Royal Society of Medicine

ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY

March 3rd, 1933

President—MUSGRAVE WOODMAN, M.S.

Discussion on Acute and Chronic Inflammatory Disorders of the Ethmoidal and Sphenoidal Sinuses

The opening paper read by MM. FERNAND LEMAITRE and ANDRÉ AUBIN is published in this issue of the *Journal of Laryngology and Otology*, Vol. XLVIII, No. 9, pp. 585-94.

DISCUSSION.

A. LOWNDES YATES : The sinuses with which I propose to deal are the posterior ethmoidal and sphenoidal sinuses. There is considerable difference of opinion as to the pathological features of the discharge which justify the use of the term sinusitis. Some rhinologists include under this heading cases in which there is frank pus, others include those cases in which the sinus is filled with sterile mucus, and others, those cases in which there is no increase of secretion, but in which micro-organisms can be cultured from the scanty contents of the sinus. Rhinologists are tending to take a wider view of inflammatory conditions in the nasal sinuses.

In anterior sinusitis we can gain information from the condition of the mucous membrane in the region of the ostium of the sinus, and we have the aid of transillumination. In addition, radiography gives results which are more certain in anterior than in posterior sinusitis. The type of inflammation met with in the posterior sinuses differs little from that which affects the sinuses of the anterior group, but the diagnosis of the states of inflammation of these sinuses is more difficult because the mucous membrane on to which their contents are discharged is hidden from view and we rely on symptoms and on posterior rhinoscopy for diagnosis.

In any state of inflammation of a sinus, whether of the anterior or the posterior group, the final diagnosis must be made by the removal and examination of the contents of the sinus. In the posterior group of sinuses the results of inflammation may be far more serious than in the anterior group, for the following reasons :—

(1) The anatomical relations of the sinuses ; the carotid artery, the optic nerve and the Gasserian ganglion may come into close relationship with the outer wall of one of the posterior sinuses.

(2) Chronicity of the inflammation is liable to be established by reason of the lack of symptoms in cases of open sinusitis, and because the ostia of the sinuses discharge their contents on to an area of the mucous membrane which is neither in the inspiratory nor expiratory airway, and hence the sinus is not cleansed by sneezing.

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(3) The peculiarities of the lymphatic drainage of the mucous membrane on to which the sinuses discharge their contents are of importance. They drain by two routes, one of which follows the ordinary path pursued by the lymphatics from the remainder of the nose to the cervical glands; the other being more important, in that the lymphatic drainage is, in part, accomplished along the lymphatic sheaths of the olfactory nerves by which infected products may pass to the meninges.

The complications met with as a result of the inflammation of these sinuses are due to the spread of inflammation (*a*) to the optic nerve, producing optic neuritis, (*b*) by the internal carotid artery—spread by this route is stated to be associated with insanity (Pickworth),—and (*c*) by the fifth nerve, which Barnes suggests as a possible route in encephalitis lethargica.

As in inflammatory states which affect the other sinuses, there is, in some uncommon but important cases, a liability to spread of inflammation with complications as a result of treatment. This spread of inflammation seems to be found in those conditions in which the inflammation is maintained by the characteristics of micro-organisms rather than by the obstruction of the ostium of the sinus.

It is well recognised that there are many forms of inflammation of these sinuses in which treatment on accepted lines gives good results. There are a few forms of inflammation in which the accepted lines of treatment fail. The discovery of lysozyme by Fleming opened new avenues of investigation of this matter, and I have examined the discharge from a number of cases of sinusitis by the following simple technique :—

I place a drop of the discharge beneath a cover slip upon the warm stage of a microscope. Lymphocytes are generally seen and often some bacteria. After a certain lapse of time in one variety of discharge, the lymphocytes break down, the micro-organisms disappear, and a transparent fluid devoid of microscopical characteristics remains. In other cases polymorphonuclear cells are present and the solution of the micro-organisms is effected with increased rapidity.

In another type of discharge the lymphocytes break down, but the micro-organisms remain and in certain cases, if inspected the following day, the mucus is seen to contain a greater number of micro-organisms than when first examined. It is clear that the mucus is acting as a culture medium for the micro-organisms which are multiplying in it. Cases which show the first type of discharge, the type which has a high lysozymic factor by which the micro-organisms are destroyed, prove to be cases in which the inflammation is maintained by the obstruction in the ostium of the sinus. Cases in which the lysozymic factor is low and in which the micro-organisms

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are either not dissolved or multiply within the mucus prove to be cases of open sinusitis in which the inflammation is maintained by the character of the micro-organisms.

The micro-organisms may be staphylococci, streptococci, Pfeiffer's bacilli or pneumococci, but the type of micro-organism is not of primary importance. The determining factor in the maintenance of inflammation is that the micro-organism has acquired the power of multiplying in the mucus.

The rough measurement of the lysozymic factor therefore gives us a method which may assist materially in determining which form of treatment will suit the case and in which cases operation is likely to be followed by complications. I found that if the lysozymic factor was high, simple methods of drainage gave the best results. Drainage alone is necessary to effect a cure, and drainage is best accomplished in acute cases either by nature or by shrinkage of the mucous membrane with cocaine. Watery douches diminish the lysozymic power of the mucus and in the laboratory it can be demonstrated that dilution of a bactericidal mucus converts it into an efficient culture medium. For this reason watery solutions must not be used for douching or for intra-sinus lavage in acute rhinitis. Operation also lowers the lysozymic power and it is probably for this reason that the results of operation in acute states of inflammation are extremely bad.

When the lysozymic factor is low and micro-organisms multiply in the mucus, watery douches can be used, for there is no efficient lysozyme that will suffer from dilution. I can refer only briefly to the good results which follow diminution of the surface tension with sodium oleate or bile salts, especially when the douching fluid is caused to enter the sinuses by a modification of the displacement method of Proetz.

The treatment of closed sinusitis is to effect drainage either by causing opening of the ostium by palliative measures or by surgical drainage of a sinus. The treatment of open sinusitis is by palliative measures only, for drainage is already present and the inflammation is maintained by the ability of the micro-organisms to live in the mucus. It is therefore necessary that we should have more knowledge of the inflammatory state which we propose to relieve by treatment and it is probable that pathological investigations of the lysozyme can give us help in settling the form of treatment which will suit the case.

The estimation of the lysozyme seems to be of particular value in cases of posterior sinusitis, for in posterior sinusitis we cannot see the mucous membrane round the ostium and diagnosis is difficult.

HERBERT TILLEY: I will confine my remarks to chronic inflammation of the sphenoidal sinus. I am in entire agreement with Professor Lemaitre that chronic inflammation of this air-cell and

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of the posterior cells of the ethmoidal capsule is much more common than was formerly believed.

In so far as the sphenoidal sinus is concerned, there are at least three reasons why such a condition is frequently overlooked: (1) The relative inaccessibility of this air-cell when compared with that of the more anteriorly situated sinuses. Difficulties will be increased by high septal deviations. (2) The frequent co-existence of some pathological condition of the ethmoid capsule which alone might suffice to account for the symptoms. (3) Perhaps more important than either of these is the fact that in the frequent mild cases of chronic sphenoidal sinus inflammation, the subjective symptoms and objective manifestations are often far removed from the lesion which is causing them.

Anterior rhinoscopy may reveal no obvious nasal lesion, but frequently the lateral wall of the pharynx will be seen to be covered by a peculiarly adhesive, greyish-brown and dry secretion of mucus. Beneath this the lateral pharyngeal band is often swollen and hyperæmic.

Not seldom the laryngoscope will reveal that similar conditions are present in the larynx, and particularly in the inter-arytenoid region, which may be swollen and covered with sticky mucus.

In such cases the nasal endoscope enables the surgeon to obtain a clear view of the posterior choanae, and to detect the situation of pathological secretions, particularly those which appear to issue from the superior and middle meatus. If a purulent discharge be seen in those regions, it may be possible, with a long-bladed speculum, to press the middle turbinal outwards and see a pulsating drop of pus in the ostium of the sphenoidal sinus, and then to pass through it a suction cannula for the removal of pathological secretions from the air-cell.

One of the most characteristic signs of chronic suppurative inflammation of the posterior nasal sinuses is a purulent discharge with œdema of the mucous membrane of the olfactory sulcus.

If anterior and posterior rhinoscopy or nasal endoscopy fail to establish the diagnosis of chronic sphenoidal sinus inflammation, radiography, or the displacement method of Proetz may provide valuable information.

In obstructive conditions, more typical symptoms will be present, such as occipital, vertical or supra-orbital headache, and sometimes a distressing pain referred to the mastoid region.

The underlying principle of treatment is to provide for free, spontaneous and permanent drainage of the sinus, and this can be secured only by removal of its entire anterior wall.

From the operative point of view it may be well to add two warnings: (1) Never curette away the granulations within the sinus: if they are very prominent it is better to wipe them out

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with dry gauze pellets; the smaller ones will disappear if free drainage has been provided. It will be safer to leave the outer wall entirely alone. (2) If too radical a removal of the lower part of the anterior wall be made, the spheno-palatine artery may be wounded.

For a few days after removal of the anterior wall of the sinus, the opening appears to be blocked by an œdematous swelling resembling a polypus. This should not be interfered with because it invariably subsides.

P. WATSON-WILLIAMS: *Retrobulbar neuritis.*—This affection intimately concerns general medicine as well as our own domain, and interests me especially since it was the diagnostic problem which retrobulbar neuritis so often presents that originally suggested the method I have termed " suction-exploration " of the sinuses.

Retrobulbar neuritis occurs in affections in which rhinology plays no part, and when other differentiating signs are absent the diagnosis is obscured. Disseminated sclerosis is an outstanding example in point, for in this disease quite frequently one of the earliest, or indeed the only, symptom present is acute bulbar neuritis, indistinguishable from that due to sinusitis. However, the acute optic neuritis of disseminated sclerosis usually clears up in a few weeks, the disease itself is very slowly progressive and, so far, treatment is of no avail.

Retrobulbar neuritis is, however, quite another matter when it is due to infective sphenoidal sinusitis, not only as a menace to sight but also on account of grave risks from widespread blood-borne infection. In these circumstances it is wrong to watch and wait, for the importance of early diagnosis of sphenoidal sinus infection is enforced by the good results from its disinfection and drainage.

Towards the close of the last century frequent cures of canalicular optic neuritis following operation on the sphenoid and ethmoid cells were being reported, some of them cases in which no nasal discharge could be found. How to avoid needless operations when such cases were referred by ophthalmic and other colleagues—and, be it noted, without any such assistance as may nowadays be obtained from radiology—was really a problem. In my difficulty I bethought myself of the bacteriological examination of specimens aspirated from the sphenoidal sinuses so as to identify the pathogenic organisms, if present, and furthermore obtain irrefutable proofs of inflammatory reaction in the presence of polymorphonuclears and phagocytosis of the organisms and, thus having excluded possible error from accidental contamination, to differentiate the really infected sinus cases from the non-infective cases appertaining to neurology.

Since that time observations, conspicuously the researches of E. D. D. Davis, have proved the sinuses to be sterile in disseminated sclerosis, but on the other hand others, including myself, have

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recorded plentiful examples of retrobulbar neuritis due to sphenoidal sinusitis, which rapidly yielded to disinfection and drainage, the results being demonstrated and measured by the ophthalmic surgeon.

With the recent improvements in radiological technique and the help afforded by endo-rhinoscopy as well as by suction-exploration, there is little excuse for allowing cases of retrobulbar neuritis to drift with no effort to reach a correct differential diagnosis of its cause, and so distinguish those patients for whom the rhinologist can do so much good from those for whom the physician can do so little.

T. H. WHITTINGTON: One of the charms of ophthalmology is that it frequently leads to interesting " team work ", and this is so in the study of retrobulbar neuritis. Foster Moore, in the second edition of his *Medical Ophthalmology*, states that he has not seen a case in which he was fully satisfied that the condition was due to para-nasal sinusitis. Adie would have us believe that the great majority of cases seen by ophthalmologists are due to disseminated sclerosis. You, as rhinologists, have operated on cases in which you feel that sight was restored by your skilful treatment. Personally I have no doubt you are right. On the other hand, I do not remember a case of retrobulbar neuritis being referred by the rhinologist, but I not infrequently refer them to you.

The optic nerve is not homologous with the other cranial nerves. The first two neurones in the course of the visual impulse are situated in the retina, which is itself an outgrowth of the brain, and the fibres of the optic nerve are therefore an association tract, and may be considered an outlying part of the brain. These fibres, like those of the central nervous system, have no sheath of Schwann, are supported by neuroglia, closely surrounded by the pia arachnoid, and bathed in cerebro-spinal fluid, and the whole is surrounded by a tough dural sheath, from which, as in the spinal cord, connections cross the subdural space. As regards the sinuses, it is not in the cases with obvious purulent infection that the optic nerve is affected. It is in the chronic cases in which the infection passes through the bone, often of paper-like thinness. Plastic inflammation occurs between the dura and the pia arachnoid, as it may occur in disease of the spine, and by the combined effect of local pressure and local toxins, function is diminished. It is when the highly susceptible papillo-macular bundle (here in the centre of the nerve) is affected that the rapid loss of vision is noted by the patient.

What are the signs that would lead me, as an ophthalmologist, to suspect some such process, and therefore urge my rhinologist colleague to operate when he perhaps reports a " normal nose ". An analysis of the visual fields is the important thing. In the usual case of retrobulbar neuritis characterised by sudden unilateral loss

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of vision, with absence of—or scarcely any—signs at the optic disc, central scotoma, marked paracentral colour scotoma, and the peripheral field not affected—nine times out of ten we should be right in supposing it would recover spontaneously. But if there is a marked contraction of the peripheral field, signs of peripheral nerve bundle defects, and especially if these connect up with the central scotoma, then I visualise how these are being caused by a process outside the nerve and ask the rhinologist to go ahead. It is taken for granted that the fields of both eyes are examined and all other general examinations made.

T. C. GRAVES : Nasal sinus disease, and particularly sphenoidal disease, may cause, in addition to irritation of the peripheral sensory nerves and end-organs, cerebral and endocrine dysfunction, and thus produce varying degrees of disturbance of the intellectual life, the basal feeling tone and the primitive instinctive mechanisms—especially that of self-preservation—causing the subject to descend to lower levels of mental as well as physical efficiency.

These conclusions have followed an investigation into sinusitis in cases of mental disorder in the Birmingham Mental Hospitals during the last seven years, an investigation inspired by the counsel and carried out with the assistance of Mr. Musgrave Woodman and his colleagues.

The observations thus made were published in the *Journal of Mental Science*, 1932, lxxviii., 459.

The sequence of symptom-groups involving the nervous system, as an untreated sinusitis progresses, may be, if the patient survives, sensory, motor, metabolic, instinctive, feeling-tone, conative and intellectual disturbances, the last including disorders of attention, memory, judgment, perception and cognition. In the more advanced acute stages of the illness associated sensory disturbances caused by sinus disease, are perceived as hallucinations ; thus tinnitus aurium becomes imaginary " voices " whilst the delusions expressed in the acute and chronic stages are determined by the endogenous disturbances of feeling-tone and instinct.

A total of 1,225 cases, 601 male and 624 female have now been investigated by the Watson-Williams technique of suction exploration. Generally more than one sinus is involved in these psychotic cases. Out of a total of 1,001 cases in which positive clinical evidence was present the number of sinuses involved in individual cases was :—

One sinus in 277 cases, i.e. 28 per cent ; two sinuses in 288 ; three in 151 ; four in 148 ; five in 64 ; six in 73.

The incidence of involvement of the sphenoidal sinus is about half that of the antra. Antra alone or with others in 785 cases—397 males and 388 females. Ethmoids alone or with others in

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493 cases—247 males and 246 females. Sphenoids alone or with others in 352 cases—178 males and 174 females.

Whilst mental symptoms are not pathognomonic of disease of any one sinus, they seem to be much more pronounced in cases of disease of the sphenoidal sinus.

In some cases treatment of the disease may be followed by rapid diminution—having regard to the duration of the disease—and permanent disappearance of mental as well as allied symptoms; in other cases relapses are liable to occur. These relapses of psychotic symptoms are, however, the result of reactivation of the disease process of its extension to another sinus such as the sphenoid, and compare with the recurrence of headache in cases without psychotic symptoms.

In a case, notes of which are given below, the final inclusion of the sphenoidal sinus in the sinusitis seems to have been responsible for the appearance of a particularly severe psychosis. This case also illustrates the appearance and amelioration of psychotic symptoms in relation to the colder and warmer months of the year respectively, and their disappearance following drainage of the diseased sinuses.

A chocolate grinder, aged 46, of good stock, was admitted to the mental hospital, *January 24th*, 1929 (first certification). Severe influenza early in 1927 had been followed by an extremely depressed state, from which he had recovered by the following August. Early in 1928 a cold had been followed by another period of depression, and even by the next August he had not recovered as substantially as in the preceding year. With the return of the cooler months he again became depressed and, in spite of rest, and of hospital and convalescent home treatment, psychotic symptoms of depression, fear, and confusion continued with increasing severity until, and after, his admission to the mental hospital. His weight, which had fallen from an average of 13 st. to 8 st. 10 lb., fell further to 8 st. 5 lb.

On *February 25th*, 1929, suction-exploration of the sinuses revealed bilateral antral and right sphenoidal disease. The three sinuses were drained intranasally and the diseased tonsils were removed. Gradually, during the ensuing warmer months—especially after a course of non-specific protein therapy—the patient improved physically and mentally and was discharged on *October 10th*, 1929, from the mental hospital. He returned to work with the same firm, with whom he is still working. He has now passed through four winters without relapse and has regained his normal weight.

F. A. PICKWORTH (Birmingham) said that several years ago, as assistant to the late Sir Frederick Mott, he had begun the study of the pituitary gland in cases of mental disorder. Almost by accident it was noted that the adjacent sphenoidal sinus often contained pus. Since then as Director of the Joint Board of Research for Mental

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Disease, and with the encouragement and assistance of Dr. Graves, he had made the study of the sphenoidal sinus one of the chief lines of research of the Joint Board.

He showed a coloured sketch of a chronic infection of the sphenoidal sinus which contained yellow pus. Near by were to be seen the pituitary, the carotid arteries, and a portion of the Gasserian ganglion. It illustrated the anatomical possibility of chronic extension of the sepsis into (1) the most important endocrine gland of the whole body; (2) the blood supply of the brain; (3) the intracranial nerve structures.

Sluder (1910) had shown that cocaine, applied to the wall of the sphenoidal sinus, anæsthetised the central root of the fifth nerve, and it was therefore reasonable to infer that soluble bacterial products contained in the septic sinus shown would diffuse into the same structures in a manner similar to cocaine. Such absorption would account for the finding in mental hospital patients of (1) endocrine disturbances, by the action of toxins upon the pituitary gland; (2) nerve pareses and reflex phenomena, by the action of toxins on the nerve trunks; (3) histologically demonstrable vascular changes in small vessels of the brain, by the action of the toxin on the adjacent carotid arteries.

Not only toxins, but organisms themselves occasionally reached intracranial tissues from an infected sinus. Acute extensions often being fatal, such invasion by organisms was self-evident, but he thought that less severe, recoverable extensions were by no means uncommon. He had many times found organisms in the pituitary capsule, and in one case these were definitely associated with large masses of colloid, in which were embedded myriads of diplococci within the gland. A picture showed a large mass of colloid which separated the anterior and posterior lobes of the pituitary. This anatomical division of the gland constituents was found in several instances, but its significance was as yet doubtful; however, a correlation might be made with the clinical condition of Simmond's disease, in which severe wasting occurred.

Another specimen showed, in serial sections, the extension of diplococci into the sheath of the optic nerve.

Extensions of sepsis into the cancellous portions of the sphenoid were quite common; they were very tardy of resolution; the sinus membrane might be the first to resolve, so that streptococci were demonstrable in the bone when the sinus membrane seemed normal. As with other bone affections, these might remain latent for long periods, and were rarely associated with pus; tissue reaction seemed to be of the nature of a degenerative atrophy of the surrounding vessels, etc.

A specimen illustrated hyperplastic sphenoiditis associated with a perivasculitis of the carotid arteries of both sides. As all the

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toxic material which was absorbed into the artery was passed to brain tissue, where it was fixed by the lipoids, the correlation of the pathology with the clinical condition of violent homicidal mania associated with Huntington's chorea presented no difficulty.

A specimen was shown of a sphenoidal sinus containing pus. The carotid arteries were actually visible through the posterior wall of the sinus, and showed atheroma and irregularities of calibre. Even supposing that an unrecognised cause of general arteriosclerosis co-existed, there could hardly be any doubt that the sinus condition contributed to the pathological changes in the cerebral arteries.

T. B. LAYTON said that chronic sphenoidal sinus suppuration must be very rare; he had never yet absolutely assured himself that he had seen such a case.

That brought one to a consideration of the criteria on which the diagnosis was made. There was, on one hand, the diagnosis according to P. Watson-Williams and, on the other hand, the diagnosis according to Hajek. According to the latter, it was necessary to remove the posterior end of the middle turbinal bone, and then, a fortnight later, to examine the nose and to deal with the pus in the superior meatus, in the same critical way as one dealt with pus in the middle meatus when diagnosing an anterior sinusitis and to see whether it returned after it had been wiped away. If it did, one suspected that it came either from the sphenoidal sinus or the posterior ethmoidal sinus and then, by putting a little plug into the opening of the sphenoidal sinus and leaving it there from twelve to twenty-four hours, one made the diagnosis on what was then found. The question as to whether chronic suppuration of the sphenoidal sinus was common or was extraordinarily rare depended upon which of the diagnostic methods which he had mentioned one was prepared to rely on. He was not prepared to trust the Watson-Williams method of diagnosis by itself. It might be of value for leading one down to those cases which should be critically examined by Hajek's method, but the Watson-Williams method should not be used alone to diagnose suppuration of the sphenoidal sinus, and any work based upon that diagnosis could not be accepted. The report of the Board of Control stated that everyone doing this work must indicate in his report the exact technique upon which he had based his diagnosis, and unless in his (the speaker's) remaining years of practice he had reason to change his views, he would look with extreme scepticism upon work which had not been based upon the more careful and accurate diagnosis laid down by Hajek, or some process closely resembling it.

W. S. THACKER NEVILLE said that several years ago Proetz, of America, said that one could suck air out of a sinus and replace

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the air with drugs. Le Mée had introduced this method into France, and showed many cases in Paris. If it was true that one could suck air out of a sinus and put drugs in, it was better to do this than to give a spray of ephedrine. Every nasal patient who came to his (the speaker's) out-patient department was submitted to this method of investigation, no matter what was the matter with him. He cocainised the nose slightly, and told the patient to lie on a couch with the head back and the chin in line with the external auditory meatus; he then put in equal parts of lipiodol and olive oil, shut the opposite nostril, and asked the patient to say "K"; he used 10 lb. negative pressure. Then, by making the patient assume various postures, he induced lipiodol to enter the sphenoidal, maxillary and ethmoidal sinuses. He had never got it into the frontal sinus except in one case, on which he had already operated. The method was useless for diagnosing the thickness of the lining membrane of the sinuses, as the sinuses could not be filled by this method. As drugs could be made to stay in for four or five days, it was a good plan to fill the sinus periodically with ephedrine sulphate (8 c.cm. of a 0·5 per cent solution in saline) or with liquid paraffin. Lipiodol was used merely for investigation, and was useless for treatment. A pressure of not more than 1 lb. should be used at first in an acute case. An increase up to 10 lb. was quite bearable as the patient's condition improved.

J. A. GIBB said that he agreed with Mr. Layton. He had performed more than 2,000 operations on the nasal sinuses, but only six on the sphenoid, and in not more than twelve cases had he found disease in the sphenoid. He had operated in nine cases of retrobulbar neuritis, all cures. He had shown one at this meeting here to-day which had the classical features of retrobulbar neuritis. The vision was $\frac{6}{60}$ in the right eye, $\frac{6}{36}$ in the left, and in both eyes there was a complete scotoma for colours. Pus was exuding from both sphenoids; they were both opened, but with no result. There was pus in both maxillary antra; both were opened with no result. The patient was sent to a convalescent home for a time, and returned with the vision worse. After allowing the patient to rest, he opened both anterior ethmoids, with the result that there was a rapid recovery of vision.

E. D. D. DAVIS said he still maintained that in retrobulbar neuritis arising from nasal disease there were changes in the optic disc, and that it was an optic neuritis rather than loss of sight without physical signs. In such cases the disease in the sphenoid or posterior ethmoidal cells was obvious to the rhinologist. Œdema and pus could be seen in the sphenoidal region, and these sinuses would then be explored and drained. He did not consider that, in cases in which there were no physical signs and the skiagrams and aspiration were negative, retrobulbar neuritis was caused by

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nasal disease. Even then, if the neuritis progressed, the posterior nasal sinuses could be explored.

Œdema of the eyelids and of the orbit, diagnosed as orbital cellulitis, was sometimes treated by extensive incisions along the supra-orbital and infra-orbital margins, which led to permanent œdema of the lower eyelid and disfigurement. The majority of the cases of orbital cellulitis were due to nasal suppuration, and the nose should be attacked first and, at a later stage or if necessary at the same sitting, a limited incision could be made at the inner canthus of the eye, particularly if there was displacement of the eyeball.

W. STIRK ADAMS said the only facts which would convince Mr. Layton were those of morbid anatomy. If Mr. Layton would carry out serial *post mortem* examinations in hospital, opening every sphenoid whenever the head was being investigated, he would find more cases of sphenoidal sinus suppuration than he had been diagnosing. He (the speaker) had used the Watson-Williams technique, which had been taught to him by the President, and he had seen no reason for mistrusting it. Suppuration was not, however, the only evidence obtainable of inflammation ; there occurred a thickening of the lining membrane, which had not so far been mentioned ; that thickening, if present, could easily be felt by means of a trocar placed in the sphenoid.

BEDFORD RUSSELL said that at St. Bartholomew's Hospital extensive use had been made of the Proetz displacement method, from the diagnostic point of view, by the introduction of lipiodol. It was remarkably easy to discover a thickened lining membrane, and to find whether lipiodol was retained for longer than the seventy-two hours which Proetz had laid down as approximately the normal time. The method had also been used in the hospital for the treatment of headaches apparently due to sphenoidal or posterior ethmoidal disease. In some cases headaches had been cured easily by three instillations of ephedrine and saline.

CASES

Sphenoidal Sinusitis.—MUSGRAVE WOODMAN (President).

J.S., 39, male, was admitted with a diagnosis of a probable intracranial neoplasm.

He complained of headaches, which had been increasing in intensity for four years, causing some vomiting, affection of speech, and increased prominence of the eyes.

On examination.—A bad deviation of the septum to the right side was found, making a view of the posterior sinuses impossible on that side. A skiagram showed dullness of the right antrum and sphenoid.

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The septum was straightened and was found to have entirely prevented drainage on the right side. The right sphenoid was drained.

The symptoms definitely diminished after a few days. A fortnight ago the patient reported that he was perfectly well, free from pain, and back at work.

Sphenoidal and Ethmoidal Sinusitis with Hemianopia.—MUSGRAVE WOODMAN.

H.W., female, aged 56, came to hospital complaining of severe pain round each eye, frontal headaches and defective vision.

On examination.—A bilateral papillœdema was found most marked on the left side. This disappeared but a bi-nasal defect of the visual field remained. There was some post-nasal infection, the left antrum was dull on transillumination and a skiagram showed some haziness of the left posterior ethmoidal region.

On examination of the sinuses by suction puncture the wash-out from the left sphenoid was found to be hæmorrhagic. Cultures were made from the contents of the different sinuses, and *Staphylococcus aureus* grew on those from the left ethmoid and sphenoid. The pain diminished afterwards and there was some improvement in vision.

A fortnight later the left sphenoid was again washed out and a radical operation was performed.

The pain entirely disappeared after this and when the patient was seen a week ago the visual fields were almost normal.

Polypoid Ethmoiditis associated with Ipsiloteral and Progressive Loss of Vision.—F. J. CLEMINSON.

Female, aged 56. In *November*, 1923, this patient consulted Sir Arnold Lawson on account of failing vision in the right eye, with signs of retrobulbar neuritis. There was a long history of "nasal catarrh", for which she was referred to the Exhibitor. The right side of the nose contained a mass of polypi bathed in pus and arising from the ethmoid.

At operation the ethmoid was exenterated and the orbital plate, like most of the remainder of the bone, was found to be carious, and a small area of orbital fat was exposed. An orbital abscess developed and was opened by Sir Arnold Lawson six days later. Three weeks afterwards the patient was discharged healed. The vision had recovered its normal acuity in *January*, 1924, and there has been no recurrence of the polypi. During the last year she has had what she described as occasional slight "giddiness".

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Abstracts

Right Sphenoidal Sinusitis.—A. LOWNDES YATES.

Female, aged 38. Pain over right frontal and right occipital and mastoid region, six years ago. Pain ceased for two years after submucous resection of the septum and then recurred and was treated by repeated applications of cocaine. Injection of the sphenopalatine ganglion was refused by the patient. When first seen one year ago, 1 c.cm. of pus was washed out from the sphenoidal sinus and this was followed by relief of symptoms for one year. Three months ago the pain returned and was treated three weeks ago by displacement with relief of symptoms. All instrumental measures in the nose have caused reaction and the lysozyme factor in the discharge is low, the micro-organisms multiplying in the fluid. Operation has for this reason been deferred.

ABSTRACTS

EAR

Changes in the Auditory Apparatus in a Case of Bilateral Acoustic Tumour. DR. T. GERMAN (Recklinghausen). (*Monatsschrift für Ohrenheilkunde*, May, 1932.)

The frequency of the development of tumours in connection with the auditory nerves in contra-distinction to the other cranial nerves, and the bilateral situation in this disease, is of course well recognised. The author states that the cause of this predilection lies in the fact that in the neighbourhood of the cranial opening which transmits the nerves, embryonic fibrous tissue occurs between the nerve fibres, and especially, also, in the vestibular nerve at the point at which it divides into the superior and inferior branches.

The main reason for the publication of this case was the fact that although some thirty similar cases have already been published, according to the author, the number of those which had been subjected to histological investigation was extremely small.

Two components enter into the formation of these tumours: (1) Fibrous tissue, as is found elsewhere, and (2) a tissue which is a structure identical with the supporting tissue of the peripheral nerves.

The case on which the article is based, was that of a girl, aged 17, who first came under observation on December 19th, 1929. As the result of diseases during childhood, she was under-developed and so weak that she had to leave her school. Latterly, she had rapidly lost weight. She complained of evening headaches, with frequent vomiting after eating, dizziness and shivering whilst,

https://doi.org/10.1017/S002221510003930X Published online by Cambridge University Press