

## A CHRONIC PREPARATION FOR SPREADING CORTICAL DEPRESSION

ALLEN M. SCHNEIDER AND MICHAEL BEHAR

NEW YORK UNIVERSITY

In recent studies (Travis and Sparks 1963; Travis 1964) employing the technique of spreading cortical depression in rats, the preparation involved repeated retraction of the scalp each time spreading depression was to be initiated. The usual method in preparing the animal, developed by Bures (1959), has been to make a midline incision in the scalp, to expose the brain surfaces of both hemispheres through bilaterally-placed trephine holes, and to secure the scalp with one or two loose sutures. When spreading depression was to be initiated, the sutures were untied, the scalp was retracted, and filter paper soaked with 25% KCl solution was placed through the trephine holes on the surface of the exposed dura.

A less frequently-used preparation has been developed by Russell and Ochs (1963). This preparation requires that small plastic cups, holed at the base, be fitted into bilaterally-placed trephine holes and secured with acrylic resin to jeweler screws inserted in the skull. To initiate spreading depression a cotton pledget soaked with 25% KCl solution is applied to the dura through the hole at the base of the cup.

The present chronic preparation avoids the repeated retraction and consequent irritation of the scalp which occurs with the loose suture technique and provides for a more convenient preparation than the implanted cup technique. In this preparation, a midline incision is made in the scalp and, with a dental burr, oval fenestras 6 mm long and 3 mm wide are made bilaterally in the skull, exposing the parietal brain surfaces of both hemispheres. The incised scalp is then pulled under the upper rim of a rubber grommet and is secured with four sutures (Fig. 1). The lower rim of the grommet is cut away to facilitate suturing the scalp to the wall of the grommet. The dermal layer of the skin is in direct contact with the wall of the grommet, which is pre-

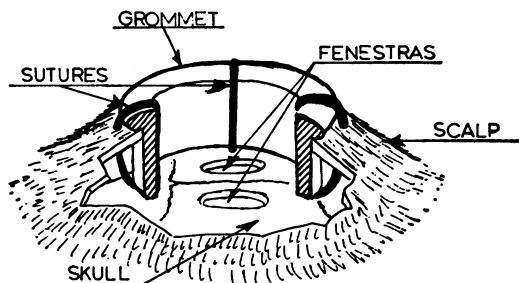


Fig. 1. A cut-away view of the grommet attached to the scalp.

soaked with insul-x to prevent tissue reaction, and non-absorbable silk thread is sutured through the skin and center hole in the grommet. The dura of both hemispheres is readily accessible through the  $\frac{1}{2}$  in. center hole in the grommet, which is carefully secured over both fenestras and plugged with saline-soaked cotton. The cotton is removed and filter paper soaked with 25% KCl solution is placed on the surface of the exposed dura when spreading depression is to be initiated. Thirty albino rats of both sexes, ranging in age from 90 to 150 days, have been prepared in this manner and have successfully responded to spreading depression up to two weeks after the operation. As an additional precaution against infection, all subjects were injected immediately after the operation with an antibiotic, Bicillin.

### REFERENCES

- Bures, J. Reversible decortication and behavior. In M. A. B. Brazier (Ed.), *Second conference on the central nervous system and behavior*. New York: Johsua Macy, Jr., Foundation, 1959, 207-234.
- Russell, I. S. and Ochs, S. Localization of a memory trace in one cortical hemisphere and transfer to the other hemisphere. *Brain*, 1963, **86**, 37-54.
- Travis, R. P. The role of spreading cortical depression in relating the amount of avoidance training to interhemispheric transfer. *J. comp. physiol. Psychol.*, 1964, **57**, 42-46.
- Travis, R. P. and Sparks, D. L. The influence of unilateral and bilateral spreading depression during learning upon subsequent relearning. *J. comp. physiol. Psychol.*, 1963, **56**, 56-59.