A CLINICAL EXPERIENCE WITH MENINGIOMAS OF THE BRAIN*

FRANCIS C. GRANT, M.D.†
Philadelphia, Pennsylvania

(Received for publication June 3, 1954)

From January 1, 1931 to January 1, 1952, 1882 tumors have been verified on the neurosurgical service at the University and Postgraduate Hospitals of the University of Pennsylvania. In this group 219 were meningiomas, or 12 per cent. The purpose of the present report is to stress the problems involved in the surgical management of these tumors.

A meningioma is a benign tumor, which, if it can be completely extirpated together with its meningeal attachment, will not recur. Consequently, from the beginning, the operator has two ends in view: to remove the tumor completely and to remove it in such a fashion that the patient recovers and lives his life with a minimal neurologic deficit. This is the objective. Its attainment depends on a number of factors not under the surgeon's control: the size, and particularly the position, of the tumor and the neurologic deficit revealed by the patient prior to operation. And since these tumors grow so slowly, the clinical picture is no indication of the actual size of the tumor. These tumors are always much larger than the neurologic symptoms indicate.

Diagnosis and localization of a meningioma are not difficult. A careful history and neurologic examination, roentgen-ray films, ventriculography and arteriography will not only place the tumor correctly within the cranial cavity but will, in the majority of instances, determine the fact that the tumor is a meningioma. Arteriography should be avoided whenever possible. The information desired can be obtained just as satisfactorily and with less risk by ventriculography, except in an occasional subfrontal tumor. Following arteriography, the diodrast can diffuse out into the neck or produce a cerebrovascular spasm with disastrous results. Inasmuch as every patient harboring a tumor should have the ventricles tapped pre- and postoperatively for relief of pressure, ventriculography is the method of choice for the localization of silent lesions. In only 6 instances in this series was the tumor not exposed, and in 4 of these, the incision was correctly placed but the tumor lay too deep for identification.

Anesthesia is important. The modern anesthetist is all for endotracheal anesthesia. But in all cases of supratentorial lesions, local anesthesia, plus morphine, pentothal, or the barbiturates by vein if the patient becomes rest-

† 3400 Spruce Street, Philadelphia 4, Pennsylvania.
less, is much safer. No matter how deftly an endotracheal tube is introduced, it remains in place for at least three hours. Edema of pharynx and larynx is sure to result with possible pulmonary complication three or four days later. In cases of subtentorial lesions, in which a clear airway is essential, an endotracheal tube is imperative. Space in the posterior fossa is at a premium even after relief of pressure by ventricular tap. Endotracheal anesthesia, while not entirely satisfactory, assures the operator that increased pressure from respiratory difficulties will be reduced to a minimum. Furthermore, postoperative tracheotomy has been done whenever necessary. This procedure has saved a number of desperately sick patients and is heartily recommended.

Whether the operation is carried out in the erect or the prone position depends on the facilities and the operator's training. The erect position, especially with subtentorial lesions, may afford better drainage of cerebrospinal fluid and more adequate exposure through smaller fields. But if a persistent drop in blood pressure necessitates a change in position, this may be difficult to accomplish without contamination of the wound. Furthermore, air emboli can occur with the patient erect.

We have had no large experience with the deliberate reduction in blood pressure by bleeding or by depressor drugs in the control of hemorrhage. Apparently, when a skilled and experienced anesthetist is available, this is a reasonably safe and very effective method to use in attacking the vascular and inaccessible subfrontal and subtentorial tumors.

This series of meningiomas has been divided arbitrarily into three groups: the tumors lying over the convexity of the brain along the longitudinal sinus; the tumors at the base of the skull about the olfactory groove, sphenoid or petrous ridges; and those lying subtentorially. The convexity tumors are the most numerous, produce striking symptoms of convulsions, hemiparesis, and sensory disturbances, and present the easiest surgical problem. Every effort should always be made to extirpate completely a tumor in this region. The basilar group are accompanied by relatively little neurologic evidence of their presence, for the most part mental changes, proptosis of one eye, a visual field deficit, or ocular muscle paresis. Local changes in the bone on roentgen-ray studies may be the only evidence of the presence of a subfrontal tumor. Therefore, since these patients are not seriously crippled by the lesion, the attempt at complete removal should not be carried to the point at which the patient suffers more from the surgeon's efforts to remove the tumor than he did from the tumor itself. The subtentorial tumors may give pressure, cranial nerve, and cerebellar symptoms rather promptly. A definite effort should be made to remove these lesions completely, especially if they do not involve the brain stem. The seventh and eighth nerves may be injured but the cerebellar symptoms disappear quickly if pressure is relieved, and remarkably little permanent damage is noted.

The surgical results that have been obtained in these three groups are shown in Tables 1, 2, 3, 4 and 5.