Brain Case 1
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
January 19, 2007

Clinical Information: Right Temporal Lobe Tumor

Final Diagnosis:
A. Hippocampal tumor, biopsy: Glioblastoma multiforme, WHO grade IV
B. Right temporal lobe, resection: Infiltrating astrocytoma with extensive cortical spread
C. Additional hippocampal tissue: Glioblastoma multiforme, WHO grade IV
D. CUSA contents: Glioblastoma multiforme, WHO grade IV

Comments:
Parts A & C show high-grade astrocytoma with gemistocytic features, including necrosis, endothelial cell proliferation increased mitotic activity and high cellularity, consistent with glioblastoma multiforme. A small cell component is also identified. The temporal lobe and portions of the CUSA show a diffusely infiltrating glioma, without the anaplastic and gemistocytic features seen in A and C. Attempts to characterize this tumor show a lower MIB-1 index in the cortical region (part B) compared to the glioblastoma multiforme region (part C). Vimentin and GFAP show extensive astrocytic differentiation in the glioblastoma multiforme component and less processes in the lower grade cortical region. These changes support the concept of a low-grade astrocytoma with transformation towards a glioblastoma multiforme.

END Brain Case 1

Brain Case 2
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
October 7, 2007

Gross Examination:
Three specimens received:

A. Cerebellar tumor
B. Cerebellar tumor
C. CUSA contents

Microscopic Examination:
The following slides have been examined by standard microscopy. 8 hematoxylin and eosin (two levels each of 4 blocks), and one set (two slides of a frozen section). The diagnostic encompasses the microscopic description of slides.

Electron Microscopic Study:
Portion of the posterior fossa mass is processed by electron microscopic study. Ultrastructurally, the cellular tumor is made up of sheets of rather uniform polygonal cells with moderate pleomorphic nuclei with occasional prominent nucleoli. Moderate cytoplasmic organelles include mitochondria and occasional lysosomal granules and rather prominent free ribosomes. No laminated cell membranes are noted. None of the cells contain typical glial fibrils. No neuroendocrine secretory granules are noted. The ultrastructural features are not specific for any cell line.

Final Diagnosis:
A - C. Cerebellar tumor (posterior fossa craniotomy with resection of the cerebellar tumor). High grade neuroepithelial tumor, consistent with medulloblastoma.

Comment:
The immunohistochemical staining pattern is supportive of the light microscopy diagnosis of high grade neuroepithelial tumor, consistent with medulloblastoma.

END Brain Case 2

Brain Case 3
PATIENT HISTORY

Patient History
03/03/2008

This is a 7-year-old boy with a known brain stem glioma diagnosed July 1, 2007 who has been treated with chemotherapy. On his followup imaging, he was noted to have a new supratentorial lesion in the area of the fornix and septum pellucidum. After extensive discussion with oncology server and family, it was decided that we should proceed with brain biopsy to determine the nature of this lesion.

Brain Case 3
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
08/30/2008

Clinical History: The patient has had a previously treated brain stem glioma and the current specimen is from a new supratentorial mass with clinical features of malignancy.

Specimen: Stereotactic biopsy brain tumor

Immunohistochemical stains are performed, with appropriately reactive controls. The tumor cells stain positively for glial fibrillary acidic protein and are nonreactive for neurofilament and synaptophysin, although there is some background staining. A MIB-1 stain shows positivity in approximately 30-40% of tumor cell nuclei.

Final Diagnosis: Brain, biopsy of tumor – high grade astrocytoma consistent with anaplastic astrocytoma

Comment: The histologic and immunohistochemical findings support classification of this tumor as an astrocytoma. Features in favor of anaplasia include the cellularity, mitotic activity, nuclear atypia, and high MIB-1 proliferative activity. Diagnostic features of glioblastoma multiforme are not seen in these small biopsies.

END Brain Case 3

Brain Case 4
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
February 1, 2007

Specimen(s) Submitted As: Tumor - left frontal

GROSS EXAMINATION:
Received in container labeled "tumor," is a Petri dish containing fragments of pink-tan tissue. The tissue measures 1.5 x 1.5 x 0.5 cm. in aggregate. A portion of the tissue is used for frozen section.

FROZEN SECTION DIAGNOSIS:
Brain, (left frontal), biopsy: Astrocytic lesion consistent with low grade astrocytoma.

MICROSCOPIC EXAMINATION:
Sections show brain tissue with gray and white matter. There is increased cellularity. The nuclei are round with indistinct cysoplasm. There is mild nuclear pleomorphism. Significant mitotic activity is not seen. Immunoperoxidase stains show focal tumor staining for GFAP. There are extensive areas non-staining. These areas would be consistent with an oligodendroglioma. The cells that do stain have the features of an astrocytoma. The appearance is consistent with a grade 2 neoplasm.

FINAL DIAGNOSIS:
A&B. Brain, (left frontal), resection: Mixed oligodendroglioma and astrocytoma (oligoastrocytoma), grade 2.

END Brain Case 4

Brain Case 5
PATIENT HISTORY

Patient History
August 21, 2008

This patient is a 40-year-old male with a history of a low grade mixed oligoastrocytoma in the left frontal lobe which was subtotally resected in January 2007. Patient received post-surgical radiation therapy with good result. Recent generalized tonic-clonic seizures with imaging showing a posterior frontal enhancing mass near the site of prior resection. Surgical procedure: Left craniotomy with resection.

Brain Case 5
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
August 22, 2008

Gross Specimen:
A. Received fresh designated “CUSA specimen - brain" is a CUSA container containing 760 ml of red fluid in which small, soft, white fragments are immersed. The fluid is poured off of the tissue, and the tissue is collected into a formalin container. The entire specimen measures approximately 3.0 x 3.0 x 0.5 cm. Representative material is submitted wrapped in cassette A1.

B. Received in formalin designated "left frontal lesion" are ten fragments of soft, light tan to dark tan tissue ranging in size from 0.3 to 1.7 cm and measuring in aggregate 3.0 x 1.5 x 0.5 cm. The entire specimen is submitted in cassettes B1 and B2.

Microscopic:
A and B Sections show a cellular proliferation of pleomorphic astrocytes with interspersed zones of necrosis but lacking a surrounding pseudopalisade of neoplastic nuclei. Exuberant endothelial vascular proliferation and mitotic activity are apparent. In A1 there is a small focus of residual oligo-astrocytoma.

Final Diagnosis:
Glioblastoma multiforme, WHO grade IV

END Brain Case 5

Brain Case 6
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
September 4, 2007

Clinical History: This 22-year-old female presented last weekend with a seizure. An MRI scan showed a large cystic tumor in the right occipital region. This was felt to be a benign glial tumor. Surgical removal was recommended.

Specimen: Frozen & permanent R occipital lobe tumor

Gross Description:
Received in normal saline labeled "right occipital brain tumor" is a 1.9 x 1.4 x 1.0 cm piece of firm, pale, tan-white soft tissue with a smooth external surface. A representative section is submitted for frozen section diagnosis as (FS1) and a scrape prep is done as (SP1) with the interpretation rendered as above. A piece of the tumor is procured for investigational purposes. The remaining tissue is entirely submitted as follows:

Intraoperative Interpretation:
Brain, right occipital frozen section – Benign glial neoplasm, defer to permanent section.

Final Diagnosis:
Brain, right occipital lobe, biopsy: Pleomorphic xanthoastrocytoma (PXA), WHO Grade II of IV. See comment.

Comment:
The tumor has two patterns of proliferation. The central aspect is composed of a cellular, spindled cell proliferation with some tendency toward nuclear pallisading and only focal xanthomatous degenerative changes. The periphery has the typical histologic features of pleomorphic xanthoastrocytoma including multinucleated giant cells and some focal ganglion cell differentiation admixed with xanthomatous degeneration.

Immunohistochemical stains were performed to further characterize the two patterns of growth. These included: Synaptophysin: highlights ganglion cells, otherwise negative. GFAP: positive, faint cytoplasmic, both components. MIB-1: less than 5% nuclei positive (periphery); less than 10% positive nuclei (spindled area).

Features support a single process compatible with two patterns of growth within the PXA. This case has been reviewed by the doctor who concurs with the diagnosis. This case has also been reviewed and discussed at intradepartmental consultation conference.

END Brain Case 6

Brain Case 7
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
May 15, 2007

Clinical Info: Right temporal lobe tumor.

Gross:
There are two specimens, both received in containers labeled with the name. The first of these is received without fixative and is designated as tissue tumor right temporal lobe. This is a 4 cm in aggregate diameter collection of fragments of friable gray hemorrhagic tissue from which a representative portion is taken for frozen section. After this the frozen section remnant is submitted as IFS and multiple additional representative sections are submitted as lA through 1D. Specimen 2 is in formalin and is also designated as tissue right temporal lobe tumor. This is a 3 cm in diameter aggregate of similar hemorrhagic friable tissue fragments, representative sections from which are submitted as 2A through 2C.

Microscopic:
Specimen lA-1D and 2A-2C. The sections from the very generous sized specimens demonstrate extensive brain tumor. There are large areas of necrosis and areas of very high nuclear grade tumor with nuclear pleomorphism, mitotic activity and a prominent pattern of vascular proliferation. There are also areas of lower grade astrocytoma with some gemistocytic astrocytes being identified. Seen in specimen 2 is an area of spindled cell tumor which may represent a sarcomatous component.

Final Dx
Tissue from right temporal lobe tumor: Glioblastoma multiforme

Comments:
The tumor has diagnostic features of glioblastoma multiforme. It also has areas of lower grade astrocytoma and, particularly in specimen 2, a spindled cell area that potentially represents a sarcomatous component as in gliosarcoma.

Addendum Report:
A reticulin stain is performed to further evaluate the possibility of a sarcomatoid component and the reticulin stain very nicely demonstrates reticulin fibers extending between individual cells in the sarcoma-like area particularly on block 2B and by contrast enveloping large clusters but individual cells that compose the normal glioblastoma component. This confirms the diagnosis of gliosarcoma.

END Brain Case 7

Brain Case 8
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
November 4, 2007

Clinical Info:
Patient is a 56 year old woman with a history of seizures, confusion, and imbalance. MRI showed a right temporal lobe tumor (5 x 3 x7 cm) with heterogeneous enhancement.

Gross:
A. Received in formalin designated "tumor" is a 4.0 x 2.5 x 1.0 cm fragment of soft tan-gray tissue. The gray-white junction appears normal and each respective component also appears normal.
B. Received in formalin designated "hippocampus with tumor" is a 3.5 x 2.4 x 1.0 cm piece of soft tan tissue. The outer surface is smooth and glistening. The cut surface is somewhat granular.

Microscopic:
H&E stained sections show a hypercellular, diffusely infiltrative glial neoplasm with variable appearance. At low magnification, most of the tumor has a relatively uniform cell density and nuclear size, suggestive of oligodendroglioma. In some regions, the tumor has variable cell density and cell size, more consistent with astrocytic differentiation. Large areas of geographic necrosis (without peripheral palisading) are present focally. At high magnification, the tumor cells are pleomorphic. Mitotic activity and vascular endothelial proliferation are noted in many parts of the tumor. The tumor invades hippocampus and dentate gyrus.

Immunohistochemistry for GFAP demonstrates scant GFAP immunoreactivity in the oligodendroglial-like tumor cells, and strong GFAP immunoreactivity in the astrocytic-like component. NeuN immunohistochemistry shows that the tumor invades cortex including hippocampus. MIB-1 shows a labeling index of 10-15%.

Final Diagnosis: Mixed anaplastic oligodendroglioma/astrocytoma

Comment:
Much of the tumor has an oligodendroglial "flavor", though there are astrocytic regions that suggest the tumor has a mixed oligo-astrocytoma lineage. The tumor is clearly malignant, as it demonstrates all of the criteria including pleomorphism, mitotic activity, vascular endothelial proliferation, and necrosis.

END Brain Case 8

Brain Case 9
SURGICAL PATHOLOGY REPORT

Surgical Pathology Report
January 23, 2007

Clinical History: Bi-frontal brain tumor

Intraoperative Diagnosis:
Left frontal tumor, biopsy (frozen section): glioma with questionable oligoastrocytoma features. Findings diagnostic of glioblastoma multiforme are not identified.

Gross:
A. Received fresh labeled "left frontal tumor biopsy" is a 0.5 cc aggregate of fragmented friable tissue. The tissue is entirely frozen and submitted.
B. Received fresh labeled "left frontal brain tumor biopsy" is a 0.5 cc aggregate of soft friable tissue, which is entirely submitted.

Final Diagnosis:
Left frontal brain tumor, biopsy – Malignant glioma with oligodendroglioma component.

Comment:
The biopsy from the periphery of the tumor contain mildly to moderately hyper cellular white mater containing a population of relatively small round nuclei suggestive of oligodendroglial differentiation admixed with small numbers of cells with slightly larger angulated nuclei. Vascular proliferation is focally present. Necrosis is not identified. Mitotic figures are present but are not frequent. Marked nuclear pleomorphism is not present. The biopsy from the center of the lesion contains necrotic tumor, which supports the diagnosis of malignant glioma, but does not provided additional cytoarchitectural clues.

GFAP and vimentin stains highlight reactive astrocytes within the neoplasm. The proliferation marker MIB-1 stains 3-5% of nuclei, are diagnostic of oligodendroglioma and astrocytoma.

END Brain Case 9

Brain Case 10
SURGICAL PATHOLOGY REPORT #1

Surgical Pathology Report
December 27, 2007

Clinical History: Eight-year-old female with intraventricular tumor undergoes excision.

Gross Examination:
Specimen 1 is labeled "right intraventricular tumor for EM" and has been sent to the EM lab.
Specimen 2 is labeled "right intraventricular tumor" and consists of multiple spongy hemorrhagic tissue fragments, the largest measuring 6.5 x 3 x 2 cm.

Microscopic Examination:
Sections show proliferation of uniform cells in a perivascular arrangement. There is evidence of blood vessel endothelial hyperplasia.

Final Diagnosis: Brain, ventricle, excision - Consistent with ependymoma

SURGICAL PATHOLOGY REPORT #2

Surgical Pathology Report
November 5, 2011

Clinical History: 12 year-old female with history of right ventricular ependymoma.

Gross Examination:
Specimen received, labeled "right temporal tumor" consists of multiple irregular fragments of tan to white tissue, measuring in aggregate 3 x 3 x 1 cm. Several fragments have a hemorrhagic appearance.

Microscopic Examination:
Sections contain a highly cellular infiltrative glial neoplasm with formation of prominent perineuronal, perivascular and subpial secondary structures. Many cells have astrocytic differentiation with obvious eosinophilic cytoplasm and elongated vesicular nuclei. Other areas show a sheet-like growth pattern reminiscent of oligodendroglioma, but with high cellularity, frequent mitotic figures and nuclear pleomorphism.

Final Diagnosis: Brain, right temporal parietal lobe, excision: Glioblastoma multiforme

Comment:
Sections of the original resection were reviewed and show a well-differentiated ependymoma with distinctive perivascular pseudorosettes. The present neoplasm has a distinctly different appearance from the previously resected tumor. Transformation of ependymomas to glioblastoma multiforme is relatively uncommon.
END Brain Case 10