Development of Glioblastoma Multiforme

Dear OncoLink "Ask The Experts,"

Our 16-year-old son died after being diagnosed with an astrocytoma; however, the autopsy confirmed GBM, or Glioblastoma multiforme. His only symptoms were headaches. Do GBM tumors start out as astrocytomas and then progress to GBM? How long would it take an astrocytoma to form into a GBM?

Christopher Dolinsky, MD, Assistant Chief Resident in the Department of Radiation Oncology at the Hospital of the University of Pennsylvania, responds:

Glioblastoma multiforme (GBM) represents the most aggressive form of astrocytomas, which are a spectrum of tumors arising from cells called astrocytes. Hence, GBM is actually just one subtype of astrocytoma, also known as a Grade 4 astrocytoma. Incidentally, astrocytes are actually one of many types of "glial cells", or supporting cells of the central nervous system. All cancers involving glial cells are thus collectively known as "gliomas". Put another way, GBM's are listed under the larger general category of astrocytomas, which in turn are listed under the larger heading of gliomas.

GBM's are the most common type of primary brain tumor; metastases to brain from other primary tumor sites remain the most common type of brain cancer overall. As mentioned above, GBM's are considered Grade 4 astrocytomas by the World Health Organization (WHO) grading system. GBMs can actually develop from lower grade gliomas, like grade 2 or grade 3 astrocytomas. GBMs can also form directly from normal brain cells (astrocytes) without going through lower grades. The particular pattern of genetic mutations in the cells ultimately dictates which grade of tumor will develop. It is more common for GBMs to develop from lower grade tumors in younger patients; however, it is not the kind of thing that happens over a short time. If there is a change in the diagnosis within a short time, it is more likely that the first diagnosis was incorrect. This is often the case because initial biopsies, in the interest of safety, may be relatively small in size and thus contain small amounts of tumor to examine under a microscope. The pathologist who makes the diagnosis may not see all of the features present in order to classify something as a GBM. However, at autopsy, the entire specimen can be examined and then a more accurate diagnosis can be obtained.

9/16/07
No