sinuses to that of the hollow spaces created by inspiratory pressure, *e.g.* the pulmonary alveoli. (4) The direction of the inspiratory and expiratory currents and the post-natal anatomical conditions. (5) The nature of the lining membrane of the accessory sinuses support the same view. Clinical and pathological observations also favour the theory that variations in air-pressure can exercise an important influence on the formation of the accessory sinuses. These different points were further elaborated, but do not lend themselves to a short abstract.

Dr. SCHOENEMANN attributed the formation of the pneumatic accessory sinuses to the ingrowth of more or less solid epithelial buds into the depths, and their later differentiation into air-containing sacs. He thought that the development of the pneumatic facial sinuses was not to be regarded as different from that of the pneumatisation of other bones, especially the petrous bone; in this latter case the direct result of respiratory pressure need not be considered.

Dr. KILLIAN pointed out that this difficult question could only be solved by original research and mastery of the literature of the subject. The development of animal and human body-forms was in the first place governed by the laws of phylogenesis and onto-genesis. The influence of air-pressure could hardly possess formative value: a large series of examples from the animal world showed that accessory sinuses existed in cases in which the influence of air-pressure could be excluded from the beginning.

(J. S. FRASER, Edinburgh, *trans.*)

(To be continued.)

AUSTRIAN OTOLOGICAL SOCIETY.

December 14, 1908; *Monats. f. Ohren., year* 43, *vol.* 4.

PROFESSOR POLITZER *in the Chair.*

Abstract of the Proceedings.

ON THE QUESTION OF THE DIFFERENTIAL DIAGNOSIS BETWEEN CEREBELLAR ABSCESS AND SEROUS LABYRINTHITIS.

BY DR. E. RUTTIN.

(1) A butcher's apprentice, aged eighteen, first seen at the clinic on November 4, 1908. For the last eight years he had

https://doi.org/10.1017/S1755146300183763 Published online by Cambridge University Press

had a discharge from the left ear off and on; history of pain and giddiness for three to four weeks.

Present Condition.—Total destruction of the left middle ear. Granulations, cholesteatoma. Conversation (Bárány's noise-apparatus) 1 m., whisper *ad concham*. Weber right, Rinne negative. Bone-conduction shortened, C 1, C 4 not heard. No spontaneous nystagmus. On inclining the head backwards nystagmus to the right. Fistula symptom positive, but reversed, that is, compression produced a marked horizontal nystagmus to the right, and aspiration a weaker nystagmus to the left. Typical caloric reaction. Temperature normal.

November 10.—As there was still some hearing left and the reaction was as described only a radical operation was performed. A large cholesteatoma was found in the antrum and a fistula in the horizontal semi-circular canal. The temperature rose to 38° F. in the next few days, with headache, strong nystagmus to the sound side, some rigidity of the neck and tenderness over the cervical vertebræ. On changing the dressings the ear was shown to be completely deaf and the caloric reaction was lost. On November 13 the labyrinth operation was undertaken. During the next six days the temperature fell, pulse about 100; the patient felt well; no more tenderness of the cervical region. Nystagmus to the sound side. On the seventh day a sudden attack of headache occurred, with slight nystagmus to the diseased side and vomiting; temperature normal, pulse 70. November 20: The patient was apathetic in the morning; obvious nystagmus to both sides. In the afternoon he had quite recovered and played cards. November 21: Pain at the back of the head; neck held stiff, but no rigidity of the neck; nystagmus of varying intensity to the left. November 22: Occipital headache, rigidity of the neck, apathy. Marked nystagmus to the left. Lumbar puncture, clear, pulse 68. Ruttin then made an incision into the cerebellum behind the posterior aspect of the petrous bone and opened an abscess the size of a plum situate in the left hemisphere. November 25: Death.

Post-mortem (by Prof. Stork).—Abscess of the left cerebellar hemisphere draining well and efficiently. Œdema of the adjacent brain tissue, hæmorrhagic encephalitis of the posterior part of the corpus callosum, flattening of the convolutions, no meningitis. *Streptococcus pyogenes* was found in the pus.

(2) *Cerebellar Abscess and Serous Labyrinthitis.*—A man, aged sixty-eight, was admitted to the clinic on October 15. Recurrent discharge from left ear for twenty years. Some swelling behind

https://doi.org/10.1017/S1755146300183763 Published online by Cambridge University Press

the left ear for the last five months. Giddiness for the last fortnight, and vomiting with headache for the last twenty-four hours.

Present Condition.—Sagging of the posterior superior wall of the meatus; tympanic membrane injected and swollen; no perforation detected. Conversation (Bárány's noise apparatus) *ad conch.* Whisper not heard. The middle tuning-forks not heard even when struck hard. Nystagmus varying; sometimes none observable, sometimes to the right, sometimes to the left, and then always rotatory. When the head was inclined backwards a rotatory nystagmus occurred to the left, when inclined to the left a rotatory nystagmus to the same side, when inclined to the right a rotatory nystagmus towards the right. Only a very slight suggestion of a fistula symptom. Caloric reaction very marked and of long duration. Temperature normal.

At an operation performed on October 20 a large extra-dural abscess was revealed around the sinus in the posterior fossa, but no fistula was detected, in spite of careful search with the help of adrenalin (tonogen). The next day the patient was quite comfortable, but on the 22nd a very obvious rotatory nystagmus occurred to the right whichever way the eyes were directed, and he lay on the right side. The dressings were changed, and the left ear was shown to be totally deaf with Bárány's noise apparatus. Weber to the left; C4 just heard. Reaction with hot normal saline solution elicited. Marked spontaneous giddiness. Vomiting when sat up. Little alteration in the condition took place till the 27th, when he suddenly became unconscious; some slight convulsive movements of the right hand and fingers; pupils contracted and did not react. No nystagmus, no deviation, temperature normal, pulse 120. Ocular fundus normal.

Ruttin then performed the labyrinth operation, and at the same time opened the cerebellum immediately behind the petrous bone, where he found an abscess containing thick, yellow, non-fœtid pus. A counter-opening was made behind the sinus. Examination of the cavity revealed another smaller abscess further back in the cerebellum. About one hour after the operation the patient regained consciousness, and four hours later Ruttin made the following note: "Rotatory nystagmus to the right; pupils reacted sluggishly both to light and to accommodation. No involvement of the ocular muscles, corneal reflex brisk, speech husky, temperature normal. Patellar reflex lively, plantar reflex extensor, deep reflexes not elicited; ataxia of the left side, especially in the upper limb; epigastric and cremasteric reflexes easily obtained on

https://doi.org/10.1017/S1755146300183763 Published online by Cambridge University Press

the right side but absent on the left, sensation normal; pulse 104." On the 29th the patient became unconscious. Eyes deviated to the left, slight nystagmus to the right, pupils contracted and did not react, temperature 40° F., pulse 104 and intermittent. On examination no pus was found in the abscess cavity. A cloudy fluid was drawn off under slight pressure by lumbar puncture. October 30: Death.

At the *post-mortem* examination the abscess appeared to be well drained, but there was some purulent meningitis, and *Streptococcus mucosus* was found both in the cerebro-spinal fluid and in the abscess cavity.

These two cases show how difficult the diagnosis of a cerebellar abscess may be if in addition to the abscess one is dealing with a fistula of the labyrinth or a serous labyrinthitis. According to Neumann and Bárány nystagmus directed towards the diseased side is a fairly reliable indication of a cerebellar abscess in cases where this condition is combined with diffuse purulent labyrinthitis. On the other hand we know that nystagmus directed towards the diseased side can be elicited in cases of labyrinth fistulæ or in serous labyrinthitis. This nystagmus is especially marked if the patient is sat up or during movements of the head, and in this respect it resembles nystagmus due to intra-cranial lesions, but it may also be produced if the caloric reaction is lost, as he (Ruttin) had shown at the previous meeting.

In the first case the nystagmus towards the diseased side which occurred on movements of the head before the operation might have been dependent either on the labyrinth or on the cerebellum, but the nystagmus which occurred spontaneously after the operation on the sixth day could only have been due to either an incipient meningitis or to a cerebellar abscess as the labyrinth had then been removed. The varying character of the nystagmus and also the clear fluid obtained on lumbar puncture, as well as the good general condition of the patient, all pointed to the presence of a cerebellar abscess, as, indeed, the operation had proved.

In the second case a typical serious labyrinthitis eventuated after the performance of the radical operation. Whilst, however, the symptoms of this labyrinthitis, especially the marked nystagmus directed towards the sound side, were diminishing, there appeared suddenly on the fifth day after the operation a nystagmus directed towards the diseased side. This nystagmus might of course have been dependent on the labyrinthitis still, but the fact that this

https://doi.org/10.1017/S1755146300183763 Published online by Cambridge University Press

condition was already apparently subsiding aroused the suspicion of a cerebellar abscess, and the operation in this case, too, corroborated the correctness of that view.

Ruttin considered that we must still perform the labyrinth operation in cases where there is reason to suspect the presence of a cerebellar abscess, and that the labyrinth should be opened not only in cases of diffuse purulent labyrinthitis but also when there is a fistula or serous effusion of the labyrinth, and that this procedure is best carried out according to Neumann's suggestion by opening the posterior fossa at the same time. That the hearing in these cases is almost always reduced to a minimum is all the more reason for this advice.

(3) *Cerebellar Abscess produced by an Unusual Mode of Infection, and Compression of the Fourth Ventricle.*—A child, aged five, was admitted to the clinic on November 11 in an apathetic condition. The parents stated that there had been an aural discharge for three weeks and that for four weeks he had been vomiting.

Present condition: A large perforation in the anterior inferior quadrant of the right membrane, at present dry. Caloric reaction prompt. Left ear normal. The child was unconscious. Neck stiff and the head bent backwards to its greatest extent. The child cried out from time to time. Feeding was only possible *per rectum*. Deviation of the eyes at first towards the right, later to the left; slight convulsive movements of the right extremities, some paresis of the right facial nerve. The unconsciousness gave way to a condition of apathy. (?) Some hyperalgesia of the right lower limb. Abdomen indrawn. Kernig's sign positive. Ocular fundi and other organs normal. A diagnosis was made of basal meningitis with involvement of the right Rolandic area or cerebellar abscess. The parents declined an operation, which was repeatedly recommended. The condition of the child did not change during its stay in hospital till the tenth day after its admission, when it died.

Autopsy: Abscess of the right cerebellar hemisphere the size of a plum immediately beneath the surface towards the base, with compression of the fourth ventricle and consequent internal hydrocephalus. Some purulent extra-dural inflammation around the right sigmoid sinus, but no thrombosis of the sinus itself. Further investigation showed that the pus had tracked between the two tables of the temporal bone from the mastoid process and thus infected the cerebellum. We know that the usual route for this to take place is *viâ* the labyrinth; this mode of infection in which the

https://doi.org/10.1017/S1755146300183763 Published online by Cambridge University Press

labyrinth escapes is certainly more uncommon. The compression of the fourth ventricle, which was probably the immediate cause of death, is interesting.

(4) *An Otitic Cerebral Abscess in an Unusual Situation.*—A cook, aged thirty-three, admitted August the 4th, 1908. According to the account of his friends his condition during the last two days had varied between apathy and irritability. He had had a discharge for a long while from the right ear, on which an operation had at some time been performed.

Present condition: He is for the most part irresponsive, but answers questions though his replies are delayed; at times he speaks very brightly and spontaneously; yawns repeatedly and drops off to sleep. The left ear discharged a fœtid pus; it had been submitted to the complete post-aural operation. Right ear normal. Whisper heard, Weber to the left, C1 and C4 positive. Rinne not obtainable, caloric response prompt. Data as to the eye movements were difficult to ascertain, but when he spontaneously turned his eyes to the left a left-directed spontaneous nystagmus ensued. Right half of the head had evidently impaired sensation. Left epigastric and cremasteric reflex present. Pulse 60; ocular fundi, other organs and temperature normal. Lumbar puncture showed a clear fluid with no bacteria. A cerebral abscess was diagnosed, and the middle and posterior fossæ of the skull exposed freely. Some pachymeningitis was observed of the dura in the middle fossa, but no abscess was discovered in this situation nor in the cerebellum. The next day he was considerably improved, was quiet, and ate and drank with relish, and during the following five days he had periods of irritability varying with lucid intervals. Death occurred suddenly on the sixth day.

Post-mortem examination: Two abscesses about 3 cm. in diameter were found in the left cerebral hemisphere containing fœtid pus. Their walls were thick and a purulent lepto- and pachymeningitis obtained in their neighbourhood. Chronic tuberculosis of the left pulmonary apex with a small cavity. In the pus of the abscess were numerous long Gram-negative bacilli. The direction of the incision had been accurately planned, but had not been carried deep enough as the abscess was almost 8 cm. from the ear. The infection had been carried by the blood or lymph-currents, and was not the result of direct extension from the original seat of disease.

Alt, having remarked on the dangers attendant on the treatment of cerebellar abscesses during operation, quoted a case of his

https://doi.org/10.1017/S1755146300183763 Published online by Cambridge University Press

own in which breathing ceased five minutes after the anæsthetic was commenced; artificial respiration was necessary for ten minutes. At the conclusion of the operation artificial respiration had again to be employed for three quarters of an hour, and a quarter of an hour later when the patient had been brought to the ward once more repeated, but he died in spite of the continued adoption of this method for two and three quarter hours. The *post-mortem* revealed a chronic hydrocephalus. Ruttin's case was interesting in that death did not take place till two days afterwards. He considered that more attention should be devoted to the brain-pressure in cases of cerebral abscesses, and that repeated lumbar puncture or puncture of the ventricles was of advantage in some instances.

Neumann was glad that the importance of a nystagmus directed to the diseased side in cerebellar abscess had been emphasised. He regarded the cause of death in these cases to be the increasing encephalitis and not the raised intra-cranial pressure, and did not agree with the suggestion that repeated punctures should be made, which might be a source of danger in certain cases.

Ruttin replied.

Specimen of a Hairy Polypus of the Ear.

By E. Urbanschitsch.

Patient was a man, aged fifty, who reported that he had never been ill and had had no pain or discharge from the ear. A few days before he had noticed two spots of blood on the pillow and he had come merely to ask the reason. A cholesteatoma was found in the meatus and tympanic cavity, but no trace of pus. When this was removed a polypus was observed issuing from the inner wall of the antrum covered all over with fair hair. It was composed of granulation tissue and no papillæ could be found, but the hair appeared to be, as it were, included in the substance of the polypus.

Some Cases Illustrating a New Symptom of Oto-sclerosis.

By E. Fröschels.

The exhibitor maintained that the sensation of tickling, which one could easily elicit in normal ears, was absent or much reduced in cases of oto-sclerosis, and he showed as clinical evidence some patients in whom this symptom was present on the side thus affected and absent on the other, which as yet was not involved.

https://doi.org/10.1017/S1755146300183763 Published online by Cambridge University Press

Leidler asked if the sensation of the whole side of the face had been tested, as he had found that patients suffering from oto-sclerosis could appreciate hot air at a temperature of 60° on the sound side, whilst it caused no sensation on the diseased side.

D. Kaufmann, in remarking on the interest of this observation, suggested that Fröschels must be describing other cases than those usually included under the term "oto-sclerosis," as it was most unusual to meet with instances of this disease on one side only, and especially in old people, and he submitted that this test must be further investigated before its real worth could be ascertained.

Ruttin did not think that Kaufmann's objection could be accepted, as both he and Bárány had been able to corroborate the presence of oto-sclerosis in many of Fröschels' cases. The symptom had been only shown in advanced cases; whether it also occurred as an early symptom yet remained to be proved.

Frey pointed out that perhaps the condition was functional, and reminded the meeting that these patients are largely of a neurasthenic disposition.

Neumann also thought that the symptom in question necessitated a longer test before its value could be determined.

Fröschels replied that he had only regarded this symptom as pathognomonic when he had found the sensibility to tickling differ on the two sides of the head, and when the defect in hearing was regarded as probably due to oto-sclerosis.

Alex. R. Tweedie (*trans.*).

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Fifteenth Annual Meeting.

Dr. Christian Holmes (*Cincinnati*), *President, in the Chair.*

(*Continued from page* 511.)

Infectious and Inflammatory Complications and Sequelæ following Intra-nasal and Pharyngeal Operations, and How to Prevent Them.

By Dr. William L. Ballenger (Chicago).

According to the author's observations nearly all the inflammatory complications and sequelæ following intra-nasal and

https://doi.org/10.1017/S1755146300183763 Published online by Cambridge University Press