An Unusual Parotid Mass: Glioblastoma Multiforme and Gliosarcoma

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Objective

To describe a unique presentation of a parotid mass and further our understanding of astrocytomas, glioblastoma multiforme (GBM) versus gliosarcomas, and its metastatic potential in relation to its presentation in the head and neck.

Background

Astrocytomas are central nervous system (CNS) neoplasms, with the immortalized astrocyte as the predominant cell type.

There are multiple grading schemes for astrocytomas based on histopathology but the most accepted is by the WHO.

Grade I – pilocytic
Grade II – low grade (diffuse)
Grade III – anaplastic
Grade IV – glioblastoma multiforme

Low grade astrocytomas have no metastatic potential, and even GBMs have little known metastatic potential – most sources quoting 2%. There have been several theories postulating mechanism of metastasis including hematogenous versus lymphatic spread. Given their low rate of metastasis, when masses appear extra-neurally, the pathology must be questioned or perhaps pathologic transformation.

Methods

Retrospective case report.

Includes a literature review of astrocytomas, Glioblastoma Multiforme (type IV astrocytoma) and other types of glioma with regards to the head and neck, its presentation and manifestation and ability for metastasis.

Patient Case

60-year old otherwise healthy man initially presented to the Neurosurgical team with new onset generalized seizures in 2013. He was found to have a left posterior temporal mass which underwent resection and found to be a WHO grade II astrocytoma.

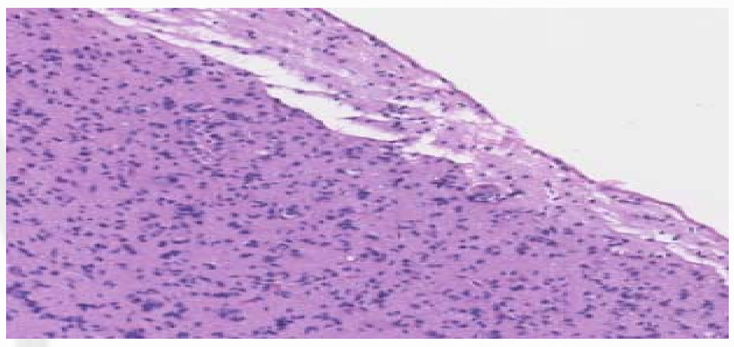

Figure 1. Initial temporal mass histology demonstrating infiltrating astrocytoma. No appreciable mitotic activity, tumor necrosis or microvascular proliferation. IDH-1 (-), low Ki-67 staining (3%)

Patient was observed over the next year and a half with no change. In late 2014, family had started noticing memory, personality and language changes and repeat MRI demonstrated a large enhancing left temporal mass significantly different from previous imaging. This was debulked by Neurosurgery and found to have changed, revealing a WHO grade IV astrocytoma/glibolastoma multiforme.

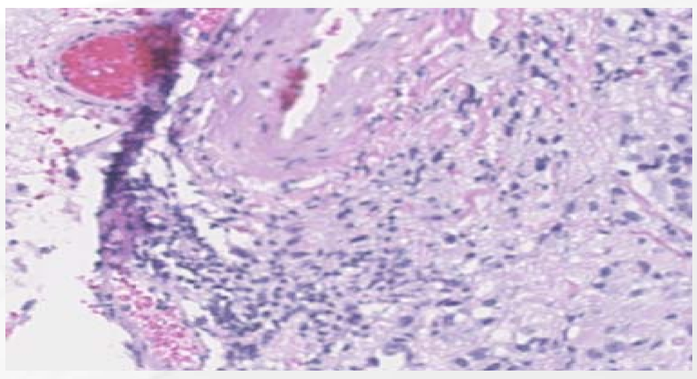

Figure 2. Recurrent mass exhibiting GBM features – increased mitotic activity and angiogenesis. Ki-67 increased (up to 20% focally) and >60% +p53 staining

Patient then underwent concurrent chemotherapy given his new pathology. During radiation patient developed otorrhea and mastoiditis. He then developed pre-auricular nodes and parotid nodes which were biopsied. These revealed glioblastoma multiforme with sarcomatous change despite completion chemotherapy. Patient then enrolled in several trial therapies but succumbed to his disease process in October 2015.

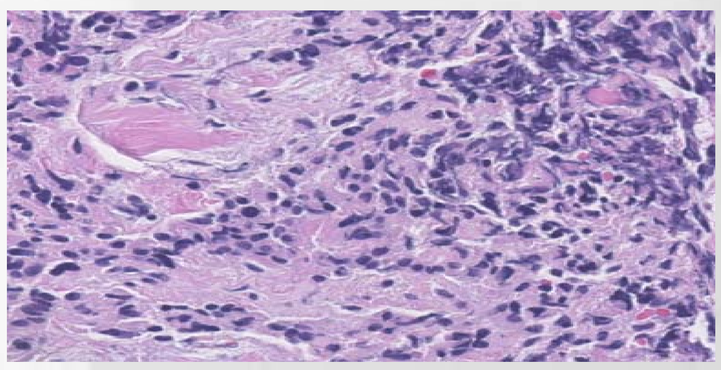

Figure 3. Parotid lymph node histology – small cell and epithelioid features with high mitotic activity and some necrosis. Glial elements with sarcomatous changes.

Discussion

This case report demonstrates significant change in pathology from low-grade to high-grade astrocytoma with accompanying symptomatic change. This transition normally ranges anywhere from 1-10 years for progression of disease.

Although our patient received aggressive chemotherapy and radiation, his disease process progressed. Glioblastoma Multiforme is the most aggressive brain tumor with poor prognosis; patients with GBM have a median survival time of about 14-months.

Yet despite its aggressive nature, GBM alone has an extremely low rate of metastasis outside the CNS. The brain is immunologically and anatomically separated by the blood brain barrier. If extra-neural metastases do occur they occur late in the course of the disease (median of two years) and generally appear after craniotomy, although spontaneous metastases have been reported. In our case, the patient had previous craniotomy and surgical intervention. Our patient's pathology also demonstrated sarcomatous changes which may allow greater ability for this tumor to invade extra-neurally. Several hypotheses have been postulated for metastatic potential including hematologic and lymphatic spread, as well as increased ability due to sarcomatous involvement.

Conclusions

All grades of astrocytomas, including Type IV, Glioblastoma Multiforme have very low metastatic potential. In our patients who present with a new head and neck mass, we as physicians must include metastases in our differential and consider progression and change of pathology in this setting.

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