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ENDOCRANIAL COMPLICATIONS OF OTIC ORIGIN.

TWO CASES OF CEREBRAL ABSCESS.*

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Since otology has become more surgical we have from time to time the opportunity of observing ear complications developing in the cranial cavity. As this part of pathology still requires clearing up, we think it is the duty of all surgeons to report the facts they have the opportunity of observing, so as to collect the material wherewith to build up a solid edifice of knowledge on a series of observations. In this way we will be able to elucidate various cerebral complications originating from the ear. At the present moment we must confess they present numerous difficulties of diagnosis.

Indeed, except in the cases where lesions are situated in parts of the brain which react externally (motor or other centers), the symptoms are often so vague and so various—sometimes even so slight—that it is impossible for the clinician to make a positive diagnosis, and, above all, to settle the moment for surgical interference. In certain cases, indeed, particularly in extra-dural abscesses, we doubtless look on at large collections of pus forming round the brain without the patient experiencing any symptoms other than a slight malaise or intermittent headache, sometimes a little torpor following

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on compression. But these different signs are far from being sufficient for warranting interference by the surgeon if he was not impelled by other circumstances, such as a chronic otorrhea or a fistulous tract, which led him during the operation to the extra-dural region.

In another series of cases the patient manifests a certain number of symptoms which indicate that the encephalon is affected in some part. When, at the operation, starting from the ear trouble, we arrive at the dura mater, and find at this level a collection of pus, it is customary to there limit our interference, being convinced that what we have found is sufficient to explain the symptoms exhibited by the patient before the operation. Very often, then, after the opening of this extra-dural abscess, the operator sees that the cerebral phenomena continue or even become worse; his intervention has not been sufficient, and it is not always advisable for him to resume it, especially when he has to do with private patients. However, if we have no distinct signs of localization, is it logical to deliberately open the meninges and puncture the brain, thus exposing the patient to an infection which did not exist beforehand—particularly when we have found a considerable extra-dural lesion in connection with the aural lesion? For if the symptoms continue after an operation of this kind it might be asked, unless one finds pus from the cerebral puncture, if the complications existed beforehand or if they had not been the sequence of a surgical infection? The following case is interesting from this point of view. The first operation only relieved the patient for a short time, then the phenomena continued to be more marked, and even more limited, showing that one had to do undoubtedly with an encephalitic lesion. The family refused a second operation.

Case I. Reported by Dr. A. Brindel (First Assistant in the Otological Clinic at Bordeaux). Cerebral Abscess Consecutive on a Chronic Otorrhea, Complicated with Influenza. Stacke's Operation. Extra-Dural Abscess. Very Marked Improvement. Five Days Afterwards Fresh Cerebral Symptoms, Causing Death in Forty-eight Hours. Refusal by the Family of a Second Operation.—M. M., age fifty, has an old-standing suppuration in the left ear. Influenza one month previously. For twelve or fourteen days acute, sharp pain in the mastoid region. Cerebral symptoms for four days—delirium, fever without remission up to 40°C, and intense headache on the side affected. For two days the patient is half comatose, with profuse perspirations. Pressure on the mastoid at the level of the antrum is very painful. Unilateral facial paralysis on the side affected.

Patient was seen for the first time on November 5th. Operation was decided upon at once, but could not be performed before November 7th.

Operation, November 7, 1898.—Incision in the retro-auricular furrow, petro-squamosal suture very marked. The bony meatus was enlarged in its superior half by means of the gouge and mallet. The first layers of tissue did not appear hard, but considerable hardness in the apophysis. With one blow of the gouge the external surface of the lateral sinus was exposed. It was not more than one centimeter and a half distant from the back of the meatus. In one of the mastoid cells on the inferior walls of the mastoid opening pus was found. The antrum was thoroughly exposed. It was small, placed high up, and it, as well as the tympanum and the tympano-mastoid canal, was full of caseous and fungating material. *The roof of the antrum and of the tympanum no longer exist.* The bony wall was destroyed to a considerable extent. *Pus and fungating material were found on the meninges.* After curetting, they appeared to be still resistant, and the operation was not carried further. Careful curetting of the large cavity formed by the antrum, the epiphysis, the tympanum and the tympano-mastoid canal. The membranous meatus was slit in its whole length at its center. The inferior flap thus formed was fixed by a cat-gut suture. The upper flap was entirely removed, the retro-auricular wound was immediately closed and the meatus plugged with iodoform gauze.

November 7th, Evening.—Intelligence commenced to return. Temperature 38°C.

November 7th-10th.—Intelligence returned; no fever.

November 10th.—The patient begins to take an interest in his own condition. No headache. Facial paralysis continues. General condition good. Dressing renewed. No pus.

November 11th.—Patient feels well. Got up and commenced to eat with appetite.

November 12th.—Suddenly during the night of the 11th to the 12th the delirium appeared again and also the coma. Patient frequently carried his left hand to his head over the dressing. He does not answer any question. In the evening he is still comatose; respiration 31, pulse 100, temperature 39.2°. *The right arm is distinctly and strongly paralytic. Incontinence of urine.* Wound dressed. No pus. Respiration stertorous.

November 13th, 1 p. m.—Same condition. Right arm completely paralyzed. Uneasy respirations, 51. Pulse 147. Coma. The pupils react a little to light. Patient evidently suffers from his head.

A second operation was proposed, which would have consisted of craniectomy at the level of the temporal lobe and one or more exploratory punctures of the brain, for we thought that we had to do with all the symptoms of a cerebral abscess.

The family, though very intelligent, refused the second operation, although warned even before the first operation that it might be necessary.

The patient died on November 14, 1898. No post-mortem.

I might compare with this case another which I have already published in which the extra-dural lesion (an abscess) was emptied, but improvement did not follow, and I did not have the opportunity of operating a second time, as the patient died after forty-eight hours from an enormous abscess in the brain, which I discovered at the post-mortem.

The duty of a surgeon in cases of intra-cranial complications (phlebitis excepted) may, however, be sometimes very difficult to determine. Indeed, as I have already remarked, when an affection of this character is suspected and an operation performed one has to settle whether in the absence of all symptoms of localized cerebral trouble, and *sometimes even when they are present*, one has to settle, I repeat, whether the existence of an extra-dural collection or of a meningeal origin easily diagnosed ought to stay the surgeon's hand, or if, on the contrary, he ought, in spite of the existence of these extra-dural lesions, to push his operation still further. It seems logical to admit that, as a rule, it is the second hypothesis that a wise surgeon ought to adopt, being prepared to continue his operation twenty-four or forty-eight hours afterwards if the symptoms do not amend as they should do if only a single lesion existed.

It appears to me that our rule of action ought to be the same both in hospital and private practice, and if in the latter the patient's friends raise difficulties to a second operation, the surgeon clears his responsibility and his conscience by acting as I have indicated.

On the other hand, if the lesions found external to the dura mater are not sufficient to explain the symptoms, one must not hesitate to proceed at once to the brain to detect the cause. Sometimes this will be discoverable, but in other cases, on the contrary, in spite of the radical intervention, the symptoms will continue and end in death. It is particularly in the cases of abscess of the brain, abscess without limiting walls, that the treatment becomes difficult of application and that the opening of the purulent collection is not sufficient to effect a cure. It is a case of this character which I am now able to report. The case is interesting from several points of view. First of all

because of the symptoms which enabled us to make a clear diagnosis of cerebral abscess, and, secondly, because of the unaccustomed development which took place during the operation.

Observation II. Reported by Dr. A. Brindel (Chief Assistant in the Otological Clinic at Bordeaux). Abscess of the Brain Consequent on Acute Suppurative Otitis Media with Mastoiditis. Stacke's Operation. Puncture of the Brain. Spontaneous Evacuation of the Abscess into the Wound Ten Days after Operation. Temporary Improvement. Death on the 22d Day by Hemorrhage into the Site of the Abscess with Flooding of the Ventricle. Autopsy.

January 2, 1899.—G. L., age thirty-six, grocer, contracted a cold seventeen days previously. Took to bed with fever. Next day complained of a violent pain in the head and in the left ear. Two days afterwards discharge from the ear and relief of the earache. (Consequently this occurred fifteen days previously.)

On the sixth or seventh day after the commencement of the disease fresh earache and intense headache which have not left the patient. From this period (December 22, 1898) insomnia and loss of appetite. On December 31, 1898, commencement of intellectual phenomena; confusion of ideas; vertigo.

On the left side suppuration; small perforation in the center of the membrane; pain on pressure on the left apophysis, which is slightly raised *en masse*. No pain on percussing the cranium.

Hebetude; debility; loss of appetite; slight compression. Intense frontal headache; slight vertigo; no vomiting. Pulse 80. No convulsion. Temperature normal, 37°C.

Homonomous Hemianopsia right. Pupils equal; the pupil reacts less feebly. The papilla seems congested, and generally seems rosy. Visual field retracted. Reflexes normal; sensibility normal.

Examination by Professor Pitres.—Intellectual phenomena: word blindness; aphasia; word amnesia. On showing the patient a match box he could neither pronounce its name nor say what purpose it served. He could not name a key nor a pen, but said "It is for shutting," or "It is for writing." He recognizes a watch and knows the hour. He cannot read any writing.

He recognizes the figures 0, 8, 5. He recognizes the letter S, but not the letters T, I, M, Q, F. He recognizes the letters G, I, L, letters which go to form his name, but does not recognize his name Gilis, though formed by the letters which he had recognized separately. He succeeds, however, in reading his own name when it is formed with the same identical letters.

His repetition of words is perfect.

He writes from dictation. One gives him the word Bordeaux and then Paris. After having written the first four letters of each of these nouns he stops and it appears impossible for him to continue although we dictate the letters to him. He writes figures and the numbers 8, 25, 1899.

Spontaneous Writing.—The patient writes his own name without hesitation, but on two occasions when he wished to write Bordeaux he stopped at the fourth letter.

Writing from Copy.—When one writes out the word Bordeaux he copies it correctly.

Examination of Urine.—1033. Slight trace of albumen. Urea 27.50. Glucose 28.45, acid, phosphoric, biliary pigments.

Diagnosis.—Cerebral abscess situated at the level of the curved convolution (*pli courbe*). (Such was the diagnosis of Professor Pitres.)

The apophysis was, as remarked, slightly raised *en masse* and tender to pressure. There was a small perforation in the center of the membrane.

Operation, January 4, 1899.—Retro-auricular incision. Enlargement of the bony canal in its superior half with gouge and mallet. On the way some small cells were discovered. The bone was congested *en masse*; slightly hard; the mastoid is cellular. The antrum is put in communication with the tympanic cavity and the meatus (operation of Stacke). The roof of the antrum is necrosed; a small sequestrum separates the cavity from the encephalon. At two and one-half centimeters above and a little behind the antral opening but continuous with it, in the temporal bone, an opening is made exposing the meningeal surface in an area of about three centimeters in diameter. A crucial incision was made into the dura mater, the pia mater was incised. The point of a bistoury about three c.m. is plunged backward and a little upward into the cerebral substance, in the direction of the occipital lobe. This puncture is immediately followed by a considerable jet of venous blood as though one had made a large opening into a sinus. The blood is arrested by compression with sterilized gauze, but as it recurred at once on removing the compression we were obliged to discontinue the operation, and not to make new punctures either into the temporal lobe or into the sphenoidal lobe as we had intended. The cerebral wound was plugged, and a strip of iodoform gauze was packed into the atticomastoid cavity.

January 9, 1899.—Since the operation general condition is good, no complaint. Patient reads with pleasure, but he remains somewhat paraphasic. He does not recognize a clock.

The general sensibility is almost abolished on the right side of the body—*i. e.*, on the side opposed to the lesion. The testicular reflex does not exist on the right side. The right arm is distinctly paretic; the plug was removed. No bleeding; pulsation of the brain normal. The skin is sutured, but a small piece of iodoform gauze was left in the brain.

January 10, 1899.—Same condition except that the sensibility has returned to the right side.

January 13, 1899.—General condition good. No fever. Good appetite. Tongue dirty, but moist. The urine was again analyzed; no sugar, trace of albumen. Sp. gr., 1021.

January 15th.—The dressing was found inundated with pus which had flowed even as far as the shoulders of the patient during the night between the 14th and the 15th. The wound was healthy, the pus distinctly coming from the brain in the upper part of the incision (temporal lobe). More marked hemianopsia. The site of the cerebral abscess which had emptied itself is drained by means of a rubber drainage tube.

Since the operation the temperature has never reached 37°C.; on the morning of January 11th it was 35.2°C.

January 15th to 24th.—Patient manifestly better. Is always paraphasic, but he speaks and interests himself in everything. Knows his name; counts up to twenty; eats and gets stronger. He is dressed every other day.

January 24th.—Patient commences to complain of his dressing pressing his head. He becomes sad and depressed.

January 25th.—Dressing renewed. Large cerebral hernia. Patient bad color; tongue dirty. Answers questions; counts up to nineteen; paraphasia increased.

January 26th.—Same condition in the morning. Seven o'clock in the evening he becomes comatose and dies at 10 o'clock. This day the temperature got up to 38°C.

Post-mortem on January 27th.—There was found at the level of the curved convolution (*pli courbe*) a large collection of necrosing encephalitis (diffused abscess) in the interior of which was found a large black blood clot which extended as far as the interior of the ventricle. Above the fissure of Sylvius, and at a point corresponding to the cavity of the abscess; very superficial at this point, the pia mater is necrosed in a small situation and gives passage to pus. The temporo-sphenoidal lobes formed the hernia in the cranial wound and were affected with diffuse encephalitis.

In brief, the patient died of hemorrhage into the site of a cerebral abscess, with flooding of the ventricle.

In this case, in spite of the compression of the brain by a plug of iodoform gauze introduced into its interior, the symptoms of compression were very slightly marked the patient would probably have been cured once his abscess was opened if we had had to do with a veritable encysted abscess, instead of a collection of diffuse purulent material. As usually it is impossible to say when a cerebral abscess is opened if one has to do with an encysted abscess or with an abscess situated in the cerebral mass, without limiting membrane, we should observe certain rules dictated by prudence. One is, in my opinion, that one ought never to make injections into the interior of the cerebral cavity, for in my case particularly an injection would not have failed to have produced what was done later on by the purulent collection itself—*i. e.*, to penetrate the ventricles and bring about sudden death.

Perhaps it might be possible to recognize the abscesses which have a limiting wall on examining the pus which escapes by the orifice of the drainage tube or the cannula placed in the brain. In my case, indeed, it was absolutely evident that the pus was mixed with sphacelated cerebral material, which made me fear from the very beginning a fatal issue in spite of the opening of the abscess.

From another point it is interesting to note the considerable cerebral hernias which are not revealed by any distinct trouble. Indeed one meets with a fair number of cases in which we have been able to resect the hernial portion without the patient feeling any effect afterwards. The book of Dr. Mignon contains a typical and very interesting example of this.

It is also useful to establish what ought to be the line of conduct of a surgeon in presence of cerebral hernias, which are often fairly voluminous. Should he try to reduce them, which is not easy; should he on the contrary help their elimination by ligaturing their base or resecting them with the knife or the thermo-cautery? Such are the interesting problems which must be resolved, for they are in the highest degree important to the aural surgeon who finds himself in face of cranial complications consecutive on suppurative otitis.