

The surgical treatment of idiocy / by G.E. Shuttleworth.

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THE SURGICAL TREATMENT OF IDIOCY.

BY

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THE SURGICAL TREATMENT OF IDIOCY.

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The fact that considerable attention has been drawn of late years, both in the medical and lay press, to the subject of operations undertaken for the relief of idiocy and other mental deficiencies of child-life, must be my excuse for taking up the time of this section with observations resting, not alone upon my own limited experience, but largely on that of others. The operation of craniectomy, or as some prefer to call it linear craniotomy (that is the cutting out of strips of bone from the skull), has, indeed, almost passed from the domain of science to the region of romance, and articles have appeared in several of our popular magazines under such sensational titles as "Creating a Mind," which have led parents of mentally-deficient children to form extravagant conceptions of the powers of surgery in this direction. It may not, therefore, be inappropriate for medical men to weigh and measure the evidence which has accumulated during the last five years as to the possibilities and impossibilities of operative interference in these cases.

By way of illustration of the popular view of the subject, I may here quote a few lines from an article by Miss Helen Gardener in "Harper's Magazine," which, having been widely reprinted in this country, caused many anxious parents of deficient children under my charge to enquire if some good could not be done by "taking a piece of bone out of the skull to relieve pressure." The article is headed "A Wonderful Surgical Operation," and after asking its readers "Can you think of an operation that would create a mind?" goes on as follows:—"The patient was a child about one year old, of good parentage and of healthy bodily growth, aside from the fact that its skull was that of a new-born child, and it had hardened and solidified into that shape and

* Read at the Annual Meeting of the British Medical Association, London, 1895.

size. The 'soft spot' was not there, and the sutures or seams of the skull had grown fast and solid, so that the brain within was cramped and compressed by its unyielding bony covering. The body could grow—did grow—but the poor little compressed brain, the director of the intelligent and voluntary actions of the body, was kept at its first estate. Even worse than this, the struggle within its bony cage made a pressure which caused distortion, and aimless or unmeaning movement. The arm and leg turned in, in that helpless pathetic way that tells of imbecility." Then follows an account of a wonderful craniectomy, both longitudinal and transverse, by an ingenious operator, with the result that "in three days the baby showed improved intelligence. In eight days the improvement was well marked. From a creature that sat listless, deformed and unmindful of all about it, it began to take notice like other children. From an *it* it had been transformed into a *he*. . . . One month after the operation the feet and hands had straightened out and lost their jerky, aimless movements. The child is now a child. It acts and thinks like other children, laughs and coos, and makes glad the hearts of those who love it."

Turning now from the popular to the scientific side of the subject, what do we really know of the history and value of the operation, which, for simplicity's sake, I shall call *craniectomy*? First performed as long ago as 1878 (with good results on a two-year-old idiot), by Fuller, of Montreal, we hear no more of the operation until 1890, in which year cases were reported by Keen, of Philadelphia, and Lannelongue, of Paris. In 1891, Victor Horsley reported two cases to the Annual Meeting of this Association at Bournemouth, and since that date the operation has been repeatedly practised in this country, in France, and in America; less frequently, however, in more cautious Germany.

Originally the view held was that microcephalus (and its resulting idiocy) depended upon premature cranial synostosis, and, in order to release the imprisoned brain, openings in the skull, varying in form and in position—(longitudinal or transverse linear craniectomy, or *craniectomie à lambeaux*)—were made by the surgeon. In spite of the occasional occurrence of prematurely-closed fontanelles, careful anatomical investigation of the skulls of microcephalic idiots lends little support to the view referred to, the fact being that as a rule the skull is moulded to the brain, not the brain to the skull.

Professor Sir George Humphry, of Cambridge, has examined

9 small idiot skulls, and states that he finds nothing to suggest that deficiency in the development of the skull was the leading feature in the deformity, or that the smallness of the bony cerebral envelope exerted a compressing or warping influence upon the brain (see "Lancet," Feb. 16, 1895, p. 425). In the case of a typical microcephalic idiot formerly under my care at the Royal Albert Asylum, who died aged 29, there was not, according to Prof. Cunningham, of Dublin, complete ossification of sutures; and in this and several other cases of microcephalus which have been thoroughly investigated, the convolutions of the brain, such as they are, give no indication of compression, but are free, out-standing, and separated by well-marked sulci. To cut links in the skull, therefore, with the view of promoting brain development is, in the majority of cases of microcephalus, much as if an anxious mother were to try to improve the growth of a stunted undersized boy by cutting holes in his clothes!

The advocates of craniectomy have indeed abandoned the theory of premature synostosis as the *rationale* of the operation, and now allege, so far as I understand them, that the operation excites a sort of "alterative" effect upon the brain, promoting "conflux" of blood, and increasing cerebral pulsation. Keen, of Philadelphia, said in the course of an address to the medical officers of American institutions for Feeble-minded Children, that "When we have an expanding brain and a resisting skull of about equal and reciprocal force, we have the normal condition in children; but if we have feeble children with poorly nourished and feebly-growing brains, in the majority of cases the feebly-growing brain cannot overcome the resistance that the normal brain can." Probably some analogous argument was used by the practitioners of trepanning in pre-historic times, for the Baron de Baye has found in the chalk of the Marne sepulchres containing numerous skulls ornamented with elliptical openings, probably made by means of a flint scraper during childhood. History, unfortunately, is silent as to the degree of brain illumination to which the men of the polished stone age attained in consequence of this peculiar mode of letting in daylight through their skulls!

We can, however, criticise the modern revival of infantile trepanning in view of results recorded during recent years. In 1891, being anxious to form an opinion on the subject, I

visited the clinique of M. Lannelongue at the Hôpital Trousseau. At this period there were unfortunately no craniectomised patients under treatment, but M. Lannelongue kindly informed me that of 25 cases operated on only one had died, and that the greater number of survivors were "manifestly ameliorated." This manifest amelioration I fear, however, may not have been maintained, for after four years there is no further report of the progress of these cases. M. Bourneville, Physician to the Department for Idiots and Imbeciles at the Bicêtre, indeed, refers to the subject (of which he has had ample opportunity of observation) in a clinical lecture in no very encouraging terms. "Generally speaking" (he says) "it seems to me that the surgeons have little knowledge about idiocy in its various forms. We find assigned as reasons for undertaking such an operation as craniectomy the following:—'The condition of the child is so deplorable that it seems hardly any risk to undertake any operation at all which gives a chance for relief,' whilst another remarks, 'So far as I think, it is a very lucky invention, for if we cannot help such children it is better for them to die than to live such a miserable existence.'" These are surgical views *fin de siècle*, and we mention them only to condemn them. The medicine we were taught was the mission to cure, to ameliorate or to cure the sick that are entrusted to us, and not to assume the functions of an executioner." In the last published volume of *Recherches sur l'Epilepsie, l'Hystérie et l'Idiotie* (1894), Dr. Bourneville tabulates 82 cases of craniectomy; of these 14 had died, and in 31 a greater or less degree of "amelioration" had been reported. In too many cases the report of amelioration is made within a few weeks or months of the operation, and, to use the words of the writer of a judicious article in *Cassell's Yearbook for 1895*, "it appears that, as a rule, a certain amount of improvement ensues immediately after the operation, but this is not maintained, and it is quite possible that the final result of the operation is a diminution and not an enlargement in the size of the cranial cavity owing to the fact that great sclerosis and contraction take place along the lines of the wounds." In fact Bourneville has demonstrated in three autopsies of craniectomised patients who ultimately came under care at the Bicêtre that no expansion of the cavity of the cranium is the final outcome of the operation, but on the contrary it is encroached on by exuberance of bony matter thrown out

to repair the breaches made by the surgeon. He maintains that this method of treating idiocy is of little, if any, value, any apparent good results being due to increased care and attention bestowed on the child while under active observation and treatment, and not to the operation itself. So far as my own experience goes, I am quite in accord with Bourneville in the view that medico-pedagogic, rather than surgical methods, offer the best chance for the amelioration of the mentally deficient child.

Personally I am acquainted with the progress of three craniectomised patients. The after-history of two is given on page 62 by my successor at the Royal Albert Asylum, Dr. Telford-Smith. I need, consequently, only now refer to them to say that one (N. L.), who underwent a series of operations by Prof. Victor Horsley, in 1891, and again in 1894, has unfortunately not fulfilled the favourable anticipations originally formed. With regard to a third case, the child of a medical man, craniectomised (at four stages) in 1891, the father reported as follows:—"I cannot say that he has been in any way benefited by the operation. The small amount of muscular strength he had prior to that time was diminished by the operation, and he has not yet, after three years, regained it. There has been some degree of mental improvement, but probably not more than would have come had there been no operation." It is only fair, however, to add that I should not be justified in asserting that the above cases are to be taken as average samples of the results obtained from craniectomy, and I am indebted to Mr. Victor Horsley for access to his notes of other cases which certainly show a more favourable result. The improved methods of operating which experience has suggested, especially the cautious removal of small portions of bone only at one sitting, have much reduced the mortality of the operation, which was at first considerable.

Dr. Allen Starr, in his admirable work on *Brain Surgery*, devotes a chapter to the consideration of "Trephining for Imbecility due to Microcephalus;" and he divides the latter into three clinical types. The first group contains cases of hemiplegia, with or without athetosis; the second, cases of mental defects of various grades; and the third, certain cases of sensory defects. This is no doubt an excellent division of cases appropriate for operative interference, but it seems to me that the hemiplegic cases do not necessarily fall into the category of *microcephalus*. My own view is

that the designation of microcephalus is properly limited to a very striking and quite characteristic type of idiocy. Whilst denoting smallness of head, it is not only in size, but also in form, that it is typical. Microcephalic cases have always a narrow receding forehead, a vertex tapering towards a point, and a flattened occiput. I do not limit the term microcephalus to a cranial circumference not exceeding 17 inches (as has been done by some), but when the measurement considerably exceeds this, and the form of the head is quite other than I have described, it is not right to designate the case as one of microcephalus. Trephining is no doubt often useful in relieving pressure resulting from inflammatory products within the cranium, but it seems to me improper to describe a case of this sort under the heading of "Microcephalus treated by linear Craniectomy."

The group, first adverted to, of cases of hemiplegia, with or without athetosis, is probably one promising better results from craniectomy than do those of pure microcephalus. Resulting as they frequently do in children from hæmorrhage during the process of parturition, compressing the motor centres, interfering not only with movement but with speech, and so giving rise to the semblance of idiocy (though the intelligence may in truth not be much impaired), there is no doubt that the early removal of a clot, or of adventitious tissue resulting therefrom, may relieve pressure symptoms and so produce a permanent amelioration, both physical and mental. In another Section, two cases of this kind under the care of Dr. Beevor and Mr. Horsley, in which the results were satisfactory, are to be described. Similarly in cases of traumatic or localised epilepsy there is undoubtedly encouragement to trephine, supposing that the underlying organic cortical changes have not proceeded too far. But in giving a prognosis the risk of subsequent irritation by cicatricial tissue must be borne in mind.

In hydrocephalus producing imbecility there is also a fair prospect of relief to pressure, and consequent improvement, by means of Keen's method of trephining followed by drainage. The following case, chronicled by Broca, in the *Revue de Chirurgie* for January, 1891, may be taken as typical. "A boy, four years of age, had suffered from hydrocephalus and was imbecile, and had contraction of the right arm following a series of convulsions. The trephining was done at the point indicated by Keen, three centimetres above and three centimetres behind the left auditory meatus. It

was noticed that there was no pulsation of the dura, or of the brain when this was exposed. Broca punctured the ventricle with a trocar and canula, and evacuated 60 grammes of fluid; he introduced a drainage tube through the canula and allowed it to drain into gauze dressings which were changed every day or two. Pulsation returned in the brain after the operation. On the sixteenth day a very marked improvement was noticed in the child, the contracture in the right arm having disappeared. The amount of fluid drained away became progressively less, and on the fifteenth day after the operation the wound had entirely healed, and the child was discharged from the hospital very much better, physically and mentally."*

In the class of mental defect depending upon hypertrophy of brain with pressure symptoms, similar good results may be anticipated from operation, the hypertrophied brain being in this case compressed by its dural and osseous investments.

In the "Lancet" of July 27, 1895, there is an interesting report of a case of Jacksonian Epilepsy with Aphasia, intellectual impairment and partial hemiplegia, dependent upon inherited syphilis in a boy of 13, treated by trephining at St. Thomas' Hospital, by Mr. W. Anderson. A circle of bone, $1\frac{1}{2}$ inch in diameter, was removed on the left side from over the convolution of Broca, and the lower parts of the precentral and second frontal gyri. The dura was incised, and the cerebral pulsations, at first indistinct, quickly resumed their normal character. Three months after the operation, the boy is reported to have remained free from fits and from paralytic symptoms, but his intelligence had not greatly improved with the exception of mental irritability having been relieved. Mr. Anderson, in his remarks upon the case, observes that "It still remains to be seen whether a second operation over the precentral and frontal gyri may not be advisable with a view to influence further the still defective intellectual functions." My own impression, from what I have seen at the autopsies of imbeciles tainted with hereditary syphilis, is that brain atrophy being dependent upon thickened membranes and diminution of blood supply owing to endoarteritis, it is, *a priori*, unlikely that much permanent benefit will result from operative procedures in this class of cases.

From summing up the evidence, I think we may conclude—

* Starr's "Brain Surgery," p. 262.

I. That craniectomy is but rarely (if ever) of permanent benefit in cases of ordinary congenital microcephalus, in which the original defect is in the brain, not in the bone; but that it may possibly do good, by relieving pressure symptoms and favouring brain development where premature synostosis is the result of osseous hypertrophy from constitutional causes. The diagnosis of appropriate cases is, however, beset with difficulties.

II. In recent traumatic cases, where epileptic or irritative symptoms arise from pressure, cranial operations are clearly indicated, as also they are in cases of mental impairment with hemiplegia or athetosis occurring from intra-cranial hæmorrhage during parturition—the “birth-palsies” of Dr. Gowers. The risk, however, of the cerebral defect arising from porencephalus, and not from compression by clot or false membrane, must be borne in mind.

III. In cases of mental impairment from effusion in hydrocephalus and in tubercular meningitis, tapping may be resorted to with advantage. In hypertrophy of the brain, also, trephining and section of dura mater may be beneficial in relieving undue pressure.

IV. Mr. Anderson's case (above referred to) gives expectation of, at any rate, temporary benefit by similar proceedings in cases of imbecility from inherited syphilis.

In this paper I refrain from reference to operative methods which of late years have been constantly improving in the province of cranial surgery. Whether in the future it may be found possible to release convolutions bound down by inflammatory products and thickened membranes, so that consequent atrophy and lack of cerebral development may be modified, is a question of surgical skill and technique, upon which I am incompetent to enter; but in these days one is disposed to think that almost anything is possible to the enterprise of the surgeon.

TIGHT GUTTERS