Neurosurgical Techniques

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The Removal of Acoustic Neurinomas

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I always operate with the patient in the face-down position. The head is rotated slightly towards the side of the tumor and fixed with tape in this position (Fig. 1A).

Fig. 1B shows the incision and the size and location of the bone defect. The latter is extended laterally as far as the mastoid cells will permit. If extensive pneumatization of the mastoid is present it may be necessary to open a number of cells which are then covered with pieces of hampered muscle. If several large cells have been opened it may be prudent to postpone opening the dura for 10 to 12 days and thus leave the rest of the procedure for a second session. After the bone removal has been completed, the table is rotated around its horizontal axis to the left in a right-sided tumor, and to the right in a tumor of the left side. The posterior surface of the cerebellum on the side of the tumor is thus brought into an almost horizontal position and the approach to the tumor will be in a vertical plane.

The dura is opened in stellate fashion and the cerebellum gently elevated, exposing the tumor (Fig. 1C). Resection of the lateral third of the cerebellar hemisphere is rarely necessary for a good exposure of the tumor. The ninth, tenth, and eleventh cranial nerves are identified but left undisturbed for the time being and protected by a piece of cotton. In the operation from which this drawing was made, the tumor projected below the ninth nerve which was slightly elevated by the lesion; but usually the ninth nerve lies below the inferior pole of the tumor.

Blood vessels visible on the exposed surface of the tumor are coagulated and the capsule of the lesion incised.

The contents of the tumor are removed with a fairly large long-handled spoon (Fig. 1D). As this procedure usually is accompanied by fairly brisk hemorrhage, time is saved by reducing the blood pressure to about 60 or 70 until the intracapsular part of the procedure is finished. When sufficient neoplastic tissue has been removed, the ninth, tenth, and eleventh nerves become slack and can then be dissected free from the capsule of the tumor. They should then again be protected by a piece of cotton.

When the intracapsular removal has been carried as far as appears possible and safe, the remaining shell of the tumor is compressed with a spatula and pushed away from the ninth, tenth, and eleventh nerves (Fig. 1E). During this part of the procedure one or more small arteries may be seen entering the tumor near the lower pole; these should be clipped and divided as close to the tumor as possible. When this has been accomplished a search is made for the facial nerve. This nerve is most easily identified as it runs as a flat band on the lateral side of the pons. It can then be followed along the inferior surface of the tumor. The nerve usually disappears about half way between the pons and the porus as it curves around the tumor in order to enter the porus, in the lower part of the upper anterior quadrant. In small tumors the nerve may be followed all the way to the porus. The nerve is somewhat adherent to the capsule of the tumor and must be dissected free with great care. Occasionally the nerve is separated from the tumor by a thin sheath of arachnoid; this of course makes dissection of the nerve much easier.

In larger tumors the facial nerve cannot be followed all the way and it becomes necessary to divide the stalk of the tumor anchored in the porus (Fig. 1F). Before this is done the superior pole must be partially mobilized and the petrosal vein which runs between the tentorium and the superior surface of the tumor coagulated. The actual division of the stalk is best done slightly lateral to the porus with blunt dissectors, occasionally using a knife when necessary. The dissection should be kept as close as possible to the capsule of the tumor. One must constantly be looking for the facial nerve where it enters the porus.

If the porus is only slightly or moderately enlarged it may not be necessary to divide the stalk of the tumor; instead, with the help of a blunt dissector, the neoplastic tissue