NEUROSURGICAL CLASSICS—II

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In the August 1962 issue of the Journal of Neurosurgery the “Case of Cerebral Tumour” reported in 1885 by A. H. Bennett and R. J. Godlee was reprinted and relevant references were given. In the present issue the abstracted discussion of this case by Hughlings Jackson, David Ferrier, William Macewen and Victor Horsley is reprinted, together with the reports by Macewen and Francesco Durante of their first excisions of intracranial tumor, which preceded Godlee’s operation.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY*

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GEORGE JOHNSON, M.D., F.R.S., President, in the Chair

Case of Cerebral Tumour. By A. HUGHES BENNETT, M.D. The Surgical Treatment. By RICKMAN J. GODLEE, F.R.C.S.—The chief features of interest in this case were that, during life, the existence of a tumour in the brain was diagnosed, its situation localised, and its size and shape approximated, entirely by the signs and symptoms exhibited, without any manifestations of the growth on the external surface. The growth was removed by a surgical operation, without any immediate injurious results on the intelligence or general condition of the patient, who lived, relieved of his former symptoms, for four weeks, and at the expiration of that time died, not from any special failure of the nervous centres, but from the effects of a secondary surgical complication. . . . The general conclusion arrived at was that, although in this instance life was not permanently preserved, the fact remained that the operation at once removed all the painful and distressing symptoms, without causing any injurious effects on the general health or nervous system of the patient. From the experience gained by this case, as well as from observations in other directions, the authors expressed the opinion that there was a hopeful future for cerebral surgery; and that there was every prospect, in other cases of a similar nature, of permanent relief being afforded, and life prolonged, in a class of disease at the present very distressing, and uniformly fatal.

Dr. HUGHLINGS JACKSON congratulated Dr. Hughes Bennett on the accuracy of his diagnosis. The operation Mr. Godlee performed showed that Dr. Bennett was right in saying that a cerebral tumour might, so far as the operation itself went, be safely removed. The patient, most unfortunately, died, but he died of a secondary surgical complication. Dr. Hughlings Jackson also warmly congratulated Dr. Ferrier, from whose researches the tumour was localised. Speaking more generally of localisation of cerebral tumour, with regard to trephining, Dr. Hughlings Jackson said that there was a kind of monoplegia, often passing into hemiplegia, which was almost decisive evidence of tumour; a paralysis beginning very locally, for example, in the thumb and index-finger, and spreading very slowly, week by week. In such a case he should not advise trephining, since there would be a great probability of a large tumour in the centrum ovale; not certainly, for he had seen such hemiplegia in a case of tumour growing from the dura mater, pressing down on the cortex. The convulsive seizures of localising value were not cases of epilepsy proper, but epileptiform seizures—convulsions beginning one-sidedly and very locally, in the hand, or check, or foot. Whilst the seizures pointed with certainty to disease of the opposite cerebral hemisphere, they did not always occur from such gross disease as tumour. In some, there was local softening. When, however, there was also double optic neuritis, such gross disease as tumour might be confidently predicted. Even yet there was not evidence of exact position. Dr. Hughlings Jackson had not yet seen a case of epileptiform seizure caused by disease outside Ferrier’s region; but such cases had been recorded by great authorities. Hence, repeating in effect what Charcot and Pitres had urged, we required also some local persisting paralysis of the part convulsed—persisting, since temporary paralysis after a seizure was no further help towards localisation. So far, then, three things were required; local persisting paralysis, epileptiform convulsions, and double optic neuritis.

Dr. Hughlings Jackson mentioned the case of a man who had had convulsions and paralysis of one arm; a tumour, a cubic inch in bulk, was found involving the hindermost part of the uppermost frontal convolution. This was before Hitzig and Ferrier’s researches; the exact position of the tumour was not diagnosed. That tumour might probably have been removed with safety; yet there was considerable softening. Moreover, there was a tumour in each lateral lobe of the cerebellum, although there had been no cerebellar symptoms. Another case, in which a woman had very many convulsive attacks of one arm (and later wider seizures), was mentioned. In this case Dr. Hughlings Jackson correctly predicted tumour of the hindermost part of the uppermost frontal and adjacent ascending frontal convolutions, but not with the confidence he should have done Ferrier’s researches then been made. The tumour was about an inch in diameter, and had it been removed, very likely the woman’s life would have been saved. She had not double optic neuritis, but, making an exception to a former statement, were he to observe a case of repeated convulsions nearly always limited to one arm, exactly alike at each recurrence, he should, even

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without double optic neuritis, consider them to be, in all probability, tumours in the region mentioned. In another case he had correctly diagnosed tumour of the same region, but there were also other tumours in that half of the brain. Admitting difficulties—that the tumour might be very large; that there might be softening about it, that besides the tumour localised there might be others—yet, in a case where the tumour was evidently going to kill the patient, when there was intense pain in the head, and when, as sometimes happened, the patient had twenty or thirty fits a day, the patient would consent to risk something, and a surgeon might justifiably operate. Dr. Hughlings Jackson remarked that, after operation in such cases as he had mentioned, there would, he thought, be some permanent paralysis, but this was little in comparison with the misery of pain, the torment of repeated fits, and great danger of death. In conclusion, Dr. Hughlings Jackson said that in a case of convolution limited to one arm, or beginning in one leg, with some persisting paralysis of the part first convulsed in the seizure, and double optic neuritis, he should diagnose tumour or other such gross disease of the upper part of the Rolandic region, and should seek surgical advice as to the propriety of trephining, not forgetting to state prominently the three difficulties mentioned.

Professor Ferrier had seen the case in question before, during, and after, the operation, and congratulated Dr. Bennett and Mr. Godlee on the large measure of their success. The operation, as an operation, was wonderfully successful, and was borne without any serious depression. He had always maintained that as possible; for he thought the operations on man not more or less serious than on animals, and his own experiments on animals had included many in which, with careful precautions, inflammation had not resulted. As bearing on treatment by trephining, he cited a case from his patients in King's College Hospital this year. The man had grave symptoms, gradually increasing to complete paralysis of the left side, pain in the right frontal region, double optic neuritis, and almost complete coma; the right eyeball was rather fuller than the left. The symptoms were attributed to some growth pressing on the sphenoidal fissure, whether from above or below could not be determined. Sir Joseph Lister agreed to make an exploratory operation. As soon as the dura mater was incised, the brain bulged out, and, as soon as he put in his finger, there was a rush of fluid out of what seemed to be a cyst, but was really a very greatly dilated anterior horn of the ventricle. There were great reduction of pressure and relief of paralysis, but no further operation could be attempted. The left arm gained some power, and for a time the coma lessened; but in a week death ensued, not from surgical complications, but from the tumour, which was found to press upwards on the sphenoidal fissure. It would have been reached if the finger had penetrated half an inch deeper, but was too large to be removed. The case, however, showed the safety from surgical complications.

Dr. William MacEwen called attention to some cases which had been referred to by the papers in connection with the case of Dr. Bennett and Mr. Godlee. In 1876, he had seen a case of wound of the frontal region, resulting in symptoms of abscess in the third frontal convolution. He failed to get leave to operate, but after death found that the operation he had planned would have reached the abscess. Since then, he had had a series of cases, in which the researches of Dr. Hughlings Jackson and Professor Ferrier, and of MM. Charcot and Pitres had greatly assisted him. He read a detailed description of two cases. The first was of a woman aged 25, who had left hemiplegia from syphilis contracted about four years previously. There was first tingling of the left arm and then of the left leg, and afterwards a peculiar sensation of the parts, which the patient called numbness. Lastly, there was gradual loss of power of left arm and left leg; languor and dulness of intelligence. From these he inferred cortical lesions, probably gammata, in the parts controlling arm and leg, namely, the upper half of the ascending frontal convolution and paracentral lobule. After three weeks, he trephined over this region, and found the internal table of the bone removed to be rough, and the dura mater thickened in consequence. Over the surface of the ascending frontal convolution was a yellowish opaque effusion, very friable, this also bridged the fissure of Rolando. Towards the paracentral lobule was a resistant portion, into which incision was made, and followed by a gush of grumous fluid. On the internal table of the bone, osteophytic growths were found, and a second crown of the trephine taken out to remove them. The excised bone was broken up into small pieces, and reimplanted in the brain-tissue; the wound was supplied with a chicken-bone drainage-tube, and the whole carefully dried and dressed with iodiform. In forty-eight hours there was much relief; in a week she could move her toes and fingers, and, in a fortnight, could flex her leg a little. The temperature remained normal, and the dressings were not touched for three weeks; when they were changed, the wound was found to be almost healed, but fresh dressings were kept on for three weeks longer. After two months, she could walk easily, though with a slight dragging of the leg, and since then had grown strong enough for her ordinary household duties. The second case he had not time to describe in detail, but its essential points were the same as in the other. It was after an injury, round which arose an encephalitis and lepto-meningitis. The left arm was paralysed. The skull was trephined, and many minute clots were found in the left ascending frontal convolutions. The recovery was complete. Professor Ferrier had asked how many times he had had hernia cerebi in his cases; he had never had it as the result of an operation, but once it occurred immediately on opening the dura mater, under which there was encephalitis in the motor area. He had operated on seventeen cases for the relief of intracranial pressure; in fourteen by trephining; in three by elevation of the bone; fourteen had recovered. In eleven, he had divided and reimplanted the portions of the excised bone. He should hesitate to use a galvanocautery to the brain-tissue.

Dr. Hughes Bennett thanked the Society for the kind reception they had given to his paper. He had been much interested with Dr. MacEwen's cases, but felt obliged to say, with all due deference, that they did not appear to him completely analogous. The chief lesson to be learnt from his own case was that a small lesion could be diagnosed and cut down upon; in Dr. MacEwen's cases, the injuries were much more extensive; they were, however, very encouraging to cerebral surgery. He wished to call the attention of the Society to a brain exhibited on the table, taken from a case treated by his colleague Mr. Richard Davy. The skull had been trephined, and eight pieces of bone were extracted from the cortical tissues that had been jammed into them by a
severe accident. A cavity resulted, that was big enough to hold a pigeon's egg. The recovery was absolute, but no antibiotics at all had been used; the patient's head lay on a water-pillow, without any dressings; yet there was no encephalitis or meningitis, or softening, only a dense cicatrix. The subsequent death of the patient was in no way due to this injury or operation, but was brought about by an attack of pleuroneumonia.

Mr. Victor Horsley remarked that the last case Dr. Hughes Bennett had mentioned was not strictly analogous to those cases where the head had not been injured before; for, after injury, adhesion might take place, which would guard the brain against further inflammation. His experience in experiments on animals led him to agree with Professor Ferrier in thinking that animals were as liable to complications of cerebral operations as man. The subcutaneous use of morphia, however, in animals diminished the haemorrhage by about one-half, by inducing contraction of the arteriolas, which generally bled freely; and that, he thought, was a hint for the management of cerebral operations in man.

Mr. Godlee congratulated Dr. Macewen on his interesting and successful cases. His operations led to less haemorrhage, as involving incisions into abscesses, rather than into healthy tissue. He felt a doubt himself whether the use of the galvano-cautery did not lead to inflammation and hernia cerebri, though Dr. Ferrier's case showed that there might be hernia without inflammation. As to the deeper parts of the tumour, they had been lucky in finding a gloma so accurately limited. A salt-spoon would have been a more convenient instrument for removing it than a small and sharp-edged Volkmann's spoon. Professor Ferrier's and Mr. Horsley's experience furnished an argumentum ad simiam, but he could not feel justified in admitting that it applied exactly to man. He thought Dr. Macewen's system of drainage deserved consideration, and also his careful attention to the condition of the scalp before the operation. In his own case, he considered putrefaction to have occurred owing to a certain want of care in cleansing the head before the operation; and, if he had to do the same operation again, he should soak the scalp for twenty-four hours in a solution of corrosive sublimate, and afterwards of carbolic acid; and, under such conditions, should not hesitate to undertake a second similar operation.

**INTRA-CRANIAL LESIONS, ILLUSTRATING SOME POINTS IN CONNECTION WITH THE LOCALISATION OF CEREBRAL AFFECTIONS AND THE ADVANTAGES OF ANTISEPTIC TREPHINING.**

*By William Macewen, M.D. Glas., Surgeon and Lecturer in Surgery to the Royal Infirmary, Glasgow.*

**III. TUMOUR OF DURA MATER.**

Epileptiform convulsions; trephining; removal of tumour from dura mater and orbital cavity; recovery.—This patient was a girl about fourteen years of age, who was admitted into Ward 22, Glasgow Royal Infirmary, on July 22nd, 1879, suffering from a swelling at the upper and inner portion of the left orbital cavity. Her object in seeking hospital treatment was the removal of this small tumour. It was about the size and shape of a kidney-bean, its flat surface lying against the roof of the orbit, and extending inwards under the orbital plate of the frontal. It seemed firmly fixed to the periosteum, and it had a fibrous feeling. The pupil of this eye was constricted, and exhibited little response to light. When the finger ran over the surface of the brow, a prominence about the size of a large barley-grain was felt about two inches and a half above the supra-orbital ridge. This little body was firmly fixed to the periosteum. She complained of a dull fixed pain confined to the left side of the brow. Her history showed that she had been treated for months previously by large doses of iodide of potassium, but, notwithstanding, the pain in the left side of the forehead became worse, and the tumour in the orbital cavity increased. The contracted state of the left pupil and the pains which she experienced over the front of the left side of the brow presented a probability of the presence of intra-cranial pressure, as the small tumour in the front of the orbital cavity could scarcely produce these. She was therefore advised to remain in the ward for observation. A few days after, while sitting at the bedside, she uttered a cry, and immediately the muscles of the right side of the face began to twitch, the right arm was firmly flexed, and violently twitched. The twitchings lasted for two or three minutes, and were entirely confined to the right side. An interval of ten minutes elapsed, when the spasms reappeared in the right side of the face and on the right arm, lasting for about fifteen minutes. Two minutes after a third attack ensued, this time involving the whole of the right side of the body. These attacks began to be more prolonged, and the interval between each shorter, until they became continuous, the whole body becoming implicated in a general convolution. Simultaneously with the commencement of the convulsions she lost consciousness, which continued throughout the attack. Towards the end of the third hour from the commencement of the attack the face became livid; the respiration extremely slow; the pulse slow, irregular, and feeble. These symptoms were evidently increasing, and a fatal issue seemed imminent. Her temperature during the last two hours increased at the rate of a degree each hour. At 8.30 it was 103.4°.

Under these circumstances trephining was determined on. The barley-sized node over the left side of the frontal was selected as the seat of operation. In cutting through this node it was found to be gummatus in appearance, and to extend over the frontal in a flattened form continuous with the pericranium. The bone underneath this little tumour was found to be rough and imparted a softer feeling to the finger than usual. A trephine having a disc an inch in diameter was chosen and a portion of bone was elevated. The trephine opening had a diameter of an inch in thickness and three-quarters of an inch in breadth. From this point it tapered down to about one-sixteenth of an inch in thickness, while its breadth increased, so that it appeared like a leaf spread over the surface of the dura mater. The tumour was removed from the dura mater as far down as the orbital portion.
of the frontal, the dura mater being gently pressed aside to permit of this. The suprorbital tumour was then removed. In doing so it was found to have a firm attachment to the orbital plate of the frontal, and it was seen to be continuous with the barley grain-sized nodule on the left side of the brow, the connexion between these two points being about a millimetre in thickness, but having a superficial square area of about two inches. It was difficult to separate this without removing the pericranium, which consequently was removed in several places. The skull was roughened and softer than usual over this portion. After the whole of the tumour was removed, drains were introduced and the parts were brought together by sutures.

After recovering from the influence of the anaesthetic the convulsions did not return. Next morning, twelve hours after the operation, the patient's temperature was 99.6°. She was perfectly conscious, answered several questions intelligently, lifted her head to get dressed, and stated that she felt well. Her right side, however, remained completely paralysed.

On the fifth day after the operation her temperature began to increase shortly after she had been dressed. In an hour after she became aphasic, and the convulsions returned. When this made known to me I visited the hospital and removed the dressings, which had been applied with a little pressure over the wound, in order to reduce a slight bulging which appeared at the trephine aperture. An hour afterwards her condition was greatly improved, the convulsions had ceased, and consciousness was restored. From this time she gradually improved, the paralysis of the right arm and leg passed slowly away, and her intelligence became perfect. The wounds were finely healed in a month from the date of the operation; but she was kept "assisting" in the ward for another month, after which she was dismissed. From that time till now she has visited the ward to report her condition at least once monthly, and she has continued in good health down to the present. She is engaged in regular employment.

The indications which led here to a probable locus of brain pressure were: (1) The contraction and fixity of the left pupil. (2) The presence of a suprorbital tumour of a gummatous character and of a small nodule of probably similar consistency on the left side of the frontal. (3) A fixed dull pain on the left side of the brow, between these two tumours. (4) Convulsions commencing on the right side of the face, and afterwards involving the right side of the body (though ultimately becoming general).

CONTRIBUTION TO ENDOCRANIAL SURGERY*1

By F. DURANTE
Professor of Surgery

In May, 1884, C. B.—, a woman, thirty-five years of age and a native of Narni, came under my care. Her general appearance was good; she seemed well nourished,

although not of a very robust constitution. Externally, she showed no abnormality, except as to her left eye, which appeared somewhat low and drawn outwardly, otherwise the movement as well as the functions of the globe were normal. This deformity had manifested itself only within the three months previous to her visit to me. For a year or more however, she had entirely lost her sense of smell, her memory had become impaired, particularly as to remembering names, and she experienced a peculiar sensation of vacuity which caused her to feel uncertain in her movements. Motion, sense of touch, and sensibility to heat and pain remained natural. From her husband I learnt that she had somewhat changed in disposition; that from being generally happy and bright, she had become sad, melancholic and taciturn, although she did not seem to brood over the state of her health. The senses of hearing and taste, and the functions of the chyloloeptic visera were perfect; also nothing abnormal was found on a close examination of the nasal and pharyngeal regions. The course of the disease, the loss of memory and of the sense of smell, and the objective and subjective state of the patient led me to believe in the presence of a tumour within the cranium, the pressure of which affected the anterior lobe of the brain and paralysed or destroyed the olfactory nerve. Moreover, the displacement of the globe of the eye led me to believe also that the tumour had penetrated the superior arch of the orbital cavity. Such being my diagnosis, I now proposed to the patient an operation that would remove the offending object, explaining to her the gravity of the operation without reserve. She was brave, and she consented.

To reach the tumour it was necessary to make a large opening in the left frontal bone; so with an incision commencing from the inner angle of the left orbit upwards nearly to the hair line as far as the temporal region, I raised all the soft tissue from the bone in a flap. The bone being exposed, with a sharp scalpel and hammer I removed a large portion of it, commencing at the superior orbital margin, inferiorly, and found that the internal parietes of the frontal sinus had been forced outwardly. The dura mater being now exposed, I examined it, and found that it had been perforated by the tumour just opposite the frontal eminence. With great care I now began to scoop out the tumour. As soon as a considerable portion of the tumour was removed, I detected that it did not adhere beyond the internal surface of the dura mater, and that therefore its enucleation was comparatively easy; and then removed it and carried with it all the adherent portions of the dura mater. The haemorrhage was slight and easily controlled by the haemostatic, a tampon treated with sublimate. The tumour was lobular, of the size of an apple, and weighed seventy grammes. It occupied the anterior fossa at the base of the left cranium, extending to the right and upon the cribiform lamina, which it destroyed. Posteriorly it extended to the gienoid tubercles before the sella turica. The left anterior cerebral lobe was greatly atrophied; the orbital arch was much depressed, but not perforated by the tumour as I had anticipated. Having stopped the bleeding completely, I now united the wound by first intention, leaving in the cavity occupied by the tumour a drainage tube, which descended to the left nasal fossa through the opening made on the ethmoid by a prolongation of the neoplasms; then I closed the nasal cavity with an iodoform tampon. The operation lasted about an hour.

* Reprinted from The Lancet, 1887, 2: 654—655, with the kind permission of the Editor.

1 Paper read in the Surgical Section of the International Medical Congress held at Washington, U.S.A., September, 1887.
The patient bore the chloroform very well, showing only the weakness following the use of an anaesthetic and attendant upon loss of blood. On the third day she had fairly recovered, and the wound was healing without suppuration. The drainage worked well, a large quantity of serum tinged with blood flowing through it. On the fourth day, however, the patient was overtaken by sudden prostration, was inclined to sleep, exceedingly disinclined to talk, and complained of mental confusion. I then discovered that the drain had stopped during the night, so I at once removed the tampon, replacing it, however, further down the nasal cavity. The effect was good; the serous fluid began to drip again. Not satisfied with this, I applied a gum-elastic "pump" to the external opening, and drew off about thirty grammes of liquid. The flow was thus re-established, and continued all the following day and night. On the renewal of the flow the alarming symptoms disappeared as if by magic. On the seventh day I removed the stitches and the drainage tube, and on the fifteenth day the patient returned to her home, doing very well. She had lost that sensation of vacuity around her person which made her uncertain in her movements, but had not regained her memory or the sense of smell.

Three months after I presented my patient to the Chirurgical Society at its meeting in Perugia in 1884. She was in a happy frame of mind, and willingly related her experience. She stated that now all her faculties and moral conditions were normal, and that she had even regained her sense of smell. This greatly surprised me, for I felt sure that I had destroyed the left olfactory in removing the tumour, which had destroyed the cribri-form lamina of the ethmoid. Upon experimenting, however, with aromatic substances, we found that she could only smell with the right, and that the left was totally insensible, its olfactory having been destroyed either by the pressure of the tumour or by the operation itself. The part of the bone which had been removed was now partially reproduced, the cavity in the region of the operation had disappeared, and the eye had regained almost entirely its normal position. The tumour, under the microscope, presented a multiform fibrocellular structure of sarcoma.

It is now four years since that operation was performed, and my patient is in perfect health. My diagnosis and the operation, apparently so hazardous at the time, are therefore justified by the result. And, though such operations have generally failed, the success of mine should secure proper consideration at the hand of modern surgery.

The progress of experimental pathology and of studies of cerebral localisation every day now smooths our way to the diagnosis of cerebral diseases, so that the cranial cavity may in future justly enter into the dominion of surgery. The frontal and parietal regions can now be successfully attacked by the scalpel of the surgeon, and many affections of the meninges become trophies of rational surgery.