and there was a further loss of about 2 c.c. (The technique of Hirsch was followed.) Cerebrospinal fluid was then suspected and the operation was stopped. Examination showed the fluid to contain globulins and albumins, but no sugar. Twenty-four hours after operation, the patient complained of headache and there was slight neck retraction. Morphia gr. $\frac{1}{12}$ was administered. At seven o'clock the following morning, respiration suddenly failed. Camphor by injection and oxygen inhalation with artificial respiration, were given. Within an hour there was complete restoration of the respiratory function, but five hours later she had another failure of respiration and died.

At the post-mortem examination on the same day, the bones of the vault showed definite pressure erosion. The floor of the third ventricle bulged forward into an enlarged pituitary fossa, and the pituitary gland was flattened and lay against the upper part of the anterior wall of the fossa. There was marked internal hydrocephalus and a large cyst of the vermis of the cerebellum. The absorption of bone on the floor of the middle fossa was well marked. There was a spherical bulging behind the optic chiasma.

SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY.

May 5, 1928.

President—J. S. FRASER, F.R.C.S.E.

The Histo-Pathology of Mastoiditis—J. P. STEWART, M.D.

The Paper is published in the *Journal of Laryngology and Otology*, Vol. xliii., p. 689, October 1928.

DISCUSSION.

Dr J. S. FRASER (President) said that Mr Stewart had suggested that a pneumatic mastoid might, as a result of inflammation, become a dense one. He (the President) thought this might possibly—but very rarely—occur. In a case of severe mastoiditis in the pneumatic type of bone, the inflammatory process would be almost certain to come to the surface over the antrum or break through the tip or the posterior root of the zygoma, or at some other point, and so become a manifest mastoiditis which required operation.

https://doi.org/10.1017/S0022215100032631 Published online by Cambridge University Press

From this paper it appeared that there were two things to be considered in mastoiditis. First, the inflammation or empyema of the air-cell itself; secondly, the changes which occurred in the Haversian systems. The first could be seen macroscopically at operation, but to many clinical otologists the widening of the Haversian systems by osteoclastic formation was probably new.

Mr SOMERVILLE HASTINGS asked on what evidence Mr Stewart described it as a continuous process. Had he the exact history of the mastoid symptoms in each case?

Dr KERR LOVE said that there were cases in which mastoiditis seemed to have converted a large pneumatic mastoid into a process in which it was difficult to find the antrum. That might have been due, in some of the cases, to imperfect surgical technique, as in discovering a very small antrum. His belief was that the tympanic antrum was present in every case, though he had met with cases in which he could find nothing but a single cell. That was before he began to X-ray mastoid processes—in the bone itself, not in the patient. When he found that the mastoid process, in practically every case in which he did this, was almost entirely composed of cells, he became very doubtful with regard to this process of conversion of a pneumatic process into an almost solid mastoid process. The present demonstration seemed to show how the change came about, and the question was whether it was as rare as the President said, and whether it might not be the result of disease.

Mr C. S. RIDOUT said that some time ago he had had a patient (a colleague's son) who, while at school, had suffered from pain in the ear and over the mastoid. No active treatment had been carried out, and when he returned from school the ear was still rather painful, though the temperature was not raised. There was tenderness at one spot over the mastoid, but the middle-ear appeared normal. A radiogram showed some haziness at one spot, at the posterior aspect of the mastoid. He (Mr Ridout) had advised operation. In one group of cells a small quantity of pus was found; the remainder of the mastoid was healthy. He (the speaker) thought there had been otitis media spreading into the mastoid, and that this had cleared up, leaving the posterior group of cells infected.

Mr STEWART (in reply to Mr Somerville Hastings) said that the results were obtained from material from fifty cases, operated on at periods varying from three days to three months, so that a good idea of the changes in the mastoid process was obtained.

In reply to Dr Kerr Love, absence of the tympanic antrum had been met with but only rarely.

With regard to the density of the mastoid: if an otitis media developed in infancy, new bone processes were formed in the cells around the antrum, hindering the epithelial sac from going further, so that the mastoid bone never became hollowed out. He regarded otitis media as responsible for the condition. It was impossible to differentiate between diseased and healthy tissue during operation. Neumann's advice was to remove all the tissue so as to be on the safe side. Occasionally the operator could not reach some cells around the labyrinth. According to Bezold, in

https://doi.org/10.1017/S0022215100032631 Published online by Cambridge University Press

acute otitis media there was also an acute inflammation in the mastoid air-cells, and therefore there could be no localisation of the disease such as there was in appendicitis.

In those cases in which, on opening the mastoid, one found plum-coloured granulations and no pus, the condition was usually due to influenza; in these cases one should wait as long as possible before operating. One school advised early operation, the other school believed in waiting as long as possible. He inclined to the waiting policy, so that the disease process might become shut off by a healthy barrier. An exception was to be made when the condition was critical and there was danger of an intracranial complication.

A Case of Spherical Bulging of the Floor of the Third Ventricle, Secondary to Internal Hydrocephalus and Simulating Pituitary Tumour—R. GRAHAM BROWN.

The case is published in the *Journal of Laryngology and Otology*, Vol. xliii., p. 728, October 1928.

DISCUSSION.

Mr HUGH CAIRNS said that in making this freely acknowledged error of diagnosis, Mr Graham Brown was in good company, for practically every neurological surgeon, at some time or other, committed the mistake of exploring the pituitary fossa in a case of midline cerebellar tumour. The mechanism by which the false localising signs were produced was clear. In all cases of hydrocephalus, particularly when due to tumour of the vermis, there was a bulging of the third ventricle on to the roof of the sella turcica. At necropsy, in cases of acute hydrocephalus, one could see behind the stalk of the hypophysis, a sharp depression in the diaphragma sellæ. Continued pressure in this region resulted in dilatation of the pituitary fossa, which simulated, radiographically, the enlargement produced by hypophyseal tumour.

False localising signs were not limited to radiological appearances, but also occurred in the endocrine disorders. Just as menstruation failed to occur in Mr Graham Brown's patient, so in older women, amenorrhœa was one of the earliest symptoms. He (Mr Cairns) had recently been asked to see a girl who was supposed to have a pituitary tumour. The girl had amenorrhœa, headaches, loss of vision and enlarged sella turcica, and this combination had led to a diagnosis of pituitary tumour. However, there was a history of vomiting at the onset of the illness, and on examination generalised hypotonia (rather more marked on one side than on the other), slight unsteadiness in walking, and a high degree of papillœdema, and in spite of the absence of gross cerebellar dysfunction he had made a diagnosis of tumour of the vermis and had explored the posterior fossa. On splitting the vermis he had found on the right side of the fourth ventricle a tough vascular glioma, part of which he removed. The fact that the menstrual periods had reappeared three months after the operation could be taken as evidence that the amenorrhœa was produced by the hydrocephalus, for, at operation, although only a part of the tumour had been removed, the obstruction to outflow of the cerebrospinal fluid had been, for the time at least, completely relieved.

https://doi.org/10.1017/S0022215100032631 Published online by Cambridge University Press

In cases of cerebellar tumour in which there was a long history, obesity was a common feature, and if papillœdema had been allowed to go on so long as to result in subsidence of the swelling, with optic atrophy and blindness, the resemblance to pituitary tumour might be still more close than in the case which Mr Graham Brown had described. Diagnosis was not made easier by the fact that suprasellar tumours occasionally simulated cerebellar tumours very closely.

It was usually possible to distinguish radiologically between the enlarged sella turcica of pituitary tumour and the enlargement that was due to hydrocephalus. In hydrocephalus the destruction of bone was usually confined to the clinoid processes and the dorsum sellæ, whereas in pituitary tumours it was in the floor of the sella that the destruction of bone was greatest. The visual fields were of great value, especially when measured with small visual angles. Vomiting in the early stages suggested strongly that the tumour was cerebellar rather than hypophyseal.

Chronic Suppurative Otitis Media with Lateral Sinus Thrombosis and Cerebellar Abscess — L. GRAHAM BROWN, F.R.C.S.—Male, aged 17, complained of right otorrhœa of two to three years' duration. A large polypus was removed and cleansing treatment ordered.

4th February 1926.—Admitted to hospital for removal of tonsils and adenoids; aural discharge lessening.

22nd July.—Admitted again as emergency case of acute mastoiditis. Rigor occurred soon after admission. Diagnosis of lateral sinus thrombosis was made. Operation: extensive removal of necrosed bone; extradural abscess found with gangrenous lateral sinus thrombosis. Internal jugular vein divided between ligatures in neck; healthy lateral sinus exposed far backwards towards occiput and plugged. Wound partly closed in horizontal portion of incision but remainder left open.

24th July.—Rigor occurred, then swinging temperature until 13th August, when wound was reopened, pus and granulations removed and radical mastoid operation completed.

23rd August.—Evening rise of temperature continued, with slight irritating cough. Chest and sputum examination negative, but X-ray report typical of tuberculous involvement of apex of left lung.

27th August.—Patient complained of frontal headache on moving, and vomited several times, but not independently of meals.

1st September.—For several days previously temperature irregularly sub-normal, pulse slow and full, vomiting and headache, much wasting and drowsiness.

Examination of central nervous system, including cerebellar functions: nothing definitely abnormal found.

6th September. — Symptoms of cerebellar abscess now definite. Operation: wound which had now almost healed was reopened and cerebellum explored with sinus forceps in site of the horizontal limb of the obliterated sigmoid. Immediate gush of pus about half an ounce.

https://doi.org/10.1017/S0022215100032631 Published online by Cambridge University Press

Rubber drainage-tube inserted without further disturbing surrounding parts and wound left open.

11*th September*. — Marked recovery from cerebellar symptoms occurred from this date and no sequelæ remained.

16*th January* 1928.—Slight moisture of mastoid cavity.

Mr A. R. TWEEDIE said he noted that the tympanic membrane was still present, and that there appeared to be a suppurative lesion in the anterior part of the attic.

Dr KERR LOVE said he thought the tympanic membrane was intact, but there was a discharge in the middle-ear, and perhaps also from the antrum. He thought the intratympanic syringe should be pointed upwards and backwards, and the middle-ear and antrum cleansed. Then there would be healing, unless there was discharge from the upper end of the Eustachian tube. He did not think the Eustachian tube discharge accounted for the unhealed condition.

Severe Aural Vertigo treated by Superior and Inferior Vestibulotomy—E. D. D. DAVIS, F.R.C.S.—Married woman, aged 33, was incapacitated by aural vertigo and tinnitus of some months' duration.

In 1914 a radical mastoid operation was performed on both ears by Mr Yearsley.

Both ears had healed perfectly, but there was very slight moisture from the Eustachian tube on the left side; no nystagmus; no fistula phenomena; a tendency to fall to left.

Patient very deaf, voice heard at 2 feet only from each ear; bone-conduction normal; both labyrinths equally active to the irrigation test; the hearing of each ear appeared to be equal. Lumbar puncture; normal tension, normal fluid; no effect on the vertigo. No other cause for the vertigo found apart from the ear condition. All kinds of palliative treatment tried.

17*th November* 1927.—A right superior and inferior vestibulotomy with curetting of the vestibule carried out. The operation was easily and quickly done. After operation vomiting was excessive, with a riotous rotatory nystagmus in all directions, but more marked on looking away from the right (operated) ear. The nystagmus became much less in a few days and could only be obtained on looking to the left.

Pulse and temperature remained normal throughout.

Patient left hospital after three weeks with no improvement in the vertigo and tinnitus; gait very unsteady.

23*rd February* 1928.—Patient readmitted; a left superior and inferior vestibulotomy with curetting performed.

No post-operative vomiting, slight nystagmus on looking to the right.

3*rd April* 1928.—Patient much better and appears to have derived considerable benefit from the second operation.

https://doi.org/10.1017/S0022215100032631 Published online by Cambridge University Press

Dr J. S. FRASER (President) said that from these cases one could learn the value or otherwise of operations on the inner ear in patients suffering from tinnitus and vertigo. His own limited experience was that the tinnitus cases were certainly better left alone. It was still a debatable matter whether the vertigo cases should be operated upon, except in a few well-recognised conditions, such as labyrinth fistula and tumour of the 8th nerve. The diagnosis of disease of the otolith apparatus, hypertension in the labyrinthine fluid, dilatation of the saccus endolymphaticus and serous meningitis in the lateral cistern was still a matter of great difficulty.

Dr ALBERT A. GRAY said he would be averse to operating on the middle-ear with the object of curing tinnitus, though it might be done for giddiness. Tinnitus was frequently of central origin; operation on the middle-ear and cochlea did not always cure it.

Mr E. D. D. DAVIS (in reply) said it was difficult to find records of operations of this kind. Mr Lake's view was that they were of no use. He (Mr Davis) had been asked why the auditory nerve could not be destroyed to relieve severe tinnitus; hence this attempt. The patient suffered very much from vertigo, complaining but little of tinnitus, and he (the speaker) thought it a favourable case. There was improvement for a time, but the symptoms had returned and now there was more tinnitus. It was easier to decide upon the operation in these cases because the radical mastoid operations had been done and the wounds had healed satisfactorily. The operation was easy; it took less than twenty minutes. Strict antiseptic and aseptic precautions were taken at the operation and during the dressings.

Temporal Muscle Grafts in the Radical Mastoid Operation (with Illustrative Cases)—HAROLD KISCH, F.R.C.S.—After the completion of the radical operation, a portion of the temporal muscle is separated partially from the main mass of the muscle. The fascia over the graft is divided, and some of the fibres cut across, until the graft can lie, without tension, in the cavity made at the operation. The meatus is then replaced, without any plastic operation. The skin incision is completely closed, and a plug placed in the meatus. The graft attaches itself to the bone, and no further attention is given to the mastoid. The meatus and middle-ear are cleansed daily with peroxide drops and weak perchloride of mercury solution.

The patients are able to return home about a week or ten days afterwards and there is only a minimum amount of discharge from the middle-ear. After-treatment is painless and hearing results are good.

Dr J. S. FRASER (President) asked what was the object of this temporal muscle graft. He himself liked to make as large a meatus as possible, to line the cavity with a skin-graft and get it dry, white and smooth. One could not always achieve such perfection but that was his aim. He did not see much point in filling the mastoid cavity with a piece of temporal muscle.

https://doi.org/10.1017/S0022215100032631 Published online by Cambridge University Press

Mr A. R. TWEEDIE said he understood this was a case which had been only recently operated on, but at present there appeared no tendency for an epithelial covering to form over the graft.

Dr NICOL RANKIN said that if successful the value of this method would lie in the time and number of dressings saved in the healing of the mastoid cavity. He would be glad to hear the reasons for doing it, and to see the cases at a later date.

Mr KISCH (in reply) said radical mastoid cases required much attention and dressing afterwards, and he thought that if the cavity were obliterated, the need for so great attention would be obviated. At first he used a portion of the rectus femoris muscle, splitting the meatus and then applying the graft. That was three years ago, and the cases did well. In only one instance did the muscle graft die, needing the reopening of the wound to remove it. Then it occurred to him it would be better to use a muscle which could be left attached by its base, and he chose the temporal muscle. In order to obtain this graft there was no necessity to enlarge the mastoid incision; it was easy to expose a large portion of the temporal muscle, and, by an incision through the muscle, to bring it down, so filling up the mastoid cavity.

The question had been raised as to whether the muscle remained alive when it had been used. He had had the opportunity of re-opening a case and examining the graft afterwards, and he had found the mastoid cavity filled with the muscle, which was active, and contracted on stimulation. There was no necessity for a plastic operation on the auditory meatus, and the after-treatment was quite painless, whereas after an ordinary splitting of the meatus there was always some discomfort attending the dressing. The attic region was the only part which had yet to heal, but the amount of discharge from that area was very slight, and healing proceeded well.

SCOTTISH SOCIETY OF OTOLOGY AND LARYNGOLOGY.

TWENTY-SEVENTH MEETING, EDINBURGH.

May 26, 1928.

President—Dr JAMES ADAM.

The Bacteriological Examination of the Tonsils in Special Cases: A Preliminary Communication — R. B. LUMSDEN, M.B.

The paper is published in the *Journal of Laryngology and Otology*, Vol. xliii., p. 724, October 1928.

DISCUSSION.

Dr LOGAN TURNER said that the Society was indebted to Dr Lumsden for bringing forward this subject. He had made it clear that it was a preliminary communication and he (the speaker) thought that Dr Lumsden

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