TRANSORBITAL LEUCOTOMY.

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THE operation of transorbital leucotomy recently described in the *Lancet* by Freeman (1948) was originally devised and carried out by Fiamberti in 1937 very soon after Moniz had introduced the original operation of leucotomy. Meyer, Beck and McLardy (1947) have shown that degeneration of the central portion of the pars parvicellularis of the dorso-medial nucleus of the thalamus was correlated with a lesion involving areas 9, 10 and 46 in the middle frontal gyrus. The transorbital method might now be said to follow almost logically on the work being done at the Columbia Presbyterian Medical Center and at the Greystone State Hospital, New Jersey, by a team of 96 (!) collaborators. Brodmann areas 9 and 10 and in some cases part of area 46 of the cerebral cortex are removed by an open bone-flap operation. This work is still in its infancy, and is not yet published apart from a summary by Nolan Lewis (1948). The entire project is to be described in a volume, *The Human Frontal Lobe*, to be published at an early date.

Heath and Pool (1948) reported bilateral resection of areas 9 and 10 in four cases using pentothal and then nitrous-oxide oxygen. The operation averaged five and a half hours, compared with the fifteen minutes or less (even 7·5 minutes !) required by the ordinary leucotomy. No complications developed, and there was no post-operative period of apathy or retardation so often seen after leucotomy. Two of the four cases made a social recovery.

Freeman found that there was less disturbance of the personality after transorbital leucotomy ; there was only occasionally the indolence and tactlessness found after leucotomy. (The post-operative disturbance is not nearly so severe as after leucotomy, and in the case of female patients the fact that the head has not to be shaved at all is a great advantage.) In some cases there was a period of elation followed by a return of symptoms and then a slower and steadier improvement. He also thinks that transorbital leucotomy renders patients more responsive to electro-shock therapy. The most striking change he noticed was an increased friendliness and sociability, due to the removal of emotional tensions. Fixed delusions and hallucinations are rather resistant to treatment, and motor compulsion and tics are little affected.

Severe emotional dilapidation is the most outstanding contra-indication to the operation, with schizophrenic psychoses of long-standing next in importance. The obvious conclusion from the success of removing areas 9 and 10 is to try

and undercut these areas, and so do without the lengthy operation of more than five hours. Fig. 1 shows the area of cerebral cortex removed, and Fig. 2 the position of the cut made by transorbital leucotomy underneath these areas,

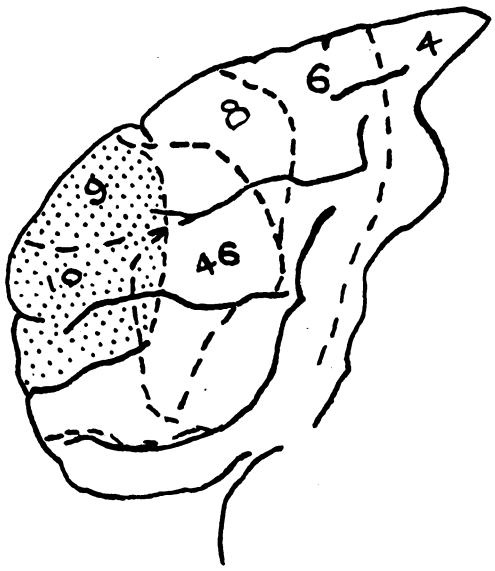

FIG. 1.—Showing area of cortex removed by topectomy.

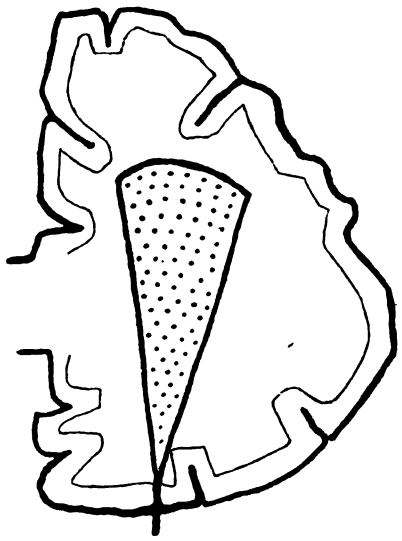

FIG. 2.—Showing area destroyed by transorbital leucotomy.

and so severing many of the fibres running to the median nucleus of the thalamus.

Freeman found, after operating on more than 100 cases by the transorbital method, that the results were much the same as after the better known opera-

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tion of prefrontal leucotomy. He found a rapid recovery in a number of cases which had not responded to intensive electric-shock treatment and other more conservative measures. So far his mortality-rate has been *nil*, as against an average mortality in leucotomy of about 3 per cent. He does not give any figures as to the occurrence of epileptic fits after the operation. The neurosurgeon purist will no doubt expect a higher rate of epilepsy after an instrument has been driven through the orbital plate, with the consequent risk of spicules of bone being raised and of small adhesions forming between the dura mater and the cerebral cortex. The risk of infection would appear to be small. Freeman does not report any cases, and in our small series we have met none. All cases as a prophylactic are given sulphadiazine 4 grm. in four separate doses before the operation and again after it.

		Age.	Duration of illness.	Date of leucotomy.	
E. M. P—	Depression	57	2 years	5.x.48	Improved.
D. M--	,,	55	4 ,,	28.x.48	Recovered.
M. W. G—	,,	62	6 ,,	13.x.48	Improved
E. A. C—	,,	75	1 year	13.x.48	,,
F. A. W—	,,	73	4 years	17.viii.48	,,
H. G—	Paranoid schizophrenia	47	1 year	31.viii.48	Recovered.
R. M. H—	Ditto	43	6 years	22.vii.48	Improved.
A. L. W—	Catatonic	33	4 ,,	22.vii.48	Worse

The technique followed in our eight cases was personally demonstrated and has been published by W. Freeman (1948).

Where possible, the position of the leucotome inserted to its final depth of 7 cm. has been checked by lateral X-rays before extraction of the instrument, and this has been found to correspond with the line of the coronal suture, though constant alignment needs some practice. Some varying degrees of resistance have been encountered in piercing the bony roof of the orbit. It was likely in at least one case that the outer angle of a large frontal sinus was penetrated, and this has been demonstrated in practice on a cadaver. The hazard of infection is obvious, and although no such complication has been recorded, it is considered advisable to have a preliminary X-ray to exclude active nasal sinusitis. It has been found extremely difficult to avoid contamination of the leucotome by the lid margins. These may be protected by a self-retaining eyelid retractor. (Pre- and post-operative sulphonamide has been adopted as a prophylactic measure.)

The danger of serious damage to intracranial blood-vessels with this "blind" operation appears to be small, as the orbital surface of the frontal lobe is relatively avascular. However, intravenous pentothal anaesthesia was used in place of electroconvulsive shocks in two cases with vascular hypertension, because of the increased risk to cerebral vessels with post-convulsive congestion. Freeman comments on the possibility of damaging deep vessels if the leucotome is moved too far—a risk also present and doubtless greater, of course, with major leucotomy.

Conclusions.

Of the 8 cases, 2 have recovered completely and very quickly, 4 of the depressed patients are very much better, 1 schizophrenic of long standing is much improved and the other appears to be worse.

All of these cases were of bad prognosis, and 7 out of the 8 have shown improvement varying from apparent recovery to distinct improvement.

From a surgical point of view 2 could not have been operated on by ordinary leucotomy without great risk.

The cases described as improved have shown great improvement, but are not yet considered well enough to go home.

Cases.

E. M. P—, aged 57, widow, housewife. Had been depressed for some time. E.C.T. as an out-patient early in 1947, and subsequently admitted in December for some more. After a further 12 fits she was allowed to go home for domestic reasons. She slowly lost ground again, and was seen and the question of a leucotomy discussed with her. She agreed to have it done, and came into hospital on 2.x.48. There was nothing abnormal physically; blood pressure 136/86. She was very depressed, worried, and said she regarded leucotomy as her only hope.

5.x.48: Transorbital leucotomy under E.C.T. She developed a marked tachycardia afterwards, but otherwise her post-operative course was uneventful. After three days said she felt perfectly well and ready to go home and do her housework. At times a little emotional and inclined to cry.

D. M—, female, aged 55, single, housekeeper; one of nine children; one brother died in Winson Green Mental Hospital in 1924. Described as hysterical and stubborn. Lived with and looked after a very domineering old mother from the age of 25 until she was 51. She then became depressed and complained of noises in her head and insomnia; became untidy when she had previously been very tidy. During the past four years has had E.C.T. always with extreme cyanosis. Whilst at home she has made three attempts at suicide with sleeping tablets, and before admission 9.iii.48 was found unconscious again, having taken an overdose of sleeping tablets. Slowly inproved, but began to relapse and become depressed, continually talking about the unhappy years she spent with her mother.

On 28.x.48 transorbital leucotomy under E.C.T. Post-operative course uneventful. Showed considerable confusion for first few days—wanted to "let air out of her hot water bottle" and succeeded in flooding her bed. Improved very quickly after this and became cheerful and bright, saying that she had not felt so well for years and that life at last was a pleasure.

M. W. G—, aged 62, single, physiotherapist; one of seven children. An aunt had "bouts of depression." Was always highly strung and suffered from migraine. Gave up work in 1929 as too exhausting. Had a nervous breakdown in 1945, was depressed and could not sleep. During next three years had treatment in several nursing homes and hospitals, including courses of E.C.T. on two occasions. Condition varied, but little progress, and was admitted to Barnwood House 20.ix.48 for leucotomy. On admission there was little to be found abnormal on physical examination, except a blood pressure of 220/130, which would ordinarily rule out any question of leucotomy as much too dangerous. The patient was depressed and agitated, complained of great loss of power of concentration and inability to think. Continually picking her face.

13.x.48: Transorbital leucotomy under pentothal anaesthesia. No post-operative complications. Still depressed and agitated and still picking her face. Had to be catheterized on three or four occasions during the ensuing fortnight. The systolic blood pressure came down to 150 on 6.xi.48. Became wet and remained so until 23.xi.48. Has continued to improve steadily, gaining weight, and has reached the stage of "going to dances."

E. A. C—, female, aged 75, widow; no family history of insanity. Had always been of a depressive type, and for past few months had shown depressive symptoms—querulous and fault finding, agitated, asked if someone could give her a dose of poison.

30.ix.48: Admitted to Barnwood House. On examination showed no physical abnormality except very severe arterio-sclerosis and a blood-pressure of 196/96. Says life is quite hopeless and that she cannot recover; is depressed and agitated, and wants to be poisoned. Again not a case for ordinary leucotomy.

13.x.48: Transorbital leucotomy under pentothal anaesthesia. Returned from Bristol in a cheerful mood and with no discomfort. Was confused for a few days, but no incontinence. When the confusion disappeared was still rather depressed but not agitated, and smiled when asked about having some poison. Took an intelligent interest in things going on around her, and quite astonished her relatives when they came to see her. Discharged.

F. A. W—, female, aged 73, widow; no family history. Had been confused for some time; wandering round her house saying "Oh!" at frequent intervals, unable to answer questions or give a connected account of herself. She was admitted to Barnwood House as a temporary patient 14.vii.45. She made no progress and was certified on 25.x.45 as she was deemed to have regained volition, but was still very depressed and agitated. She remained in this depressed state. Her physical condition was not good; she had a considerable degree of arterio-sclerosis, but her blood-pressure was only 112/76.

17.viii.48: Transorbital leucotomy under pentothal anaesthesia. Post-operative course uneventful. Was somewhat confused for two or three days, but very much more cheerful and less agitated. She then became more depressed for a while, but this slowly disappeared.

H. G—, female, aged 47; single, manageress in big store; one of five children. A brother stated to have a "nervous disorder." Has always been introspective, and was regarded by the rest of the family as the "odd" member. No interests outside her work. Was "engaged" at 24, but fiancé proved to be married; this made her very bitter. Had a previous nervous breakdown in 1938–39 and was treated by her family doctor at home. Menstruation always difficult and ceased at 46. Six months before admission had a skin affection of her feet, which was treated by a competent dermatologist; she insisted it was syphilitic. Was vague in conversation and brooding—had ideas of persecution and said that she was trapped. This slowly progressed. She said that wireless was used to read her thoughts, that her employers were trying to spy on her and dismiss her (not true). She looked old, worn and morose. She was untidy and careless in appearance and habits. Became difficult to deal with, then said she wanted to die—that there was nothing left to live for. Was deemed suicidal and was admitted as a voluntary patient. On admission she was found to be hallucinated, but otherwise would not say much about her illness. Thought the other patients were in telegraphic communication with her; one day said she had been cut in half. Became very depressed and wandered out of the garden, so it was decided to perform a leucotomy on her.

31.viii.48: Blood pressure 160/100. Transorbital leucotomy performed after five successive electric fits. Her post-operative course was quite uneventful; she said she felt calm and contented, and was not worrying. She continued to improve, her hallucinations had gone and she became cheerful and friendly. On 18.ix.48 she left hospital and went to stay with relatives in London. Her family doctor expressed the opinion that he was amazed at the change in her.

On 1.xii.48 was seen and appeared to be happy and contented; in good physical health.

R. M. H—, female, aged 43, married. Paternal aunt said to have had a mental breakdown. Has always been of a worrying disposition, lacking in self-confidence and over-conscientious. Mental breakdown started in India in 1942. During the following five years had a variety of treatments in Ranchi European Mental Hospital—cardiazol, sulfosin, E.C.T., hydrotherapy, insulin coma with 52 comas, more E.C.T., clinestrol and secconal. Was a typical catatonic—mute, negativistic, had to be nasally fed, was violent, aggressively sexual in behaviour, masturbating fre-

quently; mechanical restraint had to be resorted to. Improved considerably after the insulin comas, but still restless and idle. Dirty in her habits. Flown to England in June, 1948, and certified.

25.vi.48: Admitted to Barnwood House. Resisted any attempt to examine her, but talked quite pleasantly to nurses and doctors. Was employed doing needlework, which she does very well and concentrates on quite well. Habits *not* dirty. Expression always puzzled and always "wanting to go over there." Cannot be persuaded that she is in England.

22.vii.48: Transorbital leucotomy after E.C.T. Post-operative course uneventful; no incontinence. For a few days she was brighter and wrote letters to her parents and sister, a thing she had not done for a long time. Doing needlework again, but still puzzled and somewhat unhappy at times. Subsequently continued to improve and has been allowed home for the day.

A. L. W—, female, aged 33, single; no family history. Previous to admission had had treatment in other mental hospitals. Admitted 17.xii.45; a typical schizophrenic, foolish in behaviour, laughing, grimacing and unable to sustain a connected conversation; volunteered the information that "she was not right in the head."

22.vii.48: Transorbital leucotomy after E.C.T. No post-operative complications; not faulty. Subsequent course rather stormy—became excitable and banged her head against wall, causing a large naematoma; removed to padded room. This excitable state continued for two months or more, and then slowly subsided.

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