CEREBELLAR ABSCESS SUCCESSFULLY TREATED BY OPERATION.

WITH A NOTE ON A METHOD OF COUNTER-DRAINAGE EMPLOYED.

BY

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THE following case of successful issue to operative treatment of a cerebellar abscess is of interest on two grounds:

(a) While the dictum "cerebral abscesses (treated surgically) recover—cerebellar die" is obviously much too absolute, it may lay claim to a certain basis of truth. It is a well recognised fact that, in comparison with cases of abscess in the temporo-sphenoidal lobe (and other less common sites of cerebral abscess) successfully surgically treated, cases of cerebellar abscess resulting in recovery are rare. The cause of death in many of the cases would appear to be thrombosis of the veins of Galen with consequent dropsy of the ventricles and oedema of the brain. While this is frequently a more or less immediate result, there have been cases where the fatal result has followed after an interval of weeks or months of apparent recovery from the effects of the abscess.

For that reason the present case, published two and a half years after operation, is perhaps the more worthy of record.

(b) The markedly favourable effect produced by the employment of counter-drainage (*vide* the following description of the case):

T. B., aged 26, came to the out-patient department of the Glasgow Ear Hospital on May 17th, 1898. He had had purulent discharge and deafness in connection with the left ear for ten years. During the previous year the discharge had been more copious. In addition, he had for a month suffered from the following symptoms, all of which were present at the time of his applying for treatment: Pain in the ear, severe headache (general), giddiness, and distinct but not absolute facial paralysis.

On May 25th, a week later, he returned. All his symptoms were aggravated, and, in addition, he suffered from vomiting, and tenderness on pressure over the mastoid and upper part of posterior triangle of neck. His temperature was 97.6°, and his pulse 56. His breath was foul, and he was distinctly apathetic and drowsy. He was seen by Dr. Barr, and at once admitted for operation.

The following day Dr. Barr opened the mastoid cavity. The knee of the lateral sinus lay unusually far forward, and was exposed by the burr. It appeared healthy. The antrum, of small size, was found high up, situated in very dense sclerosed bone, and filled with pus and granulations. It and the middle ear were cleared out and packed with iodoform. After the operation he lay for a lengthy period drowsy, and subsequently passed a very restless night. During the two following days he became still more apathetic and dull, though, when shaken up, his headache and sickness appeared quite as troublesome. Nystagmus was noted, and the left pupil was found to vary, being at times, though not constantly, larger than the right, and sluggish in reaction. He yawned repeatedly. Dr. Ernest Thomson, who at this time examined the eyes, reported slight optic neuritis in the left eye, and a suspicion of optic neuritis in the right.

On May 29th, three days after the mastoid operation, Dr. Nicoll saw the patient with Dr. Barr. At that time he was nearly, but not completely, comatose. The left pupil was dilated (nearly twice the size of the right), and very sluggish to light. The facial paralysis was very evident. The temperature was 97.6°, and the pulse 56. While, therefore, the patient presented most of the general symptoms of lesion (presumably abscess) in the encephalon, there were present no clearly localising signs of that lesion. Later in the day Dr. Nicoll operated. In the absence of definite localising evidence, the already free mastoid aperture made by Dr. Barr three days previously was still further enlarged. This was done chiefly backwards around the sinus, and upwards towards the floor of the middle fossa. Everywhere the bone presented the white denseness of old sclerosis. Nowhere could any "lead" be discovered in the form of a track of pus, granulations, or necrosis traversing the bone.

The temporo-sphenoidal fossa was then opened in the usual situation (Fig. 1-1). The dura bulged somewhat, and, on incising this, the cerebellar cortex bulged in the aperture. The temporo-sphenoidal lobe was explored with the cannula in various directions to the depth of 1 to 2 inches, with negative result.

The cerebellar fossa was then opened at the spot indicated (Fig. 1-2). On removing the bone the dura at once bulged white in the aperture, evidently under considerable pressure, and on incising this the cerebellar cortex also presented the bulging and pallor characteristic of pressure. The exploring cannula, on being inserted into the cerebellum, tapped an abscess cavity at a depth of about half an inch from the cortex. From the abscess there drained a quantity of excessively fetid pus, the quantity being variously estimated at from $\frac{1}{2}$ ounce to 1 ounce. Cover-glass preparations and cultures failed to yield demonstration of the presence of micro-organisms. A rubber drainage tube was placed in the abscess cavity, extending 2 inches from the scalp, where it was secured by suture. Within a few days marked improvement had taken place, all the patient's symptoms becoming less pronounced. At each dressing the abscess cavity was gently douched with weak carbolic acid.

Fig. 1.—Photograph of interior of a skull, on which are indicated the positions of the apertures made in T. B.'s case.

At the end of six weeks the patient was practically in every way well, except that at each dressing there escaped both from the drainage tube and the middle ear a certain quantity of slightly fetid pus. On July 9th therefore, Dr. Nicoll again operated, making an aperture into the cere-

Fig. 2.—Photograph of patient showing the two drainage channels made into the cerebellar abscess cavity. 1 and 2, arrow-headed probes placed in the channels (*vide* text).

bellar fossa through the posterior aspect of the petrous bone (Fig. 1-3). This passage opened externally into the mastoid cavity made by Dr. Barr, just in front of the knee of the sigmoid sinus. Internally, as the illustration indicates, it entered the cerebellar fossa through the triangular area of the posterior aspect of the petrous bone, bounded by the sigmoid sinus behind and below, the internal auditory meatus (with the auditory and facial nerves) in front, and the tentorium cerebelli (and superior petrosal sinus) above. At this point, at the inner end of the passage cut in the bone, the dura was incised and an aperture made through the cerebellar cortex into the abscess cavity.

Through this channel the abscess was drained as well as by the pre-existing drainage route in its posterior aspect established at the former operation. The result of this second opening was a marked diminution in the amount of the discharge. At each dressing the abscess cavity was gently douched through, the weak carbolic lotion being always injected by the posterior aperture. At the end of five weeks the discharge had all but ceased from the abscess, though it continued from the middle ear.

Fig. 2 represents the condition of parts at this date. In each of the two apertures is placed an arrow-headed probe, the points meeting in the abscess cavity. Probe No. 1 lies in the anterior drainage channel, steadied by the lightest touch of the nurse's finger. (To define it in the photograph the end was covered with black varnish, part of which has become smeared on the helix.) Probe No. 2 lies in the posterior drainage channel, the external end of the drainage tube, with its restraining scalp suture, being shown. The arrow-head of this probe is indefinite, and badly defined in the photograph. This is owing to the constant movement resulting from the cerebellar pulsation. It was found impossible to steady both probes by the finger without hiding too large a portion of the patient's head. The distance between the two apertures is $\frac{1}{2}$ inch, which, however, in the photograph is not apparent, owing to the "foreshortening" produced by the patient's head having been turned too far forward. The large mastoid operation cavity has become largely filled up by granulation tissue. Running upwards from the mastoid cavity, over the squamous bone, is the

scalp scar of the incision made for exploration of the temporo-sphenoidal lobe. This scar pulsates owing to the deficiency of the cranium beneath it at the point where the bone was removed over the middle fossa.

At this date, five weeks after the second drainage operation, drainage was discontinued through the anterior channel, which within the following two weeks ceased to open into the abscess cavity. The scalp suture was also removed from the posterior tube, which was subsequently shortened slightly from time to time as the contraction and filling up of the cavity gradually expelled it.

During the following weeks, though the patient was in every way well in general health and the tube practically free from discharge, it was not entirely withdrawn, as the middle ear constantly contained small quantities of pus, which apparently escaped from the internal ear. It was not, therefore, considered advisable to allow the abscess drainage channel to close.

On September 23rd a bony sequestrum was discharged from the internal into the middle ear, and removed by forceps through the mastoid cavity. The sequestrum was of irregular shape and of the size of a large pea (one-third inch by one-quarter inch). The tube was at this date withdrawn, and the posterior wound permitted to close, which it did in a few days.

Fig. 3.—Photograph of patient four months after drainage of the cerebellar abscess. At this date the facial paralysis, which had been present for four and a-half months, had disappeared.

Fig. 3 represents the patient at this stage. The facial paralysis had quite disappeared. He walked without giddiness, read and wrote, and had not a symptom of his former trouble, except that there still existed some slight discharge from his middle (internal?) ear. This Dr. Barr treated.

On November 4th, 1898, the patient was shown to the Glasgow Medico-Chirurgical Society. At that date he had returned to his occupation, having no trace of his late illness except that that his old deafness remained, though the ear discharge had ceased.

Instances of recovery from cerebellar abscess are not of frequent occurrence. In 1896 Dr. Acland and Mr. Ballance published in the *St. Thomas's Hospital Reports* a paper on cerebellar abscess containing a full account of the literature of the subject up to that date. They state (1) that every case of cerebellar abscess not operated on has proved fatal; (2) that, up to the date of the paper, there had been published

10 (possibly 11) cases of recovery after operation, and 16 cases of death after operation. "These numbers," however, the authors remark, "do not accurately represent the percentage of success after operation, since it is within our knowledge that many fatal cases have not been published."

Experience of such cases goes to prove that: (1) Early operative interference in the way of discovering and subsequently draining the cavity offers the only chance of recovery in cases of intracranial pyogenic lesions; (2) that the results in such cases of operative interference have been much more favourable in temporo-sphenoidal than in cerebellar abscess; (3) that the cause of death in cerebellar abscess is, in a large majority of the cases, dropsical distension of the lateral ventricles (with oedema of the surrounding brain tissue). This ventricular dropsy appears to be the result of obstruction of the veins of Galen, produced by thrombosis originating in their lumina, or extending thence either from the superior cerebellar veins or from the straight sinus.

At the present date, two years and a half after operation, the patient remains well. For twenty-six months he has followed his occupation, without the slightest return of any of his symptoms. He is still, however, deaf in the affected ear, and pulsation can be detected in the trephine area over the temporo-sphenoidal lobe.

TREPHINING IN INTRACRANIAL SUPPURATION THE RESULT OF FRACTURE.

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The following report refers to a case of intracranial abscess resulting from a fracture of the frontal bone caused by a blow with an iron bar.

History.—A soldier, aged 24, suffering from a lacerated wound in the forehead, walked into a military hospital some eleven hours after the infliction of the injury. Although carefully looked for by the military surgeon when the patient presented himself for treatment, no fracture could be discovered; the wound was, however, antiseptically dressed, and the man was detained in hospital. An attempt to obtain union by first intention failed, and although the part was carefully attended to each day, pus persisted in flowing from the wound. On the eighteenth day after the injury the patient was seized with an epileptiform fit that lasted for an hour and a half, at the end of which time full consciousness returned. While suffering from this attack there was right ptosis, which, however, soon passed off.

Condition when First Seen.—Some hours after the seizure, when I first saw the patient, his pulse was 64, and his temperature 101°. His face was not flushed, his pupils were equal in size, and there was no paralysis. He was quite conscious, and said he had no pain in his head. The wound at this time was carefully syringed with carbolic lotion, fresh dressings were applied, and a dose of calomel given, which acted well. A good night was passed, and next forenoon the temperature and pulse-rate were as on the previous day. The patient presented a normal appearance, and said he had no complaint to make. On the third day after the epileptiform attack I found the patient perfectly conscious, but learned that he had had another severe seizure that morning. The left hand grip was now weaker than normal, and the right pupil was dilated. The temperature was 101°, and the pulse 64°.

Operation.—A diagnosis of an intracranial abscess was now made, and I recommended trephining over the seat of the injury. Colonel Martin, R.A.M.C., agreeing to this course, and chloroform having been administered, I enlarged the wound in the forehead, and on exposing the frontal bone, already denuded of pericranium over a considerable area, I discovered an oval fracture on the right side, about two inches above the orbital margin. The long diameter of the fracture measured a little over 1 inch, while the short diameter was about half that length. The fracture proved to be of the outer table only; but a linear fracture of the inner table, corresponding to the long diameter of that of the outer table, was subsequently discovered. There was no displacement on either side of the bone. On removing the bony disc, about two drachms of thick creamy pus immediately escaped. The pus seemed to have collected between the bone and the dura mater, the latter having a dark, unhealthy appearance. As, however, the pulsations of the brain were quite visible, I refrained from opening the dura mater. Warm carbolic lotion was freely used to cleanse the wound and the exposed membrane. The parts were then dusted with iodoform, and the lips of the wound loosely brought together by a few silk sutures. The patient quickly regained consciousness after the dressings were applied.

Progress.—On the day after this operation the patient said he felt well, having had a good night. The pupils were normal, and the left hand had recovered its power. On examining the wound on the following day a considerable quantity of pus was found to have exuded. The part was syringed with a 2 per cent. solution of carbolic acid, and then dusted with a mixed powder containing boric acid and iodoform. On the third day after the operation the temperature was 99.5°, and the pulse 76. Pus was still being discharged from the wound, which was cleansed as before with carbolic lotion, pure iodoform being used as a dusting powder. The patient seemed weak and drowsy on the fourth day. He was perspiring about the face, and complained of his head being painful. All noises, and even ordinary sounds, seemed to irritate him. A considerable