sera bientôt le traitement rationnel des complications endocraniennes des sinusites de la face, nouveau fleuron à ajouter à la couronne de la rhino-chirurgie."

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Osteo-Fibroma of the Superior Maxillary or Diffused Fibroma of the Maxillary Spaces of the Superior Maxilla Invading and Filling the Antrum of Highmore. DR. CAUZARD. *Bull. de Laryngol.*, Oct. 1, 1908.

The case is interesting, as it is only the twelfth of such cases published in France. The whole of the sinus was filled with spongy bony tissue, so soft that it could easily be curetted, this being followed with only an appreciable amount of blood. The result was excellent. The histologic examination showed osseous trabeculae of normal structure, separated by fibrous tissue of elongated cells, characteristic of fibroma.

W. SCHEPPEGRELL.