CEREBRAL ASTROCYTOMAS IN CHILDHOOD
A CLINICAL STUDY

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The relatively benign form of cerebral astrocytoma is found only infrequently in childhood; thus Ingraham and Matson12 were able to describe only 15 examples of the lesion, while French7 found only 10 such cases in his series of brain tumors in childhood. Others1,5,8,14,21 confirmed the scarcity of the neoplasm. The relative rarity of this growth is even more remarkable considering the frequent occurrence of its histological equivalent in the cerebellum of children and the cerebrum of adults. The often proposed congenital origin of cerebellar astrocytomas cannot account for the difference, since the arguments favoring a congenital origin apply equally to the supra- and infratentorial form of astrocytoma.

The purpose of this communication is to describe 20 cases of histologically confirmed, relatively benign astrocytomas in childhood, pointing out their remarkably good prognosis as compared with the outlook occasioned by similar lesions in the adult. The series was confined to patients up to the age of 15 years, a commonly accepted limit of childhood.

The case histories forming the subject of this paper were obtained from the records of the National Hospital for Nervous Diseases, Queen Square, London, and The Children's Hospital, Great Ormond St., London; the records of the Methodist and Hermann Hospitals, Houston, Texas; and private records by the kind courtesy of Mr. Wylie McKissock, O.B.E., F.R.C.S., James Greenwood, Jr., M.D., J. Randolph Jones, M.D., and George J. Ehni, M.D.

Etiology. In 1895 Stroebe23 described cysts lined with ciliated epithelium in cerebral gliomas and stated that the epithelial cells probably originated from primitive neural-canal lining cells, thus relating gliomas to a developmental defect. He cited Buchholz1 as a source of a similar histological observation. The same finding was mentioned also by Storch,22 who thought that the lining cells were rests originally cut off from the ventricular system but accepted the possibility that glioma cells might resume an ependymal form. Some years later Saxer,19 who had seen such lining cells in gliomatous cavities, firmly proposed that these cells were indeed only altered glioma cells.

Another proponent of the congenital-origin theory, Marburg,14 described ependymal rests in the brain of children, which appeared to have been originally connected with the ventricles of the cerebrum and cerebellum. Since he also found ependyma-lined cavities in cerebral gliomas he concluded that gliomas arose around these ependymal rests and that ependyma-lined cysts could develop from them even without tumor formation.

The above statements were but a small part of a very considerable discussion concerning the possible congenital origin of astrocytomas. Whether such theories were justified or not, there appears to be a striking difference in prognosis between these tumors in childhood, and in adult life.

Incidence. The comparative rarity of the tumor is illustrated by the small collections of cases in the literature already mentioned. In our experience8 the tumor represents less than 9 per cent of the relatively benign cerebral astrocytomas of all age groups. Table 1 shows that very few of the patients presented themselves before the age of 5 years but there is of course little significance in computing a mean-age figure, since an arbitrary age limit of 15 years is used. Of the 20 patients only 6 were male which is rather remarkable in view

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of the slight preponderance of males among those with astrocytomas generally. However, the number of cases admittedly is small.

**Clinical Features.** The mean length of history in our cases was 9 months, a figure notably different from the one seen in a large series of cerebral astrocytomas of all ages.

The over-all picture in children showed few distinctive characteristics when compared with similar lesions in adults. Headache, vomiting and epilepsy were the most common complaints. It was noted that vomiting occurred with greater facility in children than in adults suffering from similar intracranial tumors. Epilepsy, both major and minor, whenever it occurred, was one of the earliest symptoms. Diplopia or a squint was noted in 6 cases and appeared to be a rather frequent symptom in childhood while being relatively infrequent with similar tumors in adults. Paresis, drowsiness, impairment of vision, and ataxia were other features described.

On examination the most frequent sign was papilledema; this was present rather more consistently (80 per cent) than in adults...