

in other areas in cases which have failed to show an initial response. Time must be allowed for accurate assessment. It is important to persevere in producing accurate lesions time and again in the same areas so that prolonged pre- and post-operative study of groups of patients may reveal differences in response in different clinical sub-categories; in this way surgery may provide not only a useful form of therapy but may contribute to a proper understanding of variations which undoubtedly exist within major diagnostic categories.

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Psychosurgery Today: Psychiatric Aspects

A leading article in the *British Medical Journal* (1971) reviewed some lately published studies on the results of psychosurgery and concluded that the assessment of these operations leaves us 'in a state of uncertainty'. The writer suggested that the way out of the dilemma might be for the Royal Colleges of Psychiatrists and of Surgeons to arrange a prospective controlled trial. This would, of course, be desirable but the problems involved in the formulation of such an investigation are formidable. Quite apart from decisions about the types of operation to be included, assigning patients to the modes of treatment, and the diagnostic and historical comparison of patients, there is the problem of the complexity of attitudes involved in the referral of a patient for psychosurgery. As the leading article pointed out, 'a certain rigid extremity of opinion can be predicted' in the present ambivalent climate, both clinical and popular, regarding psychosurgery.

The attitudes, positive or negative, to be considered include those of the patient, his psychiatrist, his general practitioner and his relatives. Any one of these may object strongly to the suggestion of a brain operation and attempt to veto the possibility put forward by one of the others. It should be realized that psychiatrists are not the only original source of referral and sometimes the initiative comes from others. For example, in a series to be considered later, 3 of the 50 cases reviewed came directly from family doctors. This is not accepted as the most satisfactory mode of referral but there were in each of these cases special reasons for it. An example was a young woman with a long history of unsuccessful attempts at psychiatric treatment at a number of different hospitals. This had produced desperation in the patient who refused to see another psychiatrist, and she was with difficulty supported by her general practitioner for a long period before he came to think that operation might be of value and referred the patient for assessment.

Several of our patients have referred themselves in various ways, probably not all at a conscious level. One young man wrote directly to the Unit asking for the operation, which he had seen mentioned in a publication, and he was referred back to the psychiatrist looking after him who then felt that an assessment was appropriate. Another man with chronic and quite severe social anxieties prematurely ended all attempts at psychiatric treatment, including medication,

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admission and psychotherapy, until he saw a psychiatrist who suggested psychosurgery, to which the patient keenly agreed. Clearly this man was unconsciously awaiting the offer of a 'miraculous' treatment. This high expectation from an apparently drastic procedure which the patient hopes will produce immediate improvement, which does not involve him in psychological effort, and which may gratify other fantasies, is occasionally an important ingredient in the referral.

The initiative may come from a relative. A recent patient had had an attack of depression each year for the previous five years which lasted some four to six months. This annually recurring period of misery for the patient and his wife caused her to press him to get some more definitive treatment, and as a result psychosurgery was undertaken.

These then are a few of the modes and psychodynamics of referral. At the extremes, there are patients and their doctors who would never consider psychosurgery while some other patients tend to be unrealistically enthusiastic about it. Most cases, however, are referred for assessment after a complex interchange beginning with the initial suggestion, which may then include doubt, anxiety, resistance, expectation of improvement and active interest, all with varying emphasis from the different people involved - the patient, his psychiatrist, family doctor and others. These aspects of motivation and expectation must be taken into account as well as the clinical presentation in coming to a decision about the desirability and possible effects of operation.

In the clinical assessment the problems are largely with the notorious uncertainties and deceptions of psychiatric diagnosis and of psychiatric presentations. The difficulties are similar to those involved in, for example, forecasting the outcome after electroconvulsive therapy (ECT), although this is obviously a less fundamental procedure that is as a result easier to recommend. However, published studies concerning the results of psychosurgery and our continuing follow-up investigations begin to suggest fairly clear indications in typical cases; atypical presentations must continue to offer special problems.

The operation principally considered here is that of stereotactic yttrium implantation devised by Knight (1969), which is an effective treatment associated with side-effects which are usually absent or only slight. By contrast, Post *et al.* (1968) reported on 52 patients who underwent a modified bimodal leucotomy, a different type of operation, among whom the 'lasting and troublesome defects' or 'seriously disabling defects' involved some 30%. However, in a more recent

study by Kelly *et al.* (1972) describing the results of various modified types of leucotomy, severe personality change was found less often, occurring in only 1 of 40 patients, but the details of follow up in this study are less clear. The results of Knight's tractotomy involving the innominate area, reported by Ström-Olsen & Carlisle (1971) on a large series, are not entirely comparable but they show the absence of major personality changes, and this is very much our continuing experience. They give the incidence of 'moderate or lasting sequelæ' as 2.6% and persisting epilepsy occurred in less than 1%. So the operation is unlikely to produce troublesome results even in those cases where the psychiatric symptoms are not improved. As a result, the decision to undertake a stereotactic tractotomy is less onerous than with modified leucotomy. In considering tractotomy, while the case may be such that one is not confident of a good result, it may be thought worth trying to help a psychiatrically disabled patient by surgical means with little fear of unpleasant effects occurring.

For example, emotional blunting is not a side-effect of innominate tractotomy and the results of the operation do not appear to occur as an effect of nonspecific reduction in responsiveness, as may be found with some leucotomy procedures. The side-effects of tractotomy principally include volubility, outspokenness, irritability and lethargy; such effects can be a nuisance in a very few cases but are, as published figures show, almost never socially disabling. In the immediate postoperative period, confusion is sometimes a complication. This usually lasts only a few days but can be present for longer in older patients, although in no case has it proved permanent. It appears to be an age-related effect and is unlikely to occur in those under 50 years old, while it is to be expected for a time in most elderly patients.

The recent detailed follow up study by Ström-Olsen & Carlisle (1971) makes it unnecessary to offer a further review of postoperative results at this stage and some practical clinical aspects are now considered. Some of the points are illustrated by figures obtained from 50 consecutive patients

Table 1

Age and sex distribution in a series of 50 patients

Age	Male	Female	Total		Ström-Olsen & Carlisle (1971) (%)
			No.	%	
20-29	-	2	2	4	10
30-39	6	9	15	30	20
40-49	-	6	6	12	21
50-59	2	6	8	16	18
60-69	3	12	15	30	21
70-79	2	2	4	8	7
80+	-	-	-	-	3
Total	13	37	50		

operated on recently. Table 1 gives the age and sex distribution, with percentage findings from Ström-Olsen's review presented for comparison. While the Psychosurgery Unit is part of the Regional Neurosurgical Centre for the South East Metropolitan Region, 40% of the patients came from outside the region. Apart from the 3 patients referred by GPs, the remaining 47 were referred by 37 psychiatrists in 25 different psychiatric hospitals of which seven hospitals are within the Region. The diagnoses of the patients are given in Table 2, grouped under general headings. It is clear that most of the cases were suffering from disabling depression and about one-quarter presented with anxiety or tension. Nearly two-thirds of the patients had previously had ECT and 2 patients had undergone psychosurgery before.

Table 2

Diagnoses and previous treatments in 50 patients

	Male	Female	Total %
Diagnoses:			
Recurrent or chronic endogenous or involuntional depression	4	15	38
Primary tension or anxiety	3	9	24
Other cases of depression and anxiety (with obsessions, phobic symptoms, &c.)	3	5	16
Hypochondriasis	1	1	4
Obsessional neurosis	1	2	6
Atypical cases	1	5	12
Previous treatment:			
ECT	9	22	62
Psychosurgery	1	1	4

These findings relate to the report of Ström-Olsen & Carlisle (1971) that innominate tractotomy is most helpful in cases with definite depression; its prime indication appears to be severe chronic depression which responds to established treatments such as antidepressant medication or ECT, but where the response is transient or where continuing, intense treatment is required. Patients with the symptoms of endogenous depression who do not respond to ECT may also be helped but the prognosis is then rather less certain. Just as ECT may be effective when antidepressant medication fails, so psychosurgery appears to be of value in appropriate cases when ECT has not relieved symptoms.

It may be surprising that operation should ever need to be considered for depression, for which there are most effective therapies currently available. However, patients requiring potentially damaging amounts of ECT to keep well are obvious candidates, and the use of drugs such as tranlycypromine and lithium for long periods is likely to be associated with more risk and often more inconvenience than is psychosurgery. Further, there are those patients whose response

to established treatments is partial or absent but who respond well to psychosurgery.

Chronicity is not the only criterion for operation and severity of symptoms may be an important factor. Recently a girl of 24 years was referred to us who first became very tense and depressed three years previously, after the birth of her child. One year before operation the depression increased in severity and became associated with severe obsessional rituals so that she spent all day cleaning her house persistently. During this period she was admitted to a psychiatric hospital for some six months and had ECT with little improvement. On discharge she remained unable to manage her home and family by herself. This patient left hospital for home two weeks postoperatively and has required no further treatment of any kind in the year since then, which is a decisive result in a young patient with a relatively short but very incapacitating illness.

Tension and anxiety are less easy to assess. Ström-Olsen & Carlisle found that 41% of patients complaining of these symptoms did well. It may be that when the symptom is associated with depression it is more likely to respond. Certainly tractotomy does not appear to produce a nonspecific reduction in tension in all patients with this symptom, which again suggests that the operation is specific and does not merely produce a generalized reduction in emotional responsiveness. The problem of phobic anxiety is being specially considered at the moment and the value of modified leucotomy in agoraphobia was reported in a controlled retrospective study by Marks *et al.* (1966). Improvement after tractotomy was shown by one of our patients, who offers a good illustration of several of the clinical aspects involved:

Case History

This patient was a professional woman aged 29. Since childhood she had tended to feel excessively anxious and tense especially in crowded places. During the previous four years she had become increasingly depressed. The patient began to take barbiturates at night and then during the day, with dependence occurring. After operation the depression cleared, she was able to leave barbiturates entirely alone and had fewer panic attacks. She resumed work but slowly phobic anxiety became increasingly troublesome and she had to travel to work by taxi. She was then treated with phenelzine and she began to take increasingly high doses. She was admitted for reassessment because of antisocial behaviour thought to be attributable to the operation. On admission she was elated but remained phobic and she could not leave the ward without severe anxiety. In retrospect it seems clear that she was trying to control her phobic state by taking excessive amounts of phenelzine which caused elation without affecting the anxiety and then began to produce social complications because of abnormal

behaviour. Desensitization was undertaken by methods described by Gaind *et al.* (1971) and was ultimately completely successful.

This case emphasizes the considerable importance of ancillary treatments after operation, and indicates that while the operation may well reduce a tendency to pathological anxiety, established phobic symptoms may need active behaviour therapy postoperatively.

The indications for psychosurgery in cases of obsessional neurosis are becoming clearer. An initial review of patients showed that although some did well, others were not improved. It is probable that obsessional symptoms do not necessarily indicate the presence of a particular illness but may arise from more than one cause.

Table 3

Results of operation in patients with primary obsessional complaints (Ström-Olsen's data)

Clinical result	No. of cases	Mean age		
		At onset	At operation	Years between
'Recovered' or 'improved' with slight residual symptoms	14	31a	45	14
Improved with persistent symptoms	5	26	35	9
Unchanged	8	20b	38	18

a v. b $P < 0.05$

Table 3 summarizes the outcome in Ström-Olsen's series of patients who presented before operation primarily with obsessional symptoms. The figures show that obsessional neurosis responds less well when it is of early onset than when the symptoms begin later in life.

The possibility is suggested that tractotomy is less effective in the true obsessional neurosis, which Pollitt (1957) described as beginning at a mean age of 20–21 years. When obsessional symptoms occur later it may be that they are then more likely to be associated with a depressive illness and so are responsive to innominate tractotomy; for example, the girl of 24 years mentioned earlier was incapacitated by obsessional symptoms starting early in her third decade, but since they were probably associated with a puerperal depression the response to innominate tractotomy was good. So not all cases with an early onset do badly. It is likely that for the true obsessional illness surgery has to be undertaken at another site and the cingulate area has been considered for this (Lewin 1961). We carry out yttrium implantation in the cingulate region for some such cases and our experience is that there may be reduction in tension which, with adequate postoperative psychiatric treatment often involving attempted disruption of established obsessional behaviour,

may help severely obsessional patients to manage better without necessarily being curative. Cingulate and innominate area operations can often be usefully combined.

There are no strong contraindications to stereotactic tractotomy. While a poor personality and an unsupportive background may suggest a reactive kind of illness less likely to be helped by tractotomy, if there are symptoms present which offer a positive indication for operation, these other factors need not affect the outcome adversely, although their presence may limit the degree of therapeutic success. Indeed, the personality may be stabilized and patients better able to manage a difficult social environment after operation when they are less incapacitated by depression or other symptoms. This is another aspect in which there appear to be differences between innominate tractotomy and modified leucotomy, for Post *et al.* (1968) have stressed the great importance in the latter case of a supportive family background and a stable personality.

Old people usually do well with tractotomy and apart from a period of confusion, which may be troublesome for a time, they present no special problems. Old age itself is not a contraindication and the operation is of special value where repeated or long courses of ECT are required to control depression in an elderly patient, when confusion and dementia are very likely to be caused.

Obviously, rather more caution is needed in recommending operation for younger and especially highly intelligent people, in whom the indications should be clearer and stronger. However, the evidence is that even modified leucotomy probably has no significant adverse effect on intelligence (Meyer 1960). Our preliminary results on this point are set out in Table 4. The increase in the performance score could be related to therapeutic improvement, and it is clear that no deterioration is apparent in this small series, to which further results are now being added. Schizophrenia is not improved by innominate tractotomy, although cingulate operations may modify aggressive or persistently disturbed behaviour in those few cases who do not respond to adequate medication.

The importance of rehabilitation for all patients after psychosurgery cannot be overemphasized.

Table 4

Wechsler Adult Intelligence Scale: mean values
15 patients (8 men, 7 women), mean age 45 years (range 21–73)

	Preoperation	Post-operation	
		One month	One year
Full scale	96.5	97.7	100.0
Verbal	99.9	98.3	100.8
Performance	92.9	97.2	99.0

The need is to overcome postoperative lethargy in the short term and to help the patient realize new potentials in the longer term. Established unhealthy patterns of behaviour resulting from severe and chronic illness need to be dispelled, help is required in increasing the patient's confidence, and encouragement with the resumption of a normal social life may be needed. This is especially so as many patients come to psychosurgery after chronic illness and often after a long period in hospital which inevitably have bad effects on the personality, not directly affected by the operation.

Occasionally patients recover immediately after operation and never look back. More often there is a slow response over three to six months and this possibility is made clear to patients, who tend to look for dramatic and immediate improvement. Some patients may need to remain in hospital for up to a year after operation, and this is especially so after very chronic illness. Almost invariably medication is stopped after operation and anti-convulsants are not given routinely. By discharging the patient without tablets, a period is allowed in which the response to the operation can be observed and the continuation of medication without reassessment is avoided. However, there is no absolute restriction on medication post-operatively and later, for example, antidepressants or even a further course of ECT may be helpful. Evidence is accumulating that routine treatments, if needed, can be more effective after operation than before.

One psychiatrist wrote to us: 'Quite frankly consideration of brain surgery is a last resort'. These feelings are understandable but this should not be the approach to psychosurgery. There is a definite place for tractotomy which is becoming clearer clinically, and severely ill or chronically incapacitated patients need not be left too long before this particular operation is considered. Further, the pessimism engendered by feelings of 'last resort' treatment produces an adverse medical climate which can lead to therapeutic nihilism postoperatively at a time when the opportunity is presented for rehabilitation and a renewed attempt at treatment. At the least psychosurgery can offer the chance of a fresh therapeutic approach; at its most effective it can be rapidly and permanently curative despite the chronicity or severity of the illness. While psychosurgery can never be undertaken lightly and must only be considered when other treatments have failed or have produced disadvantageous effects, for appropriate cases the possibility of operation should not be left too long, until it has indeed become a last hopeless attempt to which both patient and doctor are decreasingly able to respond.

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Meeting March 14 1972

The following papers were read:

Stuttering

Dr G E Donovan

Psychological Change and Its Relation to Increased Fluency in Stutterers

Dr Fay Fransella

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- Fransella F
 (1971) *Journal of Psychosomatic Research* 15, 433-438
 (1972) *Personal Change and Reconstruction*.
 Academic Press, London (in press)

Meeting May 9 1972

at St Bartholomew's Hospital, London EC1

The following cases and demonstration were presented:

Anxiety Treated by the Lactate Flooding Technique

Dr John Bonn

REFERENCE

- Bonn J A, Harrison J & Rees W L
 (1971) *British Journal of Psychiatry* 119, 468-470

- (1) **Anorexia Nervosa Treated with Specific Desensitization**
 (2) **Occupational Cramp in a Musician Treated with Behaviour Therapy**
 Dr Trevor Silverstone

Obsessional Neurosis Treated with Behaviour Therapy (Two Cases)

Dr Maurice Lipsedge

Application of Modern Technology to the Problems in a Sub-normal Hospital (Demonstration)

Mr Christopher Dunk (*St Bartholomew's and South Ockendon Research Unit for the Sub-normal, South Ockendon Hospital, Essex*)