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Total Removal of Large Acoustic Neuromas

A Modification of the McKenzie Operation with Special Emphasis on Saving the Facial Nerve

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Perhaps the most important contribution of McKenzie's classic paper in 1956 was his proposal that a prescribed series of steps be taken during total removal of an acoustic neuroma that would reduce the operative time and thus the morbidity and mortality rates. His own mortality record of 12.5% over 30 years in 142 cases is a reflection of his ability and concentration on the difficulties posed by the large tumor. Small tumors were recognized rarely in his day, and he operated on only one such case.

McKenzie would have been deeply interested in recent developments that now make it possible to save the facial nerve during the total removal of most tumors. It therefore seems appropriate to amplify his staging of the operation to include these improvements.

Our experience is based on 30 acoustic neuromas, 27 of which have been completely removed with sacrifice of the facial nerve in only 5 cases. Our early attempts to save the continuity of this nerve were frustrated by the desire to eradicate the residual tumor within the porus by curettage or coagulation. However, it did prove possible to restore a degree of emotional facial action by extra-petrous grafts and, in 1959, by direct anastomosis of the nerve in the angle. We then discovered that in most cases, by a careful dissection at the porus, the stump of tumor within could be tilted out to expose the facial nerve so that it could be preserved during mobilization of the tumor from the petrous bone. The use of magnification has greatly simplified this important stage of the operation.

We shall describe the modified McKenzie operation in three stages, which are the same no matter what operative position is used:

1. Craniotomy and initial exposure of the tumor including separation of the 9th, 10th, and 11th cranial nerves from the lower pole.
2. Isolation of the facial nerve at the porus acusticus.
3. Dissection of the tumor from the brain stem, including recognition and preservation of proximal and central segments of the facial nerve.

Stage 1. Craniotomy

We prefer to perform this operation in the sitting position (Fig. A) which provides excellent access to the angle and encourages a natural drainage of blood and cerebrospinal fluid that helps to keep the field clear. We have had no instance of air embolism, but provision should be made so that the patient can be lowered quickly. The narrow towel holding the patient's head in the rest should be fastened to the scalp with a single towel clip whose exact position is known to the anesthetist. An esophageal stethoscope or microphone may be used to indicate the first entry of air into the heart. In doubtful cases the craniotomy can be small and lateral until the presence of tumor is verified.

We prefer the classical horseshoe incision to the midline one (B). We tried the straight incision but found that the muscle masses could not be retracted sufficiently to prevent some deepening and confinement in the exposure. For the average large tumor, the bone should be removed to the midline and through the foramen magnum to provide clear and direct access for the dissection along the brain stem (B). The dura is opened obliquely from the edge of the lateral sinus just through the foramen magnum; then the lower leaf is divided and the flaps tied back. When the cerebellum is excessively tight, the lateral ventricle is tapped through an occipital burr hole which can also be used if the need for urgent postoperative relief of pressure arises.