CLINICAL CONTRIBUTIONS TO THE SUBJECT OF BRAIN-SURGERY.

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PSYCHOPATHIC EQUIVALENT OF EPILEPSY: DEMENTIA EPILEPTICA.

Under this head recent writers have included cases not of distinctly epileptic type, but of paroxysmal, emotional, and epileptiform character, the attacks coming on sometimes with and sometimes without auræ or other premonitory symptoms. I have operated upon three well-marked cases of this character within the past few months.

The first was in a man of thirty-one, who, July 20, 1891, was kicked in the left side of the head by a horse, and who some time later was found unconscious. He was carried into the house, and was aroused. He had no paralysis, but in three days began to act strangely and soon became wilful and almost violent. He developed erotic tendencies, and growing rapidly worse could not be kept at home. On July 28th, he was sent to me by Dr. Krehbiel, of Yorkshire Center. At this time the patient was difficult to control and mildly maniacal. July 29th, I found a depressed area on the left side near the parietal eminence and a little anteriorly to it; yet he had absolutely no motor symptoms. At this point there was an H-shaped scar. Immediate operation was done under chloroform. Beneath the scalp I found a depression about the size of a half-dollar, around which I chiselled so as to entirely lift and remove the depressed portion. The bone was well comminuted; there was a small clot beneath the bone, but none beneath the dura. The bone was not replaced and the wound was closed without drainage. He made a rapid recovery; returned home in one week with his mind nearly clear and his disposition as it had been before the injury.

My second case was in a man of forty-five, who, when a young man, had had an extensive compound fracture of the skull, and who for a while was under the observation of the late Dr. Gray, of Utica, who advised against operation, in accordance with the practice of his day. Of late years the man has developed distinct epileptiform seizures followed by violent maniacal attacks, during which he was positively dangerous, so that his family lived in constant fear; moreover, his disposition and temper seemed to be gradually changing under this stress, and it got to be a question whether he should submit to an operation or be sent to an asylum. He was placed in my hands for operation by Dr. Putnam. This was made during October, 1891, the depressed bone being removed, adhesions separated, and a portion of the scar exsected. The change in this case for the better has been most marked and most gratifying. While it is too much to say that he has not had a single seizure since the operation, they have been reduced to very mild and very rare attacks, and I believe it is now some months since he had anything that could be called a fit. In temper and disposition he is also quite his old self again.

A third case is one very recently operated on, so that I cannot report final results. A man of about thirty, had at the age of five sustained a bad compound fracture of the left side of the skull, and was so profoundly and long unconscious that for two or three days absolutely nothing was done for him by the physician in his community. He married some twelve years ago, and since his marriage has had nearly weekly attacks of faintness, but never of convulsive character, which have been followed by sullenness and manifestations of quick temper that have greatly alarmed his family. Inasmuch as there was about the head at the site of the old injury a dense and depressed scar, I ascribed his nervous symptoms to the remote effects of injury, rather than to those of his marriage. In his case I completely dissected out the scar, trephined and removed a small circular depression of bone, inserted a piece of gold foil, slipping its edges beneath those of the bone, and closing the wound as usual without drainage. Up to the moment of publication, this case has done uninterruptedly well.

Linear Craniotomy, or Craniectomy.

My experience with this new and radical procedure has been sufficiently varied and interesting, even important, to justify individual report of each case. I will first give them in the order of their occurrence.

Case I.—J. V., aged three and one-half years, was referred to me by Dr. Crego. As a baby he was restless and "jerky," and when nine months old had convulsions of the entire body. As he grew older he would sometimes fall in some of the attacks. These slowly assumed the conventional epileptic type, and by the time he was three years old, or in March, 1891, were perfect examples of *grand mal*. They also increased in frequency and severity. At that time he began staggering in his gait, and his left leg grew weak. Soon after it showed relative decrease in length and size. His temper became violent and uncontrollable, his epileptic seizures more and more frequent, and during the twenty-four hours previous to the operation he had between thirty and forty distinct and severe seizures. Though he was by no means an imbecile, his mental development was retarded. His skull seemed relatively small for his age. On June 21, 1891, I operated on him at the General Hospital. A long incision, one inch to the right of and parallel with the middle line, was made from the forehead to the occiput. With cutting bone-forceps I excised a strip of bone 2 cm. wide from the line of growth of hair in front nearly to the occipital protuberance behind. Then detaching the scalp for the purpose, I excised a narrow strip of bone over the fissure of Rolando on the right side down nearly to the temporal fossa. The wounds were closed without drainage. During the ensuing twenty-four hours shock was severe, and the child had several violent epileptic seizures. Since this first day he has never had another. His irascibility has subsided, his general health and intelligence have improved; he now runs, plays, acts, and talks just like other children of his age.

Case II.—Minnie R., aged four years, was referred to me by Dr. Putnam. This was a case of congenital microcephalus and imbecility. The parents were healthy, and the family history was good, the previous children being sound. This girl had scarcely ever spoken a word, and manifested no more intelligence than an infant of three months. Her fontanels closed very early. She leads a vegetable sort of existence—without disturbance of function. Operation here seemed much less hopeful than in the previous case; it was, nevertheless, undertaken July 13, 1891. An incision was made 3 cm. to the left of the middle line, from 4 cm. above the left supercilliary region to the occipital protuberance. A strip of bone was excised much nearer to the middle line. After removing it the scalp was pressed away on the left side and a strip excised over the Rolandic fissure. I then made an incision over the right Rolandic fissure, and excised another strip of greater length, the three lines of defect having a common meeting-place. The central grooves were cut with forceps, the lateral grooves with a chisel. There was no great hemorrhage, and the wounds were closed without any provision for drainage. The child nearly collapsed after the operation, and for two days required constant attention. The after-results in this case have been practically *nil*. There has seemed to be a perceptible improvement in intelligence, and the child has appeared a little more alive to what is going on about her, and this is about all that can be said.

Case III.—W. K., aged eighteen years, was referred to me by Dr. Crego. From an early age the patient's mental development has been very disappointing. He is physically large and well developed, but mentally shows scarcely more intelligence than a child of two or three years. At the age of about five he first showed epileptic manifestations. His seizures were then few and far between. They gradually increased in frequency, until now he has several in one day, but may possibly go a few days without any. His temper is usually good, but at times he is excessively wilful. The upper portion of his cranium is relatively small, though not conspicuously so. The muscles of his right side are somewhat atrophied. It seems that his epileptic fits have been somewhat more violent on the right side than on the left. His personal habits are good, as is also his family history. Dr. Crego and myself both thought that an extensive cranial opening might give relief, and the experiment was proposed and accepted by the father. Operation was done October 20, 1891. A long incision was made to left of the middle line. When I endeavored to make a longitudinal division of the skull, commencing with a common amputating saw, I found that the bone was very thick. I then applied a trephine over the motor area, and, through the opening thus made, with chisel and gouge-forceps removed a portion of bone, some 5 cm. in diameter, and in shape like a spherical triangle. Through a small opening in the dura I found that there were no adhesions, but that the arachnoid and pia were succulent and edematous. I started to make a longitudinal excision of bone, but finding the same to be 1 cm. thick, desisted from this attempt, and tried to make simply a large relief-opening. The wound was closed with catgut, and an ice-bag applied outside the dressing. At 6 P.M. the boy was somewhat restless, and had a fit. This condition became more marked, and by midnight, in spite of considerable morphine and other sedatives, he was convulsively restless and violent, and required both a straitjacket and chloroform. At 4 A.M. he died of exhaustion.

Case IV.—J. M., aged fifteen years, was healthy until he was three years old. Then his nurse used to frighten him, and he grew to be very nervous and timid. He soon began having fits every night, until he was thirteen years old, when they occurred in the daytime also. Shortly after this he was having from thirty to forty fits every day. During one of these he fell and broke his elbow, which is now partially ankylosed. He also cut his forehead to the bone. For the last two years he has been lying most of the time helpless in bed, and has had to be fed. His symptoms, mental and

convulsive, seemed to occur in cycles of about three weeks each. During the first week of the three he would be noisy, in the second he would be weeping and wailing, and during the third apathetic and almost unconscious. He rarely spoke. All the the children of this family were rhachitic. November 2, 1891, the boy was brought to my clinic in this third stage, and it seemed impossible to arouse him. He took mechanically most of what was put into his mouth. His bed was constantly soiled. His arms, and sometimes his legs, were nearly always in the athetoid condition, and any little disturbance would bring on a mild seizure, during which his arms were drawn up over his head. There were no scars over his motor areas. November 7, 1891, the operation was carried out at clinic. A long incision was made to the left of the middle line, and after a first opening of the trephine a long strip of bone, 1 cm. wide and 13 cm. long, was removed just to the left of the longitudinal sinus. The operation had to be discontinued because of collapse. The patient stopped breathing, nearly died on the table, and was revived with great difficulty. The wound was closed as rapidly as possible. He seemed better the same evening, but next day the athetosis continued; he became uneasy, and died, twenty-six hours after the operation, of shock.

Case V.—S. P., aged nine years. This patient is of Russian-Jewish parentage, his father being an educated man, and the other children healthy. He presents a defective skull-development, especially over the left frontal lobe; is imbecile and epileptic; has seizures coming on about every five days. His forehead slopes backward so as to give him somewhat the appearance of an Aztec child. Mentally he is an imbecile, mutters half a dozen words, staggers about the room, but in disposition is good-natured and even confiding. He was operated upon November 14, 1891, at my clinic. In this instance I varied the ordinary procedure in that I laid up a V-shaped frontal flap, its apex reaching nearly to the vertex of the skull, its extremities extending nearly to the external angular processes. Then a small trephine was applied on each side of the middle line; the opening thus made was connected across the longitudinal sinus, and then two strips of bone were excised in a direction parallel to the scalp-incisions, by which considerable spring was given to the frontal bone and the fragments of others attached to it. The operation proceeded without incident, and the first dressing was not made until eight days later, when perfect union was found. The immediate effects in this case were not very pronounced; the seizures, however, became less frequent and less severe, and when the boy left the hospital a few weeks later he had lost his staggering gait, and his various actions and attempted speech showed much more fixedness of purpose than was previously the case. But at the end of a year the results in his case have to me been astounding. He has had no fit for three months, and within a week or two was again exhibited at my clinic. He came up to me and publicly asked in clear and distinct tones whether he could go to school. I held some conversation with him before my class, in order to show that he was capable of rational thought and rational and even accurate conversation. In addition to this he has developed physically, and his face now has a really intelligent expression, whereas a year ago it was expressionless.

Case VI.—C. S., aged twelve years, of Warren, Pa., was sent to me by Dr. Baker. This child was also an imbecile, speaking but few words, being at times irascible, and having at times frequent epileptic seizures. There was partial paresis of the left arm, although she used it more or less. In her case there was great asymmetry, there being a great depression over the right side. She was operated on the same day as the previous case at a special clinic given for these two cases, and a strip of bone about 1 cm. wide was excised to the right of the middle line, extending well backward and forward into the frontal bone. The dura was not opened. At the first dressing, one week later, perfect union of the wound was found, and a light dressing only was applied. A few hours later she got restless and tore this off, and then picked the wound open so that it gaped for its whole distance. It was immediately re-dressed after disinfection with hydrogen dioxide, but healed the second time by the slower process of granulation. During the few weeks of her stay in the hospital she improved a little. A letter from Dr. Baker, dated October 25, 1892, nearly a year later, states that "she is no better now than she was before operation. For the first three months after operation there was a marked lessening in the number of paroxysms, but for the last three months the convulsions have been both severe and frequent, she having several daily. She is in much the same condition mentally that she was before operation."

From the foregoing reports it will be seen that I have had six cases of this general character, of which two were promptly fatal, two have been practically unaltered, and two have been brilliantly successful beyond all expectation. Of the two fatal cases I can only say that they belong to a class of patients about whom in general we feel that death is vastly preferable to such a life, and while I think that the second case might have been benefited had he survived the shock, I regard the first as having been essentially and absolutely hopeless in every respect. Save in a purely personal sense, I have no regret for the operation, which was freely assented to by the parents. In fact, in every one of these cases the parents have been made fully aware of the difficulties and dangers, and have in every instance said that they would rather lose their children than see them live in the condition in which they were at the time of the operation.

The two cases in which no result has been noted I suppose must be regarded as belonging to the class of cerebral atrophies that have been stigmatized by Dr. Starr as essentially hopeless. In both of these cases the principal regret of the parents is that their children survived the operative ordeal.

Of the two successful cases any man might well feel proud as having contributed to such marvellous changes. They are of themselves sufficient reward and justification for a score of unsuccessful cases, and lend an element of hope in similar instances of which the profession should not be deprived.

CASE VII.—Since writing the foregoing I have operated upon an infant of fourteen months who was born during a natural labor, of a healthy mother who had borne other healthy children. The child shows no ordinary signs of rickets, but its fontanels closed very early, and it shows scarcely any more sign of intelligence than does a vegetable. It seems to recognize the difference between light and darkness, to have the sense of hearing reasonably acute, and is physically in good condition. Her principal evidence of life and activity is her constant crying at night, so that her mother told me that she has had practically no rest since the child was born. In this instance the father said to me, with tears in his eyes: "Do all you can, and be sure to do what you think is enough, without stinting operation; for I had rather bring the child away from the hospital in a coffin than in this condition." Operation was made the same way as in Case V, but the child, who stood the operation well, collapsed, and died suddenly the same evening.

Without prolonging this paper to too great an extent, I desire before closing to invite attention to a few conclusions, the results of my deliberate convictions and reflections upon this kind of work.

1st. We have not yet learned the possible limits of brain-surgery, so-called, or the possible limits to which we may with reasonable safety interfere with the functions of the brain or its component parts. Final knowledge in this respect will come probably rather through clinical experience than through experimental investigation.

2d. I have had a number of brain-cases whose history shows that at the time of reception of injury the symptoms were so serious and severe as to lead the medical attendants to consider the case hopeless, so that practically nothing was done. I wish to say all I can to condemn this apathetic course, and to urge that the most desperate case be attended to at once, with the same attention to detail as though it were quite hopeful in its outlook.

3d. In many of my own cases, and my experience is like that of many others, the mental or other disturbance that has finally led to operation has been allowed to run along, often for years and years, and patients have been brought to the surgeon only as a last resort. This course is as unwise in these cases as when we deal with malignant disease, and the profession generally should learn that the prognosis would be very much more favorable in such cases were they operated upon when these disturbances first make their appearance.

4th. Personal experience has convinced me that when I have erred in operating for epilepsy or psychic disturbance, it has been rather on the side of doing too little than too much. For instance, in one of the cases alluded to under the caption Epilepsy, in which no improvement was manifested, I am now sorry that I did not take out so much of the arm-center as to produce at least temporary paralysis of the arm. In other words, I have never regretted doing too much, but in several cases have regretted not doing more than was done.

5th. I wish again to insist upon the necessity of long-continued medicinal and dietetic treatment after these cases have passed out of the hands of the surgeon.