THE INCIDENCE OF INTERHEMISPHERIC EXTENSION OF GLIOBLASTOMA MULTIFORME THROUGH THE CORPUS CALLOSUM

HARRY P. MAXWELL, M.D.*

Department of Neurology and Neurological Surgery, University of Illinois College of Medicine, and the Illinois Neuropsychiatric Institute, Chicago, Illinois

(Received for publication August 20, 1945)

MODERN ADVANCES in neurological surgery permit the surgeon to successfully remove enormous amounts of brain tissue. As a result, the patients with malignant brain tumors have oftentimes been subjected to extensive resections, lobectomies, and even hemispherectomies, in the hope that a complete excision of the gross tumor and adjacent microscopically invaded tissue would effect a cure. Such operations for glioblastoma multiforme are almost always ultimate failures (disregarding the immediate surgical mortality) because a high percentage of glioblastomas extend into the opposite hemisphere through the corpus callosum, and there is therefore recurrence.

At the suggestion of Dr. Eric Oldberg, in order properly to evaluate this disheartening prospect, the recent postmortem cases from this clinic have been collected and reviewed. This study disclosed that in 38 consecutive cases of glioblastoma multiforme of the cerebral hemispheres (pathological diagnoses by Dr. Percival Bailey) autopsied since January, 1941, 31 (75 per cent) had definite gross interhemispheric extension through the corpus callosum, visible to the naked eye.

Of the 38, the main tumor mass was found to be in the right hemisphere in 14 cases, in the left hemisphere in 11 and to be centrally located in the corpus callosum in 3 cases. Of the remaining 7, in 2 cases (1 parietal and 1 temporal) there was questionable extension, and in 5 cases (1 frontal, 3 temporal and 1 parieto-occipital) there was no gross callosal invasion. Sections of the corpus callosum in these seven cases were not examined microscopically, however, since this study is concerned only with extensions that would be visible to the surgeon, were he able to explore the corpus callosum.

The location of the main tumor mass in the 21 cases that showed gross interhemispheric connections was divided as follows: 8 frontal, 7 parietal, 2 central, 1 occipital and 3 callosal. The age, sex, duration of history and findings in all cases were characteristic of cerebral glioblastoma multiforme. The occurrence and extent of involvement of the opposite hemisphere could rarely be anticipated antemortem from clinical findings except in the three cases of gliomas of the corpus callosum. These were readily noted on ventriculography. Figs. 1, 2 and 3 demonstrate typical examples of involvement in the anterior, middle and posterior portions of the corpus callosum.

* 208 East Wisconsin Avenue, Milwaukee, Wisconsin.
The gross directional manner of extension of glioblastomas is influenced by the course of large fiber pathways in the brain.\textsuperscript{1,3} Thus, the tumors arising lateral to, or above, the corpus callosum are more often found growing into it parallel to the fibers and thus crossing to the opposite side, the corpus callosum being a broad commissure between the frontal, parietal and oc-