SUBEPENDYMAL GLOMERATE ASTROCYTOMA

REPORT OF TWO CASES

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The purpose of this paper is to report two cases of an unusual neoplasm of the brain. This lesion has been designated "subependymal glomerate astrocytoma" to differentiate it from the more aggressive astrocytoma of similar location and gross characteristics termed "ependymal granule type of astrocytoma."

Recognition of the former type of tumor during an operative procedure may be of great importance in reference to the method of treatment. Also recognition and study of this lesion in postmortem material may in time add to our general information concerning gliomas. It is therefore believed that attention should be directed toward this neoplasm.

REPORT OF CASES*

Case 1. Two hours prior to admission a 50-year-old white man complained of dizziness and sudden severe pain in the throat, chest, and right shoulder. The pain continued and was severe. An electrocardiogram showed evidence of myocardial ischemia. Roentgenogram of the chest revealed findings compatible with the diagnosis of dissecting aneurysm. A history of prior disease of the nervous system was not elicited. The patient died suddenly within 24 hours.

Autopsy disclosed a dissecting aneurysm of the aorta. The fixed brain weighed 1,350 gm. Externally it showed mild edema and mild tentorial herniation of the right uncus and hippocampus, with a lesser degree on the left. There was a moderate cerebellar pressure cone. The basilar artery showed moderately severe arteriosclerosis. Serial coronal sections of the brain revealed no abnormalities except for the fourth ventricle. This was distended and filled by a firm, solid, greyish-white lobulated mass, $2.0 \times 2.0 \times 4.0$ cm., attached to the floor. It had elevated the midline cerebellar structures and flattened the pons and medulla (Fig. 1).

Microscopic Examination. Sections stained with hematoxylin and eosin showed clusters of small uniform nuclei resembling astrocytes (Figs. 2 and 3). Phosphotungstic acid-hematoxylin stains revealed the cell clusters to be surrounded, lobular fashion, by dense astrocytic fibers, which were also arranged circumferentially about blood vessels. Some fibers apparently were attached to the walls of the vessels and at right angles. The vessels were prominent and plentiful. Some contained lipid-filled histiocytes and others revealed hyalinization of the wall. There was no endothelial proliferation. Occasional small cystic areas were found. There was sharp demarcation between the tumor and the underlying parenchyma, which contained normal-appearing ganglion cells (Fig. 4).

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Fig. 1. Low-power photomicrograph of tumor showing attachment to floor of fourth ventricle. Phosphotungstic acid-hematoxylin stain.

Fig. 2. Low-power photomicrograph showing general topography of tumor.
Case 2. A 66-year-old white man gave a history of repeated episodes of congestive heart failure for the previous 3 years. In addition, he had multiple lipomas of the trunk and extremities and a mass in the right apical region, diagnosed as a “Pancoast tumor.” He was admitted to the hospital April 3, 1957 for myocardial failure and died April 17, 1957.

Autopsy revealed emaciation and decubitus ulcers. There was bilateral hydrothorax and ascites. The heart weighed 420 gm. There was marked arteriosclerosis of the aorta.

The right lung weighed 800 gm., and the apical region contained a bronchogenic carcinoma 2 cm. in diameter. The rib contiguous to this area was eroded by tumor. The remaining organs except for the brain revealed no pertinent findings. The brain weighed 1,260 gm. unfixed. After fixation coronal sectioning revealed no alterations except for a firm greyish-white nodule arising from the floor of the fourth ventricle. It measured 0.4×0.5 cm.

Microscopic Examination. The histological appearance of the tumor was similar to that in Case 1.

DISCUSSION

Differentiation of the ependymal granule type of astrocytoma and the subependymal glomerate astrocytoma appears important because of the features of circumscription and superficiality of the subependymal glomer-
ate astrocytoma with the implication that it may be removed without sacrifice of contiguous tissue. In fact the microscopic features show a very loose attachment, which makes it appear that the tumor might be gently peeled away from its bed. This is in contradistinction to the ependymal granule type of astrocytoma that cannot be differentiated histologically from astrocytomas; these permeate the parenchyma and cannot be removed without damage to the contiguous structures. These two tumors may be easily distinguished microscopically and may allow for more conservative management of the glomerate astrocytoma.

Scheinker recognized these tumors as a histological entity and named them “subependymomas.” The origin is thought to be from clusters of fibrillary astrocytes found in the subependymal plate.

Boykin et al. tabulated 21 cases recorded in the literature including 9 new cases of this tumor and preferred the designation herein employed.

Of the 21 cases, including the 9 cases by Boykin et al., 16 were reported in sufficient detail for analysis. Five were in women and 10 in men. The patient’s sex was not recorded in 1 case. The patients’ ages ranged from 24 to 56 years. Eleven tumors produced clinical symptoms, and 4 were found incidentally at autopsy. Nine were located in the fourth ventricle. In 1 patient there were two tumors without symptoms. Three others of the nine had no
symptoms. Five tumors arose in the lateral ventricle, 4 from the septum pellucidum, and another probably from that structure. Two arose in the right ventricle, 2 in the left ventricle, and 2 in the spinal cord. The size ranged from 1.5 to 4×6 cm. in the fourth ventricle and 4.5×6 cm. in the lateral ventricles. Roentgenograms revealed calcifications in 1 tumor.

More recently Chason² has reported 36 neoplasms found in 19 patients. He preferred the designation "subependymal mixed glioma" because the tumors in 5 patients contained neoplastic ependymal cells and astrocytes. Other reasons for this designation include the fact that these neoplasms originate in subependymal areas containing mixed cell rests and that often gliomas are composed of multiple types of cells. It would appear, however, that the latter point could be used as an argument for calling all gliomas mixed.

In 10 patients there was no clinical evidence of disease of the central nervous system, although time did not allow complete evaluation because the period before death was insufficient. Disease of the central nervous system was not suspected in the remainder.

Microscopic studies revealed neoplasms similar to those described previously by Boykin et al. and others in all but 5 patients. The tumors in these 5 contained either intracytoplasmic granules or vacuoles and cells that occasionally demonstrated a rosette-like arrangement. The latter features formed the histological basis for the designation "mixed glioma."

This type of cell and arrangement were not demonstrated in the tumors recorded herein.

All of the tumors reported by Chason were in men and all arose in the fourth ventricle or its recesses except in 1 case.

The 2 cases in the present report are similar to the cases tabulated by Boykin et al., Chason, Scheinker, and others. Both tumors occurred in the fourth ventricle, were asymptomatic, found incidentally at autopsy, measured 2×2×4 cm. and 0.4×0.5 cm., and occurred in 50- and 66-year-old men respectively.

Awareness of this tumor should enable one to diagnose the lesion readily, particularly at autopsy; however, the microscopic appearance of rather uniform clusters of astrocytes should suggest the diagnosis on frozen section during an operative procedure.

SUMMARY

Two cases of a rarely described subependymal glomerate astrocytoma are reported. The importance of recognition and differentiation of this tumor from the more deeply penetrating type of astrocytomas is emphasized in view of its more favorable anatomical location and possible surgical removal.

REFERENCES