

be recognized, and progress in the future is likely to depend much more upon the discoveries which shall make surgery less necessary than to open new fields for surgical treatment. Fully recognizing the marvelous benefits to humanity which anesthesia and asepsis have brought about, it must be admitted also that these benefits are not wholly unalloyed. Operations are undertaken which are followed by the immediate death of the patient; others prove to be wholly unnecessary; and still others leave the patient in a condition of helpless invalidism, often making life worse than death. Any operation which does not better the condition of the patient must be regarded as a therapeutic error, since the knowledge thus obtained shows that the operation should not have been performed.

The advance of knowledge in the future should be in the direction of limiting these unnecessary and harmful operations; for the wisdom of the surgeon should serve as well to restrain him from operating as to enable him to operate successfully. Especially to be cultivated for these purposes are greater accuracy in diagnosis and prognosis, and a more widely spread knowledge of pathology and pathological anatomy. The surgeon thus will become a better adviser, although the number and variety of his operations thereby may materially be lessened.

Original Articles.

SUCCESSFUL OPERATION UPON A CASE OF BRAIN ABSCESS FOLLOWING SUPPURATIVE MIDDLE EAR DISEASE.¹

BY FREDERICK L. JACK, M.D., BOSTON,

Aural Surgeon to Massachusetts Charitable Eye and Ear Infirmary.

Prior to the appearance of Macewen's² treatise, the subject of suppurative infection of the meninges and brain, resulting from disease of the middle ear, had not received the systematic attention it deserved, though many cases had been reported, and the subject of brain abscess had been by no means neglected in the literature. This is not surprising in view of the universally hopeless prognosis of these conditions, both with and without operation.

A new impetus to the study and a fresh incentive to operation were aroused in 1893 by the work of this author, whose elaborate presentation of the subject from the pathological, symptomological and operative point of view, placed it for the first time on its proper plane, whether regarded from the scientific or from the purely practical standpoint.

The increasing interest in this subject as well as the improvement in prognosis appears from the statistics gathered by various writers. Up to

1889 von Bergmann³ found only 8 successful operations on brain abscess of otitic origin; up to 1894 Körner⁴ had collected only 55 cases of operation both successful and unsuccessful; in the following year he had increased this number to 92. In 1898 Marsch found reports of 60 successful operations upon temporal and 12 upon cerebellar abscess.

The prominent symptoms of brain abscess are headache and vomiting, with normal or subnormal temperature in uncomplicated cases, slow pulse, progressive mental deterioration, mental dulness passing into apathy and eventually into coma, preceded or accompanied by convulsion. Pupillary changes, ocular paralysis and optic neuritis may appear, the latter less frequently than in tumor. Hemiplegia sometimes completes the picture, and generally denotes extension from the temporal lobe inwards upon the internal capsule.

The usual seat of abscess is in the temporo-sphenoidal lobe over the tegmen tympani, and in this direction the exploratory operation proceeds unless definite symptoms of cerebellar disturbance point to invasion of that organ. Such symptoms following ear disease demand prompt surgical interference. It is true that in rare instances a small abscess may be absorbed, or a large one near the surface may discharge spontaneously, but this chance is too remote to justify expectant treatment.

The case which forms the basis of this communication is sufficiently important to place on record as showing the possibilities of operation even upon a moribund patient. It further shows that trephining over the squamous portion of the temporal bone is not always necessary for the evacuation and complete discharge of the abscess and removal of all symptoms. This point is of practical interest in view of the following conclusion of Macewen⁵ with regard to the operation through the tegmen tympani. "Such an opening into the cerebrum suffices for temporary purposes, but though it always ought to be made in order to eradicate the source of the infection, it is not safe to trust to it alone, as in many cerebral abscesses there are sloughs of brain tissue which cannot be easily removed in this way, but require a larger opening in the skull for their evacuation."

From the symptomological point of view it is hoped that the detailed examination of the speech defect in this case will be of interest, since Macewen states that careful reports are lacking of the variety of aphasia accompanying this disease, though its occurrence has been noted.

J. W., newspaper reporter, married, 25 years old, of Boston, presented himself at the clinic of the Massachusetts Charitable Eye and Ear Infirmary July 31, 1901.

History.—The left ear had troubled him for 3 years. There was a discharge last winter which ceased up to 6 months ago, when it reappeared. During the last 6 weeks he suffered with frontal

¹ Read before the Boston Society for Medical Improvement Dec. 2, 1901.

² Pyogenic Infective Diseases of the Brain and Spinal Cord, by William Macewen, M.D., Glasgow. New York: Macmillan & Co., 1893.

³ Die Chir. Behand. v. Hirnkrank.

⁴ Cited by Miller, Deutsch. Med. Woch., 1897, vol. xxiii, S. 842.

⁵ Deutsch. Med. Woch., 1897, vol. xxiii, S. 333.

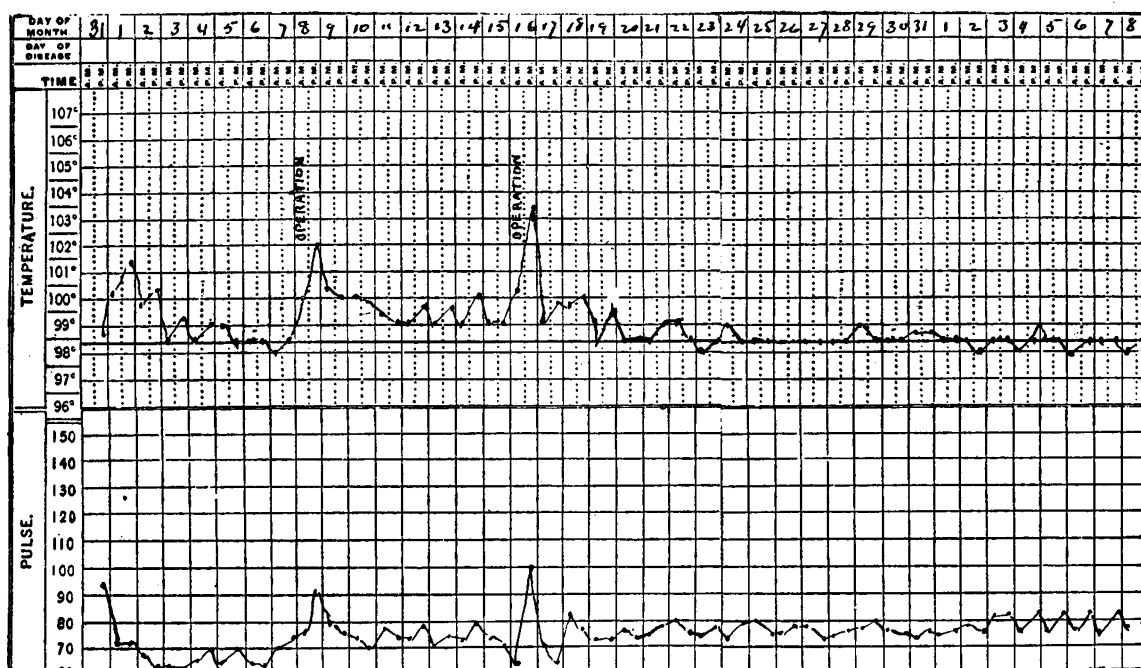
headache, but there was no pain in the ear until 2 days before admission to the Infirmary, when he awoke from a sound sleep with a severe headache.

Examination showed a small amount of pus in the auditory canal. The walls of the canal were slightly swollen, but not especially tender to pressure. Landmarks of the drum membrane were obscured by swelling. The posterior segment of the drum was red and bulging. The mastoid was tender to touch over the tip and antrum, but not swollen.

The hearing tests were as follows: Watch not heard; the hearing for the voice was reduced about one-half. The tuning-fork by air conduction was only heard one-twelfth of the normal time (T. F. 512 V. S. A. C.=20 "heard 1"). Bone conduction was normal (B. C.=10 "heard 10"). Tuning-fork applied to the skull was heard

through sclerosed bone the entire distance. The antrum was found filled with pus. On enlarging the opening above, and posteriorly, softened bone with granulations and purulent matter were found. With chisel and curette the bone was removed from the middle fossa for over a distance of 1 inch in length, and a half-inch in breadth. The lateral sinus was also exposed about an inch. This was necessary in order to thoroughly remove all diseased parts.

The dura was normal in color and without bulging. The wall of the sinus showed nothing abnormal. The neck of the antrum was enlarged and the middle ear carefully curetted, removing the incus together with masses of cholesteotom. The wound was irrigated with a bichloride solution (1 to 3,000) and sterile water and dressed in the usual way.



louder in the affected ear (Weber F. 256 V. S. louder in the left ear). The test by Galton's whistle was normal. The low tuning-fork was not heard (V. S. 192).

Severe headache appeared in a few days. The mastoid tenderness, however, gradually disappeared and also the swelling in the canal. The temperature fell from 101° F. on August 1 and remained at 99° F. for several days. The pulse during this time varied between 60 and 70. On August 7, seven days after opening (paracentesis) the drum, the patient had a chill and complained of intense frontal headache. The temperature quickly rose to 102° F., pulse 90. There was no tenderness over the mastoid. Operation was advised and accepted.

Extradural operation.— Under ether the usual mastoid incision was made and the periosteum was divided. A deep opening was necessary

Bacteriological report.— Mixed infection.

For a few days after the operation the patient's symptoms improved. The temperature on the following morning was 100° F., the pulse 80. The wound was dressed daily and looked well. He complained, however, of severe headache (frontal). The ice bag and repeated doses of codeia afforded some relief.

August 16, at 4 A.M., on the eighth night after the operation, the patient was found pulling and pushing the bedclothes and could not be roused. The pupils were equal and contracted, but reacted to light. Temperature 98° F., pulse 102, thin and wiry. Convulsions soon appeared in the hands and arms. The temperature suddenly rose to 103° F., and the pulse fell to about 60. The patient was perfectly quiet and deeply comatose for 4 hours before operating. Perspiration was profuse, and the urine was passed involuntarily.

Intradural operation.—The wound was reopened and enlarged by an incision upwards over the squamous bone and posteriorly for about 2 inches towards the occipital protuberance. The skin and periosteum were retracted so that the skull above the mastoid was fully exposed. With chisel and rongeur forceps bone was removed so that a larger surface of the middle cranial fossa was exposed than at the previous operation.

There was bulging outwards of the dura most marked over the tegmen tympani. No opening could be found in the dura. A hypodermic needle was passed twice upwards into the brain before pus was drawn into the syringe. A narrow knife was then entered at a point over the tegmen and passed upwards about 1 inch into the brain following the direction taken by the needle. The opening was enlarged by forceps and over 4 oz. of foul pus and sloughing brain tissue were evacuated.

The abscess cavity was thoroughly irrigated with a solution of carbolic acid (1 to 40), then one of bichloride (1 to 3000). After all necrotic material had been removed the dural wound was wicked with a small piece of iodoform gauze. The wound over the skull was partially closed by sutures, and the cavity of the mastoid covered with thin rubber sheeting packed with plain gauze and dressed.

August 17.—The temperature rapidly fell to 99° F. in 12 hours, and the pulse ranged between 60 and 70. The patient was quiet during the night and seemed rational at times. Answered when asked if he had any pain. The wound was dressed, and upon removing the wick about one-half ounce of fetid pus discharged from the abscess cavity in the brain. The cavity was washed out and dressed.

August 18.—The patient recognized his attendants this morning. Temperature 100° F, pulse 75. The wound was dressed daily, and every possible care taken of his general condition.

August 22.—During four days the patient had complained of headache (frontal). The temperature varied slightly between 98° and 99° F., pulse good. He had been less rational, and at times was roused with difficulty. The discharge of pus from the abscess cavity was becoming less in amount, and the brain was found somewhat bulging into the mastoid wound.

Examination of the eyes.—Pupils react normally to light. No hemianopsia. With homatropine the fundus of the right eye showed a slight swelling of the disc and tortuosity of veins, the left eye marked swelling of disc and tortuosity of veins. There was paralysis of left abducens muscle (eye would not rotate outwards beyond the median line). The patient stated, however, that the left eye had always turned inwards. The movements of the right eye were normal. He showed signs of aphasia. When shown an object he was unable to name it, although he repeated the name when told. He also recognized a relative whom he had not seen for 4 or 5 weeks, but could not call her by name.

August 23.—Symptoms of imperfect drainage appearing, blunt scissors were inserted into the cavity of the abscess, and upon enlarging the opening there was a discharge of about 2 oz. of very foul pus. The cavity was irrigated and a rubber drainage tube was inserted in place of gauze. The aphasia continued the same.

Recovery was uninterrupted from this time, and the patient was discharged practically well Sept. 12.

Remarks.—Should the brain have been explored for the abscess at the time of operating upon the mastoid? Against such a step were absence of bulging of the dura or congestion and no visible erosion of the dura after careful inspection, especially over the area of the tegmen tympani. It is true that Wallace⁶ reports a similar case in which an abscess involving the greater part of the tempero-sphenoidal lobe failed to produce bulging of dura into the opening made by operation. It is perhaps, therefore, unsafe to regard this failure as an absolute contra-indication.

Up to the time of the operation all of the symptoms could be accounted for by the condition found, and it did not seem advisable to injure brain tissue. The abscess, however, undoubtedly existed at that time and was the cause of the headache.

This question was discussed at a recent meeting of the *Société Française d'Otologie de Rhinologie et de Laryngologie* in 1897.⁷ The prevailing opinion seemed in favor of delaying for a day or two after operating upon the extradural abscess. The suggestion was made, however, that the danger of infection through continuing the first operation into the brain might be obviated by applying the thermocautery to the spot through which the puncture was made.

The opinion of Macewen regarding the necessity of opening the squamous portion as well as opening through the tegmen tympani seems to be very generally shared. Review of available literature shows that the practice of trephining (or of opening by the chisel) over the ear is practically, perhaps quite, universal, and it would be presumptuous to assume from this one case that the prevailing opinion was erroneous. That such an opening is not invariably necessary is certainly demonstrated.

A certain advantage is gained by avoiding the external opening, in that the danger of hernia is reduced to the minimum, though this consideration should not deter the operator if any question exists as to the complete evacuation of the contents of the abscess.

The opening through the tegmen sufficed not only for the removal of a large amount of pus, but also of considerable sloughing brain tissue. That the evacuation and drainage were complete is shown by the perfect recovery.

⁶ Translation Medical Chirurgical Society, Edinburgh, 1895, xv, 96.

⁷ Ann. de mal. de l'oreille et du larynx, Paris, 1897, p. 640.