Personality Changes Following Transorbital Lobotomy[1]

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Although the Transorbital Lobotomy operation has been used extensively since 1946, there has been a paucity of experimental research on the effectiveness of this operation. Although much interest has been manifest in the psychological changes following this operation, the findings have been inconclusive and obscure. This may be due in part to a lack of sensitivity of some of our measuring instruments but another reason for these inconclusive results has been the lack of rigid experimental controls.

In many studies psychological tests have been administered to a few patients pre- and post-operatively. However, the experimenters often failed to validate their results by matching the operative group with a comparable group (in terms of age, sex, diagnosis, and etc.) who were treated alike in every respect with the exception that they did not receive the operation.

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Due to the relative simplicity and brevity of this operation along with the need for some type of aid for those patients who suffer chronic and severe states of mental illness, many psychiatric hospitals have utilized this operative procedure despite the fact that there is little conclusive and objective knowledge concerning the results.

In view of the present general acceptance of these surgical measures more precise investigations need to be undertaken for three purposes: (1) To determine more precisely those psychological changes which have occurred, (2) to furnish an objective basis for evaluating the effectiveness of Transorbital Lobotomy, and (3) to be able to select those patients for whom this operative procedure seems warranted.

Review of the literature indicates that some of the changes which are felt to result from lobotomy are: a decrease in anxiety and tension (7, p. 658); some loss of insight and the ability to introspect (5); some loss of creativity (7, p. 417); but a better personality integration which reflects a total improved personality adjustment. This study attempts to validate these empirical findings and, in addition, attempts to determine if there is a loss of enthusiasm and zeal and to ascertain whether or not pathological indications of brain damage will be evidenced as a result of the Transorbital Lobotomy.

Statement of Problem

This study has as its overall purpose the task of attempting to denote the personality changes which are effected by the Transorbital Lobotomy operation. In this study these factors were assessed by the Rorschach Test which is commonly thought to delineate the structure of personality.

Klopfer (9, pp. 279-281) states that *m* reflects tensions within the personality structure. He adds that the individual experiences such promptings from within as hostile and uncontrollable forces working upon him rather than a source of energy at his disposal. If the lobotomy has the effect of reducing tension, a dimunition of *m* would be expected.

It is generally believed that the lobotomy has the effect of lessening anxiety, apprehensions, and fears. Klopfer (14) states, "Every single *k* and every *K* response other than 'clouds' to Card VII is an expression of some anxiety." Therefore, it is hypothecated that fewer *K* and *k* determinants will be elicited post-operatively.

It is being hypothecated that the lobotomized patient loses much of his ability to introspect. That is, there is a lessening of his critical self-appraisal and insight. Thus, a decrease in that measure of introspective, self-awareness, *FK*, would be expected in the Rorschach protocols subsequent to the operation.

If creative imagination is reduced in those patients who have been subjected to lobotomy, it would be expected that this Rorschach determinant, *M*, should decrease.

As the Transorbital Lobotomy operation has the effect of destroying cortical tissue, it would be expected that this cortical damage should be revealed as organic pathology on the Rorschach test. The extent of such pathology is evaluated in this study by the use of a checklist proposed by Dorken and Kral (3).

If the lobotomized patient has lost his ardent enthusiasm and active interest, this should be reflected by prolonged reaction times to the ten Rorschach cards.

Finally, if the Transorbital Lobotomy operation is to effect a better level of adjustment the Rorschach Test should manifest this improvement.

Therefore, it would be expected that two quantitative measures of general adjustment, the Munroe checklist (12) and the Harrower-Erickson checklist (8), would reflect the improved level of adjustment.

Method and Procedure

All the subjects in this experiment were patients at Western State Hospital, Staunton, Virginia. The operative group of eight psychotic patients were selected for the Transorbital Lobotomy operation on the basis of two criteria: (1) They had failed to respond to all types of therapy employed at this hospital; and (2) The relatives of these patients had signed operative permits. Our control group was derived from the parent hospital population of approximately 2,500. When this population was studied for possible controls matched on seven criteria (sex, age, education, diagnosis, treatment, duration of hospitalization, and duration of illness) eight control subjects were obtained.

TABLE I

Comparison of Control and Experimental Groups in Terms of Matching Criteria

Mean	Sex	Age	Education	Duration of Hospitalization	Duration of Illness
Experimental Group	1 male 7 females	48	9 yrs. 9 mo.	6 yrs.	12 yrs. 3 mo.
Control Group	1 male 7 females	45	10 yrs. 7 mo.	5 yrs. 1 mo.	12 yrs.

Table I evidences a comparison of the two groups for five of the seven matching criteria. In regard to diagnosis, each group contained six schizophrenics, one involutional-paranoid, and one manic-depressive, depressed type. All patients in both groups had received extensive electroshock therapy with the exception of one matched pair who had received no therapy of this type prior to the experiment.

One month prior to the operation, all subjects of both groups were given the Rorschach Test. In an attempt to control all variables, from this time until one month after the operation the "buddy system" was rigidly enforced. That is, patients of the experimental group and patients of the control group were paired and housed on the same wards, went to Occupational Therapy together daily, participated in the same recreational activities, ate at the same time, and etc. One month from the date of testing the experimental group received the operation. For this operation it is customary to use electro-convulsive shock to induce anesthesia. In similar fashion, the control group was given the same intensity and number of electro-shock treatments at this time but did not receive the operation. One month following the date of operation the Rorschach Test was again readministered to all the subjects in both groups. The thirty-two Rorschach protocols were scored by the senior author employing the Klopfer and Kelley (9) system of scoring. The identity of each protocol was masked and all protocols were scored in random order.

Results

Cronbach (2) criticises the use of many of the commonly employed statistical techniques in Rorschach research because they do not control for the inequality of the scale intervals and the skewness of the distribution of the data. To meet these requirements made explicit by Cronbach concerning the non-equality of points along the continua and the non-normal character of our data, we chose a non-paramatric or distribution free method of analysis (11). This particular non-parametric method ranks the original

data and then evaluates the probability of obtaining the lowest total ranking regardless of sign. It should be noted that this procedure does not require normality of distribution or equal scale intervals. Since we matched our subjects we used a further development of this non-parametric statistic in that we evaluated the difference between paired score rankings (paired replicates) (15) and evaluated the probability of obtaining the lowest sum of paired rankings regardless of sign.

TABLE II

The Lower Rank Total of the Same Sign for Comparisons Between Groups on Ten Rorschach Factors and Three Rorschach Checklists.

RORSCHACH FACTORS	LOWER RANK TOTAL	RORSCHACH FACTORS	LOWER RANK TOTAL
FC%	−9.00	Rejections	−6.50
P%	+18.00	Responses	−11.00
m%	−1.00**	Reaction Time	+3.00*
M%	+7.50	*Checklists*	
W%	+4.00*	Harrower-Erickson	±13.00
FK%	−3.50*	Munroe	+13.50
K% & k%	−7.00	Dorken & Kral	−6.00

* Significant at 5% level
** Significant at 2% level

Inspection of Table II indicates that four of the ten Rorschach factors significantly differentiate between the control and experimental groups. The positive and negative signs preceding the lower rank total indicate an increase or decrease respectively of the measured factor for the post-operative experimental group as contrasted with the control group. Thus, it can be seen that there is a significant decrease of *m*% and FK% and a significant increase in W% and Reaction Time in the experimental group following the operation. All other factors studied were not significant although there are obvious trends in regard to organicity (as measured by the Dorken and Kral checklist), number of rejections, K% & k%, and M%.

DISCUSSION

From these data it can be inferred that the Transorbital Lobotomy operation produces or results in a lessening of inner tension, a lessening of critical self-appraisal and insight, and a loss of ardent enthusiasm and active interest or zeal. The significant increase in W% is difficult to interpret except as some change in apperception, although it may indicate a better organizational ability.

Current literature contains abundant qualitative information concerning the functions of the frontal lobes. According to Freeman and Watts (7 p. 658), this operation upon the frontal lobes "succeeds because it divorces psychotic ideas from accompanying emotional components." They state that the psychotic ideas usually persist for a while following the operation but gradually fade away. This is due to the sectioning of the anterior thalamocortical projections, "through which the affective and emotional charges surge to the prefrontal areas to become integrated with the intellectual processes of foresight, imagination, and consciousness of self."

Freeman (7, p. 658) has emphasized the point that " . . . emotional tension is the prime requisite for success in Prefrontal Lobotomy." It appears that as yet there is no psychiatric diagnosis that causes one to think immediately of psychosurgery. Rather, there is a constellation of symptoms

described by Arnot (1) as "a fixed state of tortured self-concern." Inner emotional tension is implied by this description and Robinson (20) states the following in this regard: "Psychosurgery, then, not only relieves emotional tension; it prevents the development of future tensions by reducing the individual's awareness of his own self-continuity." The most significant finding in the present study, a pronounced decrease of *m%*, tends to confirm these empirical findings concerning a lessening of tension as a result of this operative procedure upon the frontal lobes.

Freeman and Watts (7, Pp. 3-4) have also advanced the hypothesis that the frontal lobes are especially concerned with foresight and insight and that the emotional component associated with these functions is supplied by the thalamus. They feel that when the thalamic connections are severed, the functions of foresight and insight suffer temporary obliteration, "and even in the later course of recovery are never as completely endowed with feeling tone as they were before." The finding in this study of a significant decrease in FK% for the experimental group lends support to this hypothesis in regard to a lessening of critical self-appraisal and insight as a result of the Transorbital Lobotomy operation. Thus, the patient would tend to dwell less upon the morbid internal preoccupations and become more externally oriented.

The significantly prolonged reaction times seen in this study as a result of the operation may well be related to what has been postulated by Landis (10). He believes that the lobotomized patient lacks vigilance, that is, "He is acting as though he were sleepy, often making such remarks as, 'I'm too tired to do this'." Landis further feels that the lobotomized patient has lost his zealousness . . . his ardent enthusiasm and active interest.

There seems to be conflicting and obscure evidence concerning signs of intra-cranial pathology due to lobotomy as shown by psychological tests. In this regard, Freeman (4) states that "The failure of mental tests to reveal either positive or negative symptoms after removal of a considerable portion of both frontal lobes means either that the tests heretofore developed are not sensitive to the defects, or that the powers of compensation on the part of the remaining portions of the frontal lobes are so great that no measurable defect remains." Although the authors of this study utilized a brain damage checklist thought to be more sensitive than that proposed by Piotrowski (13), no significant increase of organic signs was demonstrated in the experimental group as a result of the operation. In the same light, the failure of both the Munroe and Harrower-Erickson checklists to demonstrate any quantifiable improvement of total adjustment in the operative group may also be due to the fact that these checklists are too insensitive for this particular discrimination.

It is to be noted that although non-significant, four of the factors which were studied did approach the defined level of significance. In the experimental group as contrasted with the control group there was an obvious decrease in the number of rejections, in *K%* & *k%*, and in *M%* along with an increase in signs of intra-cranial pathology. With a larger control and experimental population it is possible that significant evidence of brain damage and a significant decrease of emotional blocking, anxiety, and creativity will be more clearly seen.

In 1946, Freeman (7, p. 657) stated that "Statistics are a poor medium by means of which to convey the changes that occur in patients following Prefrontal Lobotomy." He felt that the empirical evidence of change in some of these patients and their resulting transformation into placid, quiet, uncomplaining individuals who showed little concern about their troubles, was justification enough for the more drastic operative procedures. However, the authors of this study are of the opinion that only by precise investigations can the psychological changes be determined. And it can

only be from an accurate knowledge of these changes that an objective basis for the evaluation of the effectiveness of the Transorbital Lobotomy operation be established. Furthermore, we will be better able to select those patients for whom this operative procedure seems warranted if we have precise and objective knowledge of those personality characteristics which are most amenable to change due to this type of psychosurgery.

SUMMARY

This study was designed to investigate the personality changes effected by a particular type of psychosurgery, the Transorbital Lobotomy operation. The experimental, or operative group was comprised of eight hospitalized psychotic patients. From the parent hospital population eight control subjects were selected on the basis of their close resemblance to the experimental group in regard to seven criteria by which they were matched. The Rorschach Test was administered to both groups one month prior to and one month following the date when the experimental group received the operation. During the interim between pre and post testing every effort was made to control environmental variables so that members of each matched pair were treated alike with the exception that the controls did not receive the operation. The controls wer given the same number and intensity of electro-shock treatments as were given the experimental subjects on the operative date.

Four Rorschach factors significantly differentiated between the control and experimental groups. There was a significant decrease of *m%* and *FK%* and a significant increase in *W%* and Reaction time in the experimental group following the operation. From these data it can be inferred that the Transorbital Lobotomy operation results in a lessening of inner tension, a lessening of critical self-appraisal and insight, and a loss of ardent enthusiasm and active interest. The significant increase in *W%* is difficult to interpret except as some change in apperception, although it may indicate a better organizational ability.

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