INTRACRANIAL EPIDERMOID AND DERMOID TUMORS*
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The intracranial epidermoid and dermoid tumors (cholesteatomas, or pearly tumors) are uncommon, benign and grow slowly. The location of the tumor in some instances may preclude complete removal, but even partial excision will often result in prolonged or permanent relief of signs and symptoms. The neurological disabilities caused by these tumors are often relatively slight.

We reviewed the cases of patients at the University of California Medical Center and the Veterans’ Administration Hospital, San Francisco, who had intracranial epidermoid and dermoid tumors and who were treated during the past 20 years. (One patient was first treated 25 years ago.) Lesions that involved the skull exclusively were not included in this review.

GENERAL CONSIDERATIONS

Sixteen patients had intracranial epidermoid and 2 had dermoid tumors. In 1 additional case there was insufficient tissue from the capsule of the tumor to establish the diagnosis with certainty, but the lesion was probably an epidermoid tumor.

The age and sex of the patients and the duration of symptoms are listed in Table 1. The symptoms and signs varied, of course, with the location of the lesion and were not particularly different from those of other tumors in the same location, except for the relatively long duration of symptoms. Calcification in the lesion was noted on plain roentgenograms of the skull in 7 cases. In 1 patient with an epidermoid in the cerebellopontine angle, erosion of the petrous pyramid was present.

Localization of the tumor was accomplished by pneumoencephalography or ventriculography in 9 cases and by carotid angiography in 1 case. In 1 instance a tumor in the posterior fossa that extended into the upper cervical spinal region was diagnosed by myelography. Protein concentration of the spinal fluid was recorded in 7 cases. It was slightly elevated in 2 patients (71 and 59 mg. per cent) and within normal range in the others.

Complete removal of the tumor capsule should be the goal of operative attack on these lesions. However, the capsule is generally adherent to the adjacent brain and attempted total removal may result in severe disability.

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or operative mortality, depending upon the location of the tumor. Several authors\textsuperscript{3,4,6} have noted that the surgeon often must be content with incomplete removal of the lesion. Olivecrona\textsuperscript{5} stated: "From our experiences with cholesteatomas in this and other locations . . . recurrences are rare even if most of the capsule is left behind."

Results in the present series will be described under the various specific locations of the tumors.

**LOCATIONS OF TUMORS**

The locations of the tumors are summarized in Table 2.

*Third Ventricle:* 5 cases.* The ages of these patients at admission were 4, 10, 33, 54 and 62 years. Three had evidence of increased intracranial pressure. Calcification within the tumor was noted in the roentgenogram in 3 cases. Operative removal of the tumor was incomplete in all the patients. There was 1 postoperative death. One patient was alive and well 11 years after operation. Three patients died 6 weeks, 2 years and 8 years postoperatively. The deaths occurred elsewhere but are presumed to have been caused by further growth of the tumor.

The patient who died in the hospital following partial removal of the tumor had had a ventriculocisternostomy and irradiation therapy 20 months

**TABLE 2**

<table>
<thead>
<tr>
<th>Location of tumors</th>
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<tbody>
<tr>
<td>Third ventricle</td>
<td>5</td>
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<tr>
<td>Temporal lobe</td>
<td>5</td>
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<tr>
<td>Parasagittal region</td>
<td>3</td>
</tr>
<tr>
<td>Posterior fossa, midline</td>
<td>3</td>
</tr>
<tr>
<td>Convexity of cerebral sphere</td>
<td>2</td>
</tr>
<tr>
<td>Cerebellopontine angle</td>
<td>1</td>
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* There were differences of opinion about the nature of the lesion in 3 instances. Some observers believed that the microscopic appearance of the walls of the cysts was consistent with a diagnosis of craniopharyngioma, although others maintained that these were epidermoid cysts. Grossly, the tumors appeared to be entirely within the third ventricle and were thought to be compatible with a diagnosis of epidermoid cyst.
previously without apparent effect on the tumor. (This case was reported previously by Boldrey et al.)

Temporal Lobe: 5 cases. The ages of these patients were 23, 28, 34, 45 and 50 years. Four patients had evidence of increased intracranial pressure and 2 had roentgenological evidence of calcification within the tumor. Mental changes, headaches, or both, were reported in all patients; convulsive seizures were reported in 3.

One patient, whose tumor had ruptured into the ventricular system preoperatively, died shortly after the operation. The tumor in this instance lay under the mesial portion of the temporal lobe. Removal of the tumor was thought to have been complete in 3 of the 4 remaining cases. These 4 patients were known to be living, without evidence of recurrence, 3, 6, 7 and 8 years postoperatively. All had convulsive seizures.

The tumors in this location tend to reach a large size before they are detected (Fig. 1). The exact site of origin is often difficult to ascertain at the time of operation. The lesions may arise in the basotemporal region, Sylvian fissure or “paratrigeminal area.” Extensions of the tumor may occur into the temporal lobe, anterior fossa and suprachiasmal region.

Parasagittal: 3 cases. The literature contains few reports of epidermoid tumors in this location. In the 3 cases of the present series the tumors were frontal or parietal and occupied a position identical with parasagittal menin-
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The ages of these patients were 24, 42 and 63 years. (The 63-year-old man had been having convulsions for 30 years.) None of the patients had evidence of increased intracranial pressure. The tumor was partially calcified in 1 instance. All patients had had convulsive seizures. There were no postoperative deaths. Removal of the tumor was thought to have been complete in 2 of these patients. No follow-up observation was made on 1 of the patients; the other 2 were alive without evidence of recurrence, 6 months and 6 years postoperatively.

*Posterior Fossa, Midline*: 3 cases. The ages of these patients were 5, 21 and 62 years. In 2 patients a congenital dermal sinus extended from the surface to the intracranial tumor; in one of the cysts the wall of the tumor was almost replaced by acute and chronic inflammatory changes. One patient had platybasia and fusion of the cervical vertebrae (Klippel-Feil syndrome). There was calcification in the tumor in 1 instance.

Two patients had clinical evidence of increased intracranial pressure and signs suggesting a lesion in the posterior fossa. In the third patient, papilledema was not present; clinical signs pointed to a lesion of the upper cervical spinal cord.

The tumor was removed without opening it in 1 patient, who is living without evidence of recurrence 5 1/2 years postoperatively. The tumor was incompletely removed in 1 patient, who had an early recurrence of increased
intracranial pressure and died in spite of re-exploration and ventriculocisternostomy. In the third patient the cyst, which had become infected via the dermal sinus, was opened in the process of removal; this caused a progressive, adhesive process about the cerebellum and brain stem. Several cerebrospinal fluid shunts were performed which finally relieved the increased intracranial pressure, but there was residual clinical evidence of severe damage to the brain stem.

In all 3 patients the tumor lay in the midline, displacing the vermis upward and the tonsils laterally; there was variable extension around the medulla and through the foramen magnum.

Convexity of Cerebral Hemisphere: 2 cases. The patients were 26 and 38 years of age. The tumors were located in the parietotemporal and frontal regions. In the latter case a cyst had been removed from the scalp overlying the tumor 10 years prior to craniotomy. The bone was thinned out over the tumor; there was a defect in the dura mater but no tract was seen. Both patients had had seizures and headaches. Neither tumor was calcified but bony erosion was noted on roentgenograms in the patient with the frontal tumor. In neither case was there evidence of increased intracranial pressure. Both patients survived complete removal of the tumor without complications. Follow-up information was not available in either case.

Cerebellopontine Angle: 1 case. A 36-year-old man had had headaches and ataxia for 2 years prior to admission. The signs were those of a lesion in the cerebellopontine angle. There was roentgenological evidence of erosion of the tip of the petrous pyramid, but no calcification. No evidence of increased intracranial pressure was noted. The bulk of the tumor was removed but the intimate attachment of the capsule to the brain stem precluded total removal. Irradiation therapy was given but after a short period of improvement symptoms recurred. Re-operation was performed on two occasions but no definite tumor was visualized. The brain stem was seen to be displaced dorsally. The patient died 7 years after the first operation, presumably from extension of the tumor anterior to the brain stem.

Both Olivecrona and Rivilla have reported that patients with cholesteatomas in the cerebellopontine angle usually have trigeminal neuralgia as the presenting symptom. The patient reported here noted a burning sensation in his face on the side of the tumor, but this was not similar to trigeminal neuralgia.

SUMMARY

Nineteen cases of intracranial epidermoid and dermoid tumor treated at the University of California Medical Center and the Veterans' Administration Hospital, San Francisco, were reviewed. The average age of the patients was 35 years. There were 11 males and 8 females in the series.

Five of the tumors were located in the third ventricle; 5 in the temporal fossa; 3 in the parasagittal region; 3 in the midline posterior fossa; 2 over the
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convexity of the cerebral hemispheres; and 1 in the cerebellopontine angle. The average duration of symptoms was 5 years.

The results of partial removal of these tumors when they lay within the third ventricle or in the midline of the posterior fossa were generally poor. Results of treatment of the tumors involving the cerebral hemispheres were generally good.

REFERENCES