ANTERIOR CINGULECTOMY IN MAN

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The first series of bilateral anterior cingulectomies in man was reported in 1949.13,14 Since then the operation has met with increasing success in various clinics. It seems worth while to present at this time the therapeutic and psychological results in the first 50 cases in our series. This group does not include 18 "mesial undercuttings."

Just before the War we were studying the aftereffects of the total removal of gliomas of the anterior half of the corpus callosum.4,29 The rarity and insignificance of the so-called postoperative frontal syndrome was a first point. A second was the postoperative disappearance of "imperviousness."71 This apathetic state, then, is probably caused not by callosal interruption, but by bilateral pressure on the mesial frontal surface.

Later, in the treatment of some states of agitated behaviour, it became possible to compare the results of classical lobotomy with those of limited resection of the convexity, or topectomy, introduced by Pool.21 Topectomy seemed to us definitely less successful when the agitation and violence were apparently not related to anxiety. Perhaps, then, it would be necessary to resect the mesial aspect of the frontal lobe in order to deal with an active psychomotor component, different from the passive element in cases of anxiety and intractable pain.

In physiological experiments (cingular resections in monkeys) Smith25 and Ward28 observed a postoperative state of tameness and placidity. That was a further incentive to perform cingulectomy in man, even without Papez's19 well-known theory of the importance of the temporodiencephalo-cingular circuit in emotions. At least it was suggestive that the thalamo-cingular fibers came from the anterior nucleus, while the dorso-medial nucleus connected with the granular frontal cortex. Accordingly, when we embarked on a program of systematic study of the clinical and psychological effects of different limited frontal operations, the comparison between granular areas 9 and 10, and agranular area 24, i.e. between topectomy and anterior cingulectomy, was given a high priority. The first cingulectomies were performed in 1948 and the main features relating thereto were described in successive papers from 1949 to 1953: clinical results in agitated behaviour and epilepsy,5,6,7,13,14 and in psychoneuroses, especially obsessive;9,10,11 detailed operative technique,10,13,14 description of the special postoperative syndrome;9,11,13,14 and objective psychological study.11,15,16

SURGICAL TECHNIQUE AND COMPLICATIONS

The technique has been described previously10,13,14 and need not be repeated here. However, the following main points may be emphasized:
General or local anesthesia is used, according to the cooperation of the patient and the way in which corticography is performed.

A unilateral frontal bone flap (left or right) is made tangential to the longitudinal venous sinus, 2 cm. in front of the coronal suture and 3 cm. above the orbital ridge.

The left frontal lobe is retracted (often involving section of several subdural veins, but still only on one side) until the free edge of the falx is seen. Then the mesial faces of both frontal lobes are separated down to the corpus callosum, whiter than the surrounding convolutions and partly covered by the two pericallosal arteries giving off ascending branches to areas 8, 9 and 10.

When the genu is well freed, minute holes are pierced in the pia mater of the anterior limbic convolution or area 24, and through them the cortex is aspirated with a fine tube, thus respecting the ascending arteries and contributing to the selectivity of the operation. As both cingular gyri are visible under the falx, the cingulectomy is a bilateral operation with a unilateral approach.

Usually the operation is limited to the anterior part of area 24, 3 cm. long and 1.5 cm. high, but can involve area 25 below the genu 2 cm. more ventrally. This is the typical agranular resection. Often it involves some dysgranular cortex of area 32, 2 cm. more in front of the genu, and sometimes area 12 near the orbital level.

Narrow bands of gelfoam, soaked with lipiodol and then partly dried, are put over the resected areas, both for hemostasis and radiological landmarks (Fig. 1), although the genu is a well-defined structure, impossible to miss.

Thus the operation is much more precise anatomically than any other psychosurgical technique. The only obstacle to selectivity is the unilateral section of some subdural veins, but this does not always happen, and even so there is never a complete interruption of the venous drainage. In view of the strict unilaterality of this slight venous drainage, we doubt very much it could leave a permanent significant effect.

The main vital risk in our operation seems to be the need of prolonged