THE VALUE OF LEUCOTOMY IN RELATION TO DIAGNOSIS

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In an earlier paper (Robin, 1958) the results of leucotomy were assessed by comparing a treatment group of leucotomized patients and a control group, matched for sex, age on admission, and length of admission. Apart from noting the similarity in the distribution of diagnosis in the two groups, no cognizance was taken of diagnosis when the operation was assessed. In this paper the case material has been extracted in relation to diagnosis only. For example, all cases of schizophrenia have been taken out of the series and then divided into two groups, (1) patients treated with leucotomy and (2) non-leucotomized subjects. The groups were not then composed of matched pairs or of equal numbers. They are nevertheless shown to be comparable in other respects than diagnosis alone.

Schizophrenia

Ninety-one cases of schizophrenia were found to have been treated by leucotomy and 97 cases were not so treated. The findings are set out in Table I. These two groups were comparable in their sex and age distributions and in their periods of stay in hospital to their operation dates. (Each non-

leucotomized patient retained the "operation date" originally allocated to him or her.) The results in the two groups, when discharge from Runwell alone is considered, suggest that leucotomy offers at least some initial advantage. While the distribution of the tables as a whole is not quite significant at the 0.05 level, the single line concerning discharge does show a statistically significant difference favouring leucotomy. The favourable discharge rate, however, is temporary. The number of readmissions to Runwell and other hospitals is greater in the leucotomy group, and by the time of the final survey (December 31, 1955), the number of discharged patients is comparable in the two groups. The total period spent in Runwell and in all mental hospitals after operation date shows no difference between the treated and untreated groups. Fig. 1 shows the similarity in the results on the two groups one to ten years after operation date.

Patients discharged and not readmitted to any mental hospital (under the same name) are those already designated "recovered" and are dealt with in more detail. The work and symptom status of the two groups is not dissimilar. The age distribution,

FIG. 1.—Ninety-one cases of schizophrenia subjected to leucotomy compared with 91 controls suffering from schizophrenia one to 10 years after operation.

TABLE I
RESULTS IN SCHIZOPHRENIA

	Leucotomies	Controls
Sex Distribution		
Male	20	24
Female	71	73
Total	91	97
Age of Admission		
-20	8	4
-30	44	41
-40	28	35
-50	9	14
-60	2	3
+60	0	0

Length of Admission to Operation Date*		
- 1 mth.	8	3
- 3 mth.	2	2
- 6 mth.	3	6
- 1 yr.	7	9
- 2 yr.	13	12
- 3 yr.	10	10
- 4 yr.	7	6
- 5 yr.	5	7
- 10 yr.	31	36
+ 10 yr.	5	6

(n = 1, $X^2 = 0.14$, p = 0.7)

*In the original matching (Robin, 1958) each control was allocated the operation date of its matched leucotomy subject. These dates have been adhered to here.

End-result		
Never discharged*	53 (59%)	72 (74%)
Discharged at some time	33 (37%)	20 (20%)†
Transferred	5	5

(n = 2, $X^2 = 5.738$, p = > 0.05)

*Died in hospital on first admission	4	7
†(n = 1, $X^2 = 4.4$, p = < 0.05)		

Discharge		
Discharged at some time	33	20
Since readmitted to Runwell Hospital	13	6
Never readmitted to Runwell Hospital	20 (22%)	14 (14%)
Readmitted to other hospitals (excluding transfers)	6	4
Not readmitted to mental hospital since discharge	14 (15%)	10 (10%)

Period in Runwell Hospital since Operation		
- 1 mth.	5	3
- 3 mth.	5	2
- 6 mth.	3	7
- 1 yr.	4	7
- 2 yr.	6	4
- 3 yr.	5	6
- 4 yr.	6	7
- 5 yr.	6	10
- 10 yr.	25	18
+ 10 yr.	26	37

Period in All Mental Hospitals since Operation		
- 1 mth.	2	3
- 3 mth.	2	2
- 6 mth.	2	2
- 1 yr.	5	2
- 2 yr.	5	7
- 3 yr.	4	5
- 4 yr.	6	7
- 5 yr.	7	11
- 10 yr.	29	19
+ 10 yr.	29	39

	Leucotomies	Controls
Period since Discharge in "Recovered" Patients		
- 1 yr.	2*	1*
- 2 yr.	1†	0
- 3 yr.	3	0
- 4 yr.	1	1
- 5 yr.	3	0
- 10 yr.	3	5
+ 10 yr.	1	3
Total	14	10

*Still out in 1957

†In mental after-care home

Work Rating in "Recovered" Patients		
As competent as before illness	5	6
Coping	5	1
Idle or incompetent	3	0
Not contacted	1	3

Symptom Rating in "Recovered" Patients		
None	5	5
Better	6	2
Same	2	0
Worse	0	0
Not contacted	1	3

Age of Admission of "Recovered" Patients		
-20 yr.	3:cc*	1
-30 yr.	5uci	5uu
-40 yr.	4ci	3uc
-50 yr.	2i	1
Total	14	10

Length of Admission to Operation Date of "Recovered" Patients		
- 2 yr.	5ccii	6ccuu
+ 2 yr.	9ccciu	4

Period of Stay after Operation of "Recovered" Patients		
- 1 mth.	0	2u
- 3 mth.	1	2
- 6 mth.	2ci	2uu
- 1 yr.	1i	1c
- 2 yr.	3ciu	0
- 3 yr.	1c	0
- 4 yr.	0	0
- 5 yr.	1	2
- 10 yr.	5cc	0
+ 10 yr.	0	1

*c = coping i = incompetent u = not contacted

Work Rating of Patients during Discharge but Readmitted Later		
As competent as before illness	1	2
Coping	6	2
Idle or incompetent	12	6
Not contacted	0	0
Total	19	10

Symptom Rating Discharged but Later Readmitted		
No symptoms	1	3
Symptoms better	6	0
Symptoms same	8	7
Symptoms worse	4	0
Not contacted	0	0

TABLE II
RESULTS IN AFFECTIVE DISORDERS

	Leucotomies	Controls
Sex Distribution		
Male	11	6
Female	41	42
Total	52	48
(n = 1, $X^2 = 1$, P = 0.3)		
Age on Admission		
-20 yr.	0	0
-30 yr.	2	7
-40 yr.	11	12
-50 yr.	11	9
-60 yr.	20	15
+60 yr.	8	5
Length of Admission to Operation Date		
-1 mth.	18	15
-3 mth.	4	6
-6 mth.	2	5
-1 yr.	3	1
-2 yr.	4	6
-3 yr.	6	8
-4 yr.	5	3
-5 yr.	1	1
-10 yr.	7	2
+10 yr.	2	1
(n = 1, $X^2 = 1.06$, P = 0.3)		
Diagnostic Sub-groups		
Melancholia	39	30
Mania	9	5
Manic-depressive psychosis	4	13
(n = 2, $X^2 = 5.2$, P = > 0.05)		
End-result		
Total	52	48
Never discharged*	21 (13) (7) (1)	14 (10) (2) (2)
Discharged at some time†	26	34
Transferred	5 (4) (1) (0)	0
*Died during first admission	8 (7) (1) (0)	4 (4) (0) (0)
†Died on subsequent admission	1 (1) (0) (0)	3 (1) one (0) died in (2) 1956
Total dead	9	7
Discharge		
Total discharged at some time	26	34
Discharged but subsequently readmitted	10	17
Never readmitted to Runwell Hospital	16 (15) (1) (0)	17 (13) (2) (2)
Readmitted to other hospitals excluding transfers	1	2
Committed suicide after first discharge		1
Total not readmitted to mental hospital since discharge	15	14
Period since Discharge of "Recovered" Patients		
-1 yr.	0	0
-2 yr.	0	0
-3 yr.	0	0
-4 yr.	1	1
-5 yr.	1	0
-6 yr.	2	0
-7 yr.	3	1
-8 yr.	1	1
-9 yr.	2	2
-10 yr.	1	1
+10 yr.	4	7
Total	15	14
Work Rating		
As competent as before illness	6	5
Coping	9	1
Idle or incompetent	0	0
Not contacted	0	8

	Leucotomies	Controls
Symptom Rating		
None	6	6
Better	8	0
Same	1	0
Worse	0	0
Not contacted	0	8
Age on Admission of "Recovered" Patients		
-30 yr.	0	3u
-40 yr.	3cc*	3u
-50 yr.	4c	1u
-60 yr.	6cccc	7-uuuuu
+60 yr.	2cc	0
Total	15	14
Length of admission to Operation of "Recovered" Patients		
-1 mth.	8cccc	5uuuu
-3 mth.	1c	3uu
-6 mth.	0	1
-1 yr.	0	1
-2 yr.	0	1
-3 yr.	2c	2uu
-4 yr.	2c	1c
-5 yr.	1c	0
-10 yr.	1	0
+10 yr.	0	0
Period of Stay after Operation of "Recovered" Patients		
-1 mth.	3c	4uuu
-3 mth.	4ccc	4uuu
-6 mth.	1c	0
-1 yr.	2c	1
-2 yr.	2c	3uuu
-3 yr.	1	1
-4 yr.	0	0
-5 yr.	0	0
-10 yr.	2c	1
+10 yr.	0	0
*c = coping i = incompetent u = not contacted		
Period of Stay after Operation at Runwell Hospital		
-1 mth.	7	5
-3 mth.	7	5
-6 mth.	3	3
-1 yr.	6	6
-2 yr.	4	10
-3 yr.	2	2
-4 yr.	4	5
-5 yr.	1	1
-10 yr.	11	9
+10 yr.	7	2
Total	52	52
Period of Stay after Operation Date in Mental Hospitals		
-1 mth.	5	5
-3 mth.	6	4
-6 mth.	4	3
-1 yr.	6	6
-2 yr.	5	10
-3 yr.	3	2
-4 yr.	3	5
-5 yr.	1	2
-10 yr.	11	9
+10 yr.	8	2
Work Rating of Patients during Discharge but Readmitted Later		
As competent as before illness	0	9
Coping	1	3
Idle or incompetent	10	6
Not contacted	0	1
Total	11	19
Rating of Patients during Symptom Discharge but Readmitted Later		
No symptoms	0	9
Symptoms better	1	4
Symptoms same	9	5
Symptoms worse	1	0
Not contacted	0	1

FIG. 2.—Fifty-two cases of affective disorder subjected to leucotomy compared with 48 controls suffering from affective disorders one to 10 years after operation.

the period in hospital before the operation date, and the period from operation date to discharge are likewise comparable. Thus, similar patients get better in the same time.

Finally, the status of schizophrenic patients who were discharged but later readmitted to hospital is shown as far as work status and symptoms are concerned.

Affective Disorders

Fifty-two cases with affective disorders were found to have been treated by leucotomy and 48 cases were not so treated. These two groups were comparable in their sex and age distribution and in their period of stay in hospital to their operation date (Table II). (Again, each non-leucotomized patient retained the operation date originally allocated to him or her.) The distribution of diagnoses within the affective group is also shown and later results are written out so that single diagnoses—mania, melancholia, manic-depressive psychosis—may be followed. The results as far as discharge are concerned are not significantly different and are also shown in a histogram (Fig. 2).

The two "recovered" groups, leucotomy and control, have been discharged for similar periods and compare as far as can be ascertained in their work and symptom status. At least it is clearly impossible for the controls to do worse as a group than the leucotomized patients if the results in the untraced patients are made available later. The age distribution and periods in hospital before operation date are comparable in these "recovered" patients. Leucotomy does not accelerate discharge and the total period spent in Runwell and in all mental hospitals after operation date is similar. The work status of re-

admitted patients and their symptom status while out of hospital is shown.

Depression

Dealing with affective disorders as a cohesive group gives larger numbers and this is probably one of the reasons why this presentation is used. It can be seen, however (Table III), that the three diagnostic subgroups behave rather differently as far as outcome is concerned.

TABLE III
RESULTS IN AFFECTIVE DISORDERS REGARDLESS OF TREATMENT

	Never Discharged	Discharged never Readmitted	Discharged and Readmitted	Total
Manic depressive psychosis	3 (17.6%)	2 (11.8%)	12 (70.6%)	17
Mania	9 (64.3%)	5 (35.7%)	0 (0%)	14
Depression	23 (33.3%)	31 (44.9%)	15 (21.8%)	69

The numbers here are small but regardless of treatment manic-depressive patients (cyclothymes) are most frequently discharged and also most frequently readmitted; depressive patients almost as frequently leave hospital and the majority remain well while manic patients have a tendency to chronicity although when they do recover they do well. It is conceivable that this is an artefact which arises from psychiatrists allocating recurring cases to the manic-depressive group. On the other hand, if it is a real effect it can be seen that the distribution of these diagnoses in the affective group will affect the expected results of the group as a whole. Only in depressions, however, was a sufficient number of cases available to examine the question further.

Thirty-nine cases of depression were treated with leucotomy and 30 without the operation (Table III). The results in these cases are closely comparable.

Paraphrenia (Paranoid Psychosis)

The vast majority of this group were diagnosed as suffering from "paraphrenia" and only four cases were classified as "paranoid psychoses", two controls and two leucotomies. Twenty-two patients were treated with leucotomy and 17 were not so treated. The sex distribution, age distribution, and period of stay in hospital to operation date were comparable in the two groups (Table IV). The results likewise closely resemble each other.

TABLE IV

RESULTS IN 69 PATIENTS SUFFERING FROM DEPRESSION AND TREATED IN GROUPS KNOWN TO BE COMPARABLE FOR SEX, AGE, AND CHRONICITY

	Leucotomies	Controls
Total	39	30
Never discharged*	13	10
Discharged at any time	22	20
Transferred	4	0
Readmitted to Runwell Hospital†	7	7
Readmitted to other mental hospitals	1	3
Not readmitted since discharge	14	10
*Died on first admission	7	4
†Died on subsequent admission	1	1
Total dead	8	5

Epilepsy

Fourteen epileptics were treated with leucotomy and 13 were not so treated. Once again the results in the two groups (Table V) resemble each other closely.

Summary

The therapeutic results in cases treated by leucotomy were compared with those in patients of the same diagnosis and shown to be comparable in age, sex, and chronicity distributions, but not treated by leucotomy.

The proportion of schizophrenics discharged after the operation was greater than in the control group but the number of subsequent readmissions was also greater, so that the long-term results are comparable in the two groups.

No advantage was shown to be offered by leucotomy in affective disorders, in depression in particular, in paraphrenia, or in epilepsy, when comparisons were made with the results in similar patients not so treated. The patients who recover in the leucotomy and non-leucotomy groups appear to be comparable when sufficient numbers were available for analysis.

TABLE V
RESULTS IN PARAPHRENIA (PARANOID PSYCHOSIS)

	Leucotomies	Controls
<i>Sex distribution</i>		
Total in each group	22	17
Male	3	1
Female	19	16
<i>Ages on Admission</i>		
- 30 yr.	1	0
- 40 yr.	3	6
- 50 yr.	13	8
- 60 yr.	4	2
+ 60 yr.	1	1
<i>Period from Admission to Operation Date</i>		
- 1 mth.	1	2
- 3 mth.	3	2
- 6 mth.	0	2
- 1 yr.	0	1
- 2 yr.	6	3
- 3 yr.	6	1
- 4 yr.	1	1
- 5 yr.	2	0
- 10 yr.	3	5
+ 10 yr.	0	0
<i>End-results</i>		
Never discharged (died)	14 (4)	11 (2)
Discharged at some time	7	6
Transferred	1	0
Total	22	17
Readmitted to Runwell Hospital	1	2
Readmitted to other mental hospitals	1	1
Not readmitted to hospital since discharge	5	3

TABLE VI

RESULTS IN 27 CASES DIAGNOSED AS EPILEPSY AND TREATED IN GROUPS KNOWN TO BE COMPARABLE FOR AGE, SEX DISTRIBUTION, AND CHRONICITY

	Leucotomies	Controls
Never discharged	10	8
Died on same admission	1	3
Discharged at some time	3	5
Transferred	1	0
Total	15	16
Readmitted to Runwell Hospital	0	3
Died on subsequent admission	0	2
Readmitted to other mental hospitals	1	2
Not readmitted to hospital since discharge	2	0

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REFERENCE

Robin, A. A. (1958). *J. Neurol Neurosurg. Psychiat.*, 21, 262.