

A word as to feeding may be necessary. For the first few days after intubation liquids only are permissible and they should be taken in the Casselberry position with the mouth lower than the pharynx and it lower than the oesophagus. But it is surprising how quickly these patients learn to swallow a varied diet naturally and how few abnormalities they display. Even if an intubation tube should have to be worn permanently this is far preferable to the alternative of a tracheal cannula.

### EMPYEMA OF THE FRONTAL SINUS.<sup>1</sup>

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THE case I report illustrates so well the so-called closed empyema of the frontal sinus and certain peculiar phases of the disease that I have thought it might prove of interest. By closed empyema I mean that at no time could a discharge of pus into the nose through the frontonasal canal be detected. Though several careful examinations were made from time to time, this most important symptom of disease of the accessory cavities of the nose did not appear. The history of the case is as follows: The patient is now thirty years of age. He had most of the diseases incident to childhood, and since then has been healthy until the beginning of his present illness. His parents are living at advanced ages, and are healthy. In January, 1904, he had what he considered a mild case of "grip." He felt weak and languid and was forced to lounge about his room for two or three days. After this indisposition he convalesced rapidly, and was soon able to resume business. About two weeks later he was taken with a severe pain over the left eye. The pain recurred regularly every other day, and was peculiar in that it would begin at twelve o'clock noon, or between the hours of 12 and 4 P.M. If it did not appear before five o'clock in the afternoon the patient had nothing to fear until the next day. Occasionally the pain would miss the alternate day, but was sure to come the third day. On Sunday, if the patient remained perfectly quiet, the attack would be postponed until Monday, but if he took a walk or exercised in any way he was sure to suffer. The duration of the pain was always five or six hours. In the beginning of the trouble he suffered at times—usually in the morning—from dizziness or, to use his own words, he felt as if he were under the influence of liquor. The attacks always began in the left temporal region, with a feeling of numbness, and gradually extended toward the middle

<sup>1</sup> Read before the Medical and Chirurgical Faculty of Maryland, April 26, 1905.

line of the head with the point of worst suffering in the region of the supraorbital notch. The pain, at first slight, would grow more and more intense until, at the height of the paroxysm, the patient would walk the floor in agony. From this period of culmination, there would be a subsidence of the trouble, until it would disappear entirely. The patient consulted his family physician, who gave him anodynes, with no benefit. He then fell into the hands of two homoeopathic physicians, neither of whom gave him any relief or an explanation of his pain. He then drifted around from one physician to another, and was in turn treated for stomach trouble, liver trouble, and nerve exhaustion. Thinking there might be some connection between the pain and his eyes, he saw an oculist, who told him that his glasses were correct. Two rhinologists were seen. One of them assured him that the pain had no connection with his nose and gave him such anodynes as he had not already taken. Finally, after several weeks of treatment, he suggested that the supraorbital nerve be cut. Just before consulting me the patient saw a prominent physician, who advised the injection of osmic acid into the nerve and the application of electricity over the affected area before having the nerve cut. He consulted me November 29, 1904. After hearing his history I felt that where so many had been unsuccessful I was doomed to failure also. From the history of the pain having followed "grip," from the periodicity, and from the fact that it was always localized over the left eye, I immediately thought of probable frontal sinus disease. I questioned him carefully as to a discharge into the nose or into the nasopharynx with a negative result. He denied having had any such symptom. Inquiries as to the condition of his stomach, liver, intestines, etc., revealed nothing worthy of note. His general health was good. He was wearing compound, hyperopic lenses, given him two years before by a very competent oculist, which corrected his astigmatism entirely. The edges of the lids showed a slight blepharitis. Inspection of the face gave no evidence of swelling in the affected area. Examination of the nasal fossæ showed on the right side a septal spur which did not interfere with respiration. In the left side, with the exception of an abnormal dryness of the mucous membrane, which I have several times noted in disease of the accessory cavities, there was nothing to throw any light on the mystery. After cocaineizing, the most careful inspection failed to show pus anywhere in the nasal fossa. On being asked to localize the area of pain, the patient would place his finger in the middle line of the head just above the root of the nose and describe a semicircle outward almost to the external angle of the orbit. The pain never exceeded this area. Baffled by my examination of the nostrils, with the exception of the dry mucous membrane which added one link in the chain of evidence, I turned my attention to the supraorbital region. Transillumination of the two sinuses gave no information, one side being

as dark as the other, which was due, as I afterward discovered, to the thickness of the anterior wall of the cavities. Palpation and percussion over the left eye caused decided tenderness as contrasted with the opposite side. I then made a diagnosis of frontal sinus disease from the following points: 1. The pain followed what was undoubtedly an infectious disease. 2. The periodicity of the attacks quite common in frontal sinus disease. 3. The dryness of the nasal mucous membrane. 4. The extreme tenderness of the affected as contrasted with the sound side. The most valuable symptom was tenderness on percussion, which is almost pathognomonic of frontal sinus disease, while the group of symptoms seemed to point unerringly to the cavity as the cause of the headaches. Since he had had the pain for nearly a year, I advised an external or radical operation. The possibility of frontal sinus disease had not been suggested to the patient, and, not wishing to run the risk of possible deformity from an operation, unless it should be absolutely necessary, he decided to try the osmic acid treatment. The injections into the nerve were made, but did no permanent good. January 2, 1905, the patient came to my office in great pain and begged me to give him something to relieve him. He told me that he could see no relief in sight, and that he was fast becoming desperate. I prescribed for him, and again advised opening the sinus. He had suffered so long he was now ready to submit to any treatment that offered even a possibility of relief. On the afternoon of January 4th I operated at the Presbyterian Hospital, with the assistance of Drs. Carroll and Bray. Under ether anaesthesia an incision was made through the skin along the orbital margin, and the anterior bony wall chiselled through. This was perhaps three-quarters of an inch thick. On opening into the sinus there was a gush of pus. The mucous membrane was degenerated and covered with granulations. This was carefully removed with the curette, and the bone examined for a possible necrosis. The sinus was large, extending outward almost to the angle of the orbit and upward for at least an inch. After satisfying myself that no necrosis had occurred, I swabbed the cavity with chloride of zinc solution (20 per cent.), followed by alcohol and packed with iodoform gauze. The headaches have disappeared, and have not returned. The cavity is gradually filling up, which is the ideal result of the operation. Pus from the cavity showed staphylococcus pyogenes aureus in pure culture. The chief danger in these cases is the liability of necrosis, with consequent discharge of pus into the orbit and injury to the eyeball, or into the meninges, with the lighting up of a fatal meningitis. Logan Turner has called attention to the possibility of infection of the meninges through minute bloodvessels in the bone without any apparent necrosis.

The cardinal symptom of accessory cavity disease is the presence of pus in the nose. Its absence renders the diagnosis much

more difficult. M. Hajek, of Vienna, perhaps the greatest living authority on these diseases, says in his book (*Die Nebenhöhlen der Nase*, 1899) that in most cases of inflammatory frontal sinus disease pus is present in the nose. Exceptions to this rule are those rare cases in which the opening of the frontonasal canal into the sinus has a valve of mucous membrane, or there exists in the course of the canal an impermeable stricture. Such cases are doubtless exceedingly rare, and since there is a damming back of the secretion in the sinus, with eventual breaking through into the orbit and displacement of the eyeball, they do not fall into the hands of the rhinologist. The occurrence of such cases has been denied by Grünwald and Lichtwitz. Hajek himself has never seen such a case. And again he says that often the attention of the physician is attracted to the possibility of a frontal sinus disease on account of the intermittent, neuralgic character of a frontal sinus pain. He has often heard that a headache which comes on in attacks at the same time of the day is a typical neuralgia of the supraorbital nerve. Behind this typical, intermittent neuralgia how often has he found empyema of the frontal sinus. Particularly do the so-called influenza neuralgias of the trigeminus reveal themselves regularly as typical empyemata of the accessory cavities, especially of the frontal sinus. How easy it would be to heal many of these empyemata if the physician would only think of the possibility of frontal sinus disease and refer the patient to the rhinologist for immediate treatment, instead of after months of delay. Such words from Hajek must make an impression upon all of us.

It may be interesting to refer briefly to the pain of frontal sinus disease. It will be found in some cases that the patient will complain of pain only on alternate days. Such cases will simulate malaria, but treatment with quinine does no good. The pain usually comes on in the morning before eleven o'clock. The explanation is that during sleep there is no drainage through the frontonasal canal, and the sinus fills with pus. On arising in the morning there is a great pressure brought to bear on the opening of the canal, and this pressure produces pain until free drainage is established. I have never before seen a case where the pain came on in the middle of the day or in the afternoon. Such cases are certainly very unusual. In my case it is a question as to what became of the pus that was constantly being formed in the sinus. From the history of frontal sinus disease there should have been a profuse discharge of pus into the nose every other day. But repeated examinations, and the positive statements of the patient to the contrary, are certainly puzzling as to the escape of the pus. It does not seem possible that all, or even a large part of the pus, could have been absorbed into the system without causing decided symptoms, which the patient at no time had. I have not found an explanation of the afternoon attacks in frontal sinus disease.

I believe that many obscure headaches have their origin in some one or more of the accessory cavities of the nose, and that relief can only be obtained by intelligent examination and treatment of the same. The above case is presented as an illustration of a headache which could not possibly have been cured without an operation.

### PERSONAL EXPERIENCES WITH EMPYEMATA OF THE FRONTAL SINUS.<sup>1</sup>

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At the present moment the therapy of frontal sinus affections is one of the much discussed and still unsettled problems in rhinology. During the last ten years various methods have been proposed, enthusiastically commended, and then allowed to drop more or less into disuse. These have varied from the simplest to the extremest methods of operation within the nasal canal, and from simple opening and prompt closure externally to the present much-advocated, very radical procedure of Professor Killian. As a contribution to the general subject the writer begs leave to offer for the consideration of this Association his own personal experiences in empyemata of the frontal sinus, together with some deductions from these experiences, and some observations as to what he regards as the probable future trend of operative procedure in this locality.

While the number of cases presented is not large, and while it is unsafe to reason too much from too limited experience, it is hoped that the deductions may have some value. The cases are reported somewhat in detail, the exact operative procedure being described rather than named after anybody in particular.

In his address at Atlantic City before the American Medical Association, 1904, Professor Logan Turner stated that what was really needed at the present time was an accurate report of the chronicity of the cases, the number of cases affected, the surgical method employed in operating, the treatment of the wound, and the results obtained as regards cure, relapse, the amount of disfigurement produced, and the fatal issue. As a contribution to such a qualified investigation I offer the present cases.

At the outset a certain amount of differentiation of cases must be made. I discard entirely that large group of acute inflammations of the frontal sinus which occur perhaps more and more often as accompaniments or sequelæ of grip, which may or may not be

<sup>1</sup> Presented as candidate's thesis, American Laryngological Association, Atlantic City meeting, 1905.