SOCIAL ADJUSTMENT OF NEUROTIC PATIENTS AFTER PREFRONTAL LEUCOTOMY

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In this paper the results of a follow-up into the social adjustment of 30 neurotic patients treated by bilateral prefrontal leucotomy are discussed. The length of time since operation varies between eighteen months and eight years, the majority having been observed for three years or more. Many cases had a relatively unsettled period, usually for about six months, after operation, while others, apparently well on leaving hospital or for some months afterwards, have later shown defects in their adjustment. For this reason the early course after operation has been excluded from discussion, and the patients in this follow-up have all now arrived at a relatively stable social level.

These patients were all operated upon by the same surgeon, Mr. Wylie McKissock, whose technique has been described elsewhere (Fleming and McKissock, 1943), while the cut in all these cases was purposely made relatively more anterior than that usually used for psychotic cases.

No patients were included in this series if their illness had at any time shown psychotic features, while those cases which were diagnosed as psychotic depressions, whether endogenous or exogenous, have also been excluded.

All cases had been under observation for at least several months before operation and an assessment made by more than one psychiatrist, and only those in which there was agreement on the neurotic nature of the illness have been included.

The patients were followed up by out-patient consultations, often with the psychiatrist who originally treated the patient in hospital. They were also, for the purpose of this paper, interviewed at home, and their relatives and employers were visited, all by the same social worker. Some of the cases were under our own care, but most were under the care of colleagues. Of the neurotic patients passing through the hospital in the eight years concerned only one in 300 was leucotomized.

The type of neurotic patient who was selected for operation always showed the following features. (1) The previous personality had considerable drive, and, in particular, the patients had made an attempt to continue their way of life even with severe symptoms. (2) All the illnesses had marked tension as a presenting symptom. (3) No other treatment was thought likely to give relief; in practice, other methods of treatment had already been tried and had failed to give lasting relief. (4) All, at the time of operation, were considered to be incapable of living their lives outside hospital unless they had relief from their illness. Cases were rejected which had antisocial or overt aggressive tendencies in their histories, as were recurrent depressives with marked mood swings.

Although the diagnoses could be grouped under the headings of anxiety states, depressions, and obsessive-compulsive neuroses, in fact most cases had features of all these reaction types. For example, several patients had originally attended a psychiatrist for mild anxiety symptoms. A year or two later it was noted that some depression was also present. Later still, obsessional symptoms occurred, until by the time operation was considered the clinical picture showed all three components. All the cases of obsessional neurosis had well-marked depression secondary to their obsessional illness. It may be said that these patients are those whose nervous systems were able to develop and withstand marked mental tension over a long period, the average duration of illness in this series being eight years.

Literature

Most previous reports have been concerned with results of operation on psychotic patients. The Board of Control (1946) showed that obsessional neuroses made a relatively good recovery. Roughly 55% were "citizens" after operation, compared with 40% manic-depressives and 16% schizophrenics. Watts and Freeman (1944) reported on a series of obsessive tension states and recorded that 67% were afterwards leading useful lives. They considered that their patients showed no significant intellectual or emotional impairment, and that they made a better practical use of their intelligence after operation. The findings in the present series do not support these optimistic statements. On the other hand, the report of Ström-Olsen and Tow (1949) suggested that all of their group suffering from neurotic depression, obsessional states, and tense hypochondria suffered from some personality defect. These findings will appear pessimistic compared with the results of this inquiry, but perusal of their case histories suggests that their patients were probably more nearly psychotic than ours.

Partridge (1950) discusses the results in 24 cases of obsessional illness, but otherwise comparison is difficult because all his depressives are considered together and the majority were presumably psychotic. In general his results with obsessional illnesses are in agreement with those of the present series.

Results

In assessing the results, consideration has been given to the previous personality and level of adjustment, as some patients had always been handicapped by personality defects, while others had been normal citizens. Although the patient's own account of his stability and behaviour is of value, it has to be evaluated in the light of the relatives' and employers' statements. Lack of insight into the attitudes of others and lack of self-awareness after leucotomy lead the patients into errors of judgment of their own performance. For example, one obsessive-compulsive insisted that no change had occurred, although observation showed that her rituals now occupied half an hour instead of four hours. On the other hand, many patients state that they are fully recovered and have no complaints, while relatives will point out very clear defects in their behaviour.

As all patients were completely incapacitated at the time of operation and are now out of hospital and living at home; it is clear that some measure of improvement has occurred in all. It can be said that they now suffer less from their illness, and even if not well can be looked

after at home instead of in hospital. It is convenient to grade the results into four levels of social function.

Full Recovery

In the first group are those patients who have made a full recovery. This means that not only are they symptom-free but that after the operation there is no defect which hampers their lives.

A married woman aged 32 had no psychiatric illness in her family and her early life was happy and uneventful. She had been kept ignorant of sexual matters, and her first neurotic breakdown at 18 occurred after a man had exposed himself to her. At this time she had anxiety symptoms with phobias and some depression, from which she made a full recovery without specific treatment. A second breakdown with similar symptoms occurred at 21. This was probably the result of conflict over sexual activities. Convulsion treatment was given without benefit, but she recovered after about three years. She married when 26 and was very happy and had two children. The third breakdown was precipitated by the overseas posting of her husband, who was in the Army. She was admitted as a voluntary patient to another hospital for six months, received E.C.T., which did not relieve her, and returned home. She was readmitted later, but further E.C.T. and the return home of her husband did not effect a recovery. She was eventually admitted to Belmont. She complained of feeling depressed and anxious, and was depersonalized. She was not retarded nor self-accusatory; her appetite was poor and her sleep fitful. She ruminated over thoughts of suicide and insanity in an obsessional manner. The symptoms had become progressively more severe over three years.

Three years after her leucotomy she was symptom-free and stated that she was glad to be alive. She was managing a teashop and guest house, and her marriage was happy even though her husband, still in the Army, was at the time posted away from home. She had plenty of friends, and her social activities included regular card-playing, swimming, and tennis. Whereas before her illness she had been dependent on others, particularly her husband, she was now quite self-reliant. Her mood was stable, she was tactful with customers and staff, and her social adjustment was entirely satisfactory.

Much Improved

The second group comprises those patients who, although very much improved and leading useful lives in the community, have either some persistent symptoms or defects following operation which prevent full enjoyment of life or full participation in it.

A single man aged 30 had a family history of neurotic illness. He himself had always had neurotic traits and a bad work history, with many changes of job and spells of unemployment. He had always felt inferior, was shy, and was unable to mix freely with either sex. Since the age of 21 he had suffered from attacks of anxiety with trembling, giddiness, and nausea. When 22 he was conscripted, but was soon discharged because of his neurosis. He attended a psychiatric out-patient department and received some psychotherapy. He later became engaged, but decided not to marry because of his illness. He was admitted to hospital when 30, when he was noted to be anxious and depressed, with obsessional thoughts of death and occasional feelings of unreality. He stated that he was desperate, and willing to undergo any treatment for relief. E.C.T. increased his anxiety, but abreactive treatment gave temporary relief. After he had made an abortive suicidal attempt leucotomy was decided on. Four years later he was happily married and was said to be very affectionate towards his wife. Since discharge from hospital he had had regular employment for the first time in his life. He was still very shy in company, however, and this limited their social activities. Also, in the home he lacked initiative and left decisions to his wife. She considered he was very much improved by his leucotomy and was quite content with her marriage.

Improved but Seriously Handicapped

The third group consists of those patients who, although improved and usefully occupied in the community, are seriously handicapped by defects.

A married woman aged 67, the oldest patient in the series, had suffered from obsessional ruminations about death and disease since the age of 23. She had a well-marked obsessional personality, and even in her periods of relative freedom from obsessions her rigid outlook hampered her enjoyment of life. Before her admission for leucotomy she had had one previous period in hospital and considerable out-patient treatment. She was well preserved physically, apart from a mild hypertension, and there was no evidence of senile mental deterioration. Because of her obsessional doubts she was depressed and agitated.

Three years after her leucotomy her obsessions, agitation, and depression had left her completely. She seemed quite happy and contented. Inquiry of relatives, however, elicited the fact that incontinence of urine, which began after operation, still persisted, that she had a marked inertia and no interest in any social life, and that "all depth had gone out of her." Although still doing the housework, she showed no interest or enthusiasm for it, and would often just sit in a chair and leave work to accumulate. Her statement, "Before the operation I was very worried about my son and his fiancée—now I don't seem to care who he marries," is an example of her changed attitude.

It seems reasonable to suggest that the elderly patient may be unable to recover from the lesions produced by the operation because of organic restrictions such as arteriosclerotic changes, and because of the rigidity of personality usual in the elderly.

Social Burden

In the fourth group are those patients who, although perhaps less difficult to nurse and more easily tolerated in a home, yet remain a burden to the community.

A spinster aged 24 was an only child. Her mother had a history of emotional instability but no overt breakdown. As a child the patient had several neurotic symptoms. She was a good scholar but always shy, had a quick temper, and since the age of 10 had developed increasingly marked obsessional traits. She had left three jobs because of neurotic symptoms. When 10 years old she began worrying over being fat, and on starting work was slow and always afraid she would do something wrong. From the age of 24 her symptoms had increased, the most severe of them being obsessional doubts. During the year before entering Belmont she had received considerable out-patient psychotherapy and E.C.T. twenty times. On admission she was noted to have marked obsessional ruminations, little depression but considerable anxiety, with palpitation and sweating.

This patient appeared to improve considerably after operation, and follow-up a year later found her at work again and with few symptoms. Five years later, however, she was unemployable, a recluse at home. She had spells of depression and took "herbal treatment." She occupied herself reading or listening to the wireless. Her symptoms were not as bad as before operation; but to her slowness, as a result of her obsession, was added an inertia presumably the result of operation. She was also irritable with her parents, who found her difficult to live with apart from having to support her. Possibly as a result her father was inclined to be "out a great deal on business." She seemed resigned to not feeling well.

The early history of this patient revealed schizoid personality traits; she lacked the warmth and depth of feeling present in the patients who made a good recovery. Another of this "social burden" group also had schizoid traits, and both are now living a restricted life at home. Schizoid traits are thus of bad prognostic significance, as they may be accentuated after operation. It may be

that the relief of tension in those patients with schizoid traits removes the anxious drive and leaves the patient more detached, apathetic, and inert.

The clinical description of the illness and the results obtained are shown in Table I.

TABLE I

	No.	Full Recovery	Much Improved	Improved but Seriously Handicapped	Social Burden
Neurotic depressions	10	3	—	6	1
Obsessional states:					
Largely ruminative	7	3	3	—	1
Largely compulsive	7	2	3	1	1
Anxiety states	6	2	3	1	—
Total	30	10	9	8	3

Only seven cases have been followed up for less than three years; two of them are social burdens and two are seriously handicapped. The figures are too small to be significant, and, although they suggest that there is a tendency towards improvement with the passage of time, it is possible that in the last four years less suitable cases have been accepted for operation.

The sex ratio and marital state in this group are given in Table II.

TABLE II

	No.	Full Recovery	Much Improved	Improved but Seriously Handicapped	Social Burden
Male	9	2	3	2	2
Female	21	8	6	6	1
Married	16 (+5)	6 (+2)	5 (+3)	5	—

Figures in brackets indicate the number who have married since the operation.

It is apparent that the men were not so successful in readjusting as the women, but the figures, of course, are small. Married patients made a relatively good adjustment. This probably affects the social factor in recovery: a married woman returns to an environment where she is "at home"; a single man has again to find work and perhaps a mate.

Previous treatment included E.C.T. in 22 cases, insulin coma in 5, modified insulin in 10, deep narcosis in 8, abreactive technique in 7, and psychotherapy (of at least three months' duration) in 7.

The results of the treatments were assessed and compared with the result of leucotomy, but were not found to be prognostically significant in any way. This is contrary to the views and findings of others. The analysis of the duration of illness before operation revealed no evidence that this had any influence on the result: neurotics appear to differ from psychotics in this respect.

The influence of the presence of neurotic traits in the personality before illness and of a family history of mental disorder is shown in Table III.

TABLE III

	No.	Full Recovery	Much Improved	Improved but Seriously Handicapped	Social Burden
Previous personality free of neurotic traits	9	3	2	3	1
No family history of psychiatric illness	9	3	2	2	2

Again the numbers are small, but it is interesting that most of those who made a full recovery had neurotic traits and a family history of mental illness, while among those who became social burdens or made a poor recovery were patients who had a normal family and previous personality. The possible significance of this is discussed below.

The influence of age on prognosis is suggested by Table IV.

TABLE IV

	Full Recovery	Much Improved	Improved but Seriously Handicapped	Social Burden
No. of cases	10	9	8	3
Average age	41.4 years	35.2 years	36.4 years	26.3 years

The five patients under 26 are in the third or fourth category, and of the three patients over 50, one made a full recovery and the other two are improved but with serious social defects. Thus the best results occurred in the middle-aged.

The practical efficiency of the patient either at work or in the domestic sphere was analysed (Table V). It should

TABLE V

	Improved	Static	Worse
Work status (men and single women)	4	2	7
Domestic efficiency (married women or single girls caring for patients)	4	4	3

be remembered that the comparisons are with the patient's best previous achievement.

The remaining six patients were married women who not only ran a home efficiently but also went out to work. They had all done this before, and their efficiency was essentially unchanged.

Of those male patients whose work had improved, one has the same job but has been given a rise of pay, which he considers is evidence of his increased efficiency, another (a clerical worker) is now in charge of a new department and has increased his prospects of further promotion. The other two are in regular employment of a semi-skilled nature which previously they had been unable to do. Some patients are now able to accept responsibility of which they were previously afraid.

Where the work status has deteriorated the common factor seems to be that the patient now lacks self-criticism and ambition, so that he tolerates a low standard of production, does not look for a better job, and has no desire for responsibility.

Personality Changes

This series of patients reveals contrasting changes in personality. Previous reports have suggested that a "leucotomy syndrome" of personality change can be found, often socially undesirable in that apathy, carelessness, and lack of regard for convention form part of it. Other writers have suggested that there is usually a change for the better: their patients are described as more sociable, having a greater self-confidence and a more practical approach to life. This follow-up has revealed no constant pattern of change either of improvement or of deterioration. For any change in personality one observes in one patient, the opposite can be found in another. For example, some patients are more

friendly and sociable, others more retiring; some are more garrulous, others quieter; some are more happy-go-lucky, others more careful and persistent. What is more, both kinds of personality changes can occur with benefit to the patients concerned, depending on their social milieu. For example, a more care-free attitude towards work may develop in an obsessional patient with benefit to his actual performance, while an anxious patient previously careless at work because of his emotional state may become a more careful and persistent worker after leucotomy. In the case of one patient whose tensions often provoked quarrels at home, the reduction of tension and subsequent calmer behaviour were welcomed by all the relatives. On the other hand, a previously restrained and timid woman who had broken down under the stress of a psychopathic family became much more quick-tempered and outspoken than before and kept her family in order, again to their admitted benefit. The personality changes that follow leucotomy depend on the previous personality and which aspects of behaviour have been either promoted or inhibited by the tensions, fears, or anxiety of the patient.

Social Defects

These were present in 20 patients, most occurring only in two or three.

Lethargy of sufficient degree to be a social handicap was still present in a third of the patients. It was noted as leading to late rising and early bedtime habits, and an inability to keep up with more active friends, or to plan and execute entertainment at home. The lethargy seemed most marked in initiating activities, as, once started, the leucotomized patient seemed able to maintain a good performance.

Irritability.—One-fifth of the patients were irritable, but no actual violence has been recorded. The impression is gained that irritability becomes less the longer the time since operation; thus it may be an irritative phenomenon as suggested by other writers.

Outspokenness and Volubility.—These are listed together because they often occur together. They do not necessarily occur in patients with irritability; for example, one placid and friendly young woman found that she tended to express her opinion of people quite freely "before I had time to check it." Volubility is often pronounced, the patient pouring forth a stream of conversation which, although coherent, can nevertheless be very trying to the audience. Fortunately such patients do not seem to mind being interrupted.

Less Sociable.—Several patients were less sociable; this trait was so marked in some cases that the whole social life of their family was handicapped. Decrease in sociability occurred in those patients who had previously been sociable in order to fulfil their sense of duty, or whose tensions had driven them out to try to find distraction from their inner fears.

Lack of Feeling for Others.—This was not complained of by the patients but by their relatives. In the three cases in which this was noted the relatives had felt that the good will and coherence of the family were affected by it. As one complained, "She just goes her own way now."

Easily Satisfied and Lack of Ambition.—These two defects were found together. They were obviously more noticeable in male patients for the reason that this particular attitude is prejudicial to success at work. Typical comments were, "He doesn't mind just doing the same job though it's boy's work really"; "He is quite happy as a workman—doesn't try to get a more responsible job"; or, "He doesn't seem to care if he does make mistakes at work now—he's lucky to have an understanding boss." Carelessness at work or in the home also comes from this easily satisfied attitude.

Social Gains

Sixteen patients recorded material improvement in their personality in 'one sphere or another. Some patients, of course, had improvement in one sphere, defects in another. The improvement was usually the result of the decline in emotional tension which in some way had previously handicapped the patient. It will be noted that several of the improvements are the reverse of the defects previously described—which makes it difficult to accept the "post-leucotomy syndrome" as a single entity. The main social gains are:

Increased Sociability.—Patients found they were less tense in social gatherings and therefore could enjoy company previously shunned. Several compulsive obsessives no longer needed to perform an extensive ritual after meeting people, so that a social life once more became possible. Two patients with anxiety states found themselves able to mix freely without embarrassment for the first time in their lives. In some cases this sociability was of a superficial nature, but in others real gains have occurred.

Self-confidence.—This affects social ease, but is also noted in patients who now rely on their own judgment instead of on others, or who are now active participants in family life rather than parasites on the energies of others.

More Lively.—This again contradicts the idea of universal post-leucotomy apathy. It was noted most in previously shy and inhibited patients (but not schizoid), who now became more active members of their social group. A similar improvement also occurred in some of the ruminating obsessional patients.

More "Practical".—Freeman and Watts considered that the leucotomized patient made a better practical use of his intelligence. This was recorded in only three of the patients in this series, all of them housewives.

Married.—Five patients—one man and four women—have married since operation. In all cases this reflects a real improvement in adaptation to the opposite sex, as all the marriages seem to be successful, although one is under considerable stress owing to the husband's Army service.

It is worth noting that no instance of promiscuity has been recorded since leucotomy, even in cases in which it was present before.

Discussion

The number of patients in this series is too small for the results to be considered more than suggestive. However, compared with other series, it is apparent that patients with neurotic illness respond well to leucotomy. None can be considered worse, while in roughly two-thirds of the cases a severe and crippling illness has been strikingly relieved and the patient enabled to fulfil the role of a useful citizen once more.

Of the diagnostic categories the depressive illnesses have been the least successful. As most neurotic illnesses present a mixture of symptoms, it is possible that this only means that a personality with less underlying drive will present more as a depression than as an anxiety state.

In this series the younger patients made the worst adjustment, irrespective of previous diagnosis. No patient of 25 or under made a good recovery. The best results were achieved in patients aged 30 to 50. It was noted that most had come from unstable families and had experienced lifelong neurotic traits. It is suggested that the neurotic patient who makes a good recovery after leucotomy is often the one who has carried on his or her life in spite of personality difficulties and has broken down in middle age only after repeated stresses. The younger patients who broke down under

the stress of adolescence or early adult life lacked the stamina to make a good adjustment after operation.

Another conclusion is that neurotic patients do not necessarily show the so-called post-leucotomy syndrome. Some are more lively, others more apathetic; some more careful, others careless; some irritable, others calmer. Moreover, these varying traits occur in patients with both good and poor results, and can be evaluated only against the past and present personality and social background. It is possible that the serious personality defects described following operation will be separable into those due to persistence of previous personality defects or disease symptoms, and those due to the cut being made too far posteriorly or in other anatomically undesirable areas.

Summary

A follow-up was made of 30 neurotic patients who had been treated by prefrontal leucotomy. Two-thirds were found socially well adjusted or with minor defects only. The factors on which the result depends are assessed and discussed.

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SIMPLE GASTRIC ULCER AND CARCINOMA

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The possibility that a chronic gastric ulcer may become malignant has excited controversy for more than a century. In the early years of gastric surgery it was commonly believed that a large proportion of gastric carcinomata had their origin in chronic simple ulcers. For example, Wilson and MacCarty (1909) concluded that 71% arose in this manner, and, in this country, Moynihan (1906) stated that about 60% of cases of gastric carcinoma gave a history suggesting previous simple ulcer.

A more moderate school still holds the view that malignant transformation of simple ulcer may occur, but far less commonly. Ewing (1918) concluded that not more than 5% of simple ulcers undergo malignant change, and similar views have been put forward by Dible (1924), Cabot and Adie (1925), Stewart (1929, 1931), and Newcomb (1932). This school bases its opinion largely on the results of pathological studies of post-mortem material and specimens removed at operation.

By contrast, Brown (1930) studied the fate of 1,130 patients in whom there was good evidence of chronic gastric or duodenal ulcer and who were treated medically. In the 77 cases of chronic gastric ulcer only one subsequently developed a gastric carcinoma, and that at a different site from the ulcer. Of the remaining 1,053

patients with duodenal or combined duodenal and gastric ulcer, nine subsequently developed gastric carcinoma. He therefore concluded that chronic gastric ulcer is not a predisposing cause of carcinoma.

The problem is of considerable practical importance because the treatment of gastric ulcer must depend upon which view is held. In making a survey of 375 patients treated in the Radcliffe Infirmary for gastric carcinoma, we were interested to find 26 patients in whom there was some evidence that the neoplasm might have originated in a chronic gastric ulcer. It is our purpose to present the evidence derived from these cases and to discuss it.

Results

In Table III we have set out the salient features of all the cases in which there was evidence that the carcinoma might have arisen from a chronic gastric ulcer. In the final column we summarize the evidence which seems to support this view.

All the cases except two had pathological evidence in favour of their being "ulcer-cancers." We are not competent to judge whether the criteria adopted by the pathologists were adequate to permit of such a diagnosis. The fact that well-trained pathologists came to this conclusion indicates to our satisfaction that the lesions presented the characteristics of peptic ulceration in almost all cases.

If we consider other features of the group of cases, some interesting facts emerge. Only 13 of the patients had clinical histories which we can accept as probably indicating the presence of a chronic ulcer. The site of the carcinoma is also of interest. Of the 26 cases no fewer than 18 were pre-pyloric, the remaining 8 being in the body of the stomach (Table I). This distribution corresponds with what we have found for the site of carcinoma in the whole series of 375 patients, of whom the present group is a sample. It contrasts sharply with the well-known predilection for the body of the stomach shown by chronic gastric ulcer.

TABLE I.—*Site of Carcinoma in Relation to Clinical History of Chronic Gastric Ulcer*

Clinical History of Chronic Gastric Ulcer	Site of Carcinoma		
	Pre-pyloric	Body Other Than Lesser Curve	Lesser Curve
Positive	7*	3	3
Negative	11†	0	2
Total	18	3	5

* Two had separate gastric ulcers on lesser curve.

† One had separate gastric ulcer on lesser curve.

Among the 18 patients with pre-pyloric carcinomata 3 had chronic gastric ulcers on the lesser curve which were separate from them.

It is also of interest to observe the results of the fractional test meal in the 21 patients of this group in whom it was carried out and to compare the results with

TABLE II.—*Fractional Test Meal Findings*

	No. of Patients	Normal or Hyperacid	%
Present group	21	12	57.1
Remainder of parent series ..	162	36	22.2

remaining cases of the parent series (Table II). The present groups showed a much higher proportion of patients with normal or increased free hydrochloric acid.