Case Report

Cerebral astroblastoma

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ABSTRACT

Cerebral astroblastoma is one of the rarest tumors of the central nervous system and its classification, histogenesis, diagnosis and therapeutic management are still being debated. We present a rare case of histopathologically and immunohistochemically diagnosed low grade astroblastoma treated with surgery and postoperative radiotherapy successfully; although the case was low grade. We have given radiation in view of residual disease and unreliability for regular follow-up.

Key words: Astroblastoma, immunohistochemistry, neurosurgery, radiation therapy

INTRODUCTION

Cerebral astroblastoma is one of the rarest tumors of the central nervous system (CNS) and its histological grade, histogenesis, diagnosis and therapeutic management are still being debated. Its incidence has been calculated to be between 0.45% and 2.8% of all primary brain tumors[1] occurring most often in infants and young adults. The prognosis and appropriate treatment is not well understood, as only few individual centers have enough experience with astroblastoma to guide treatment recommendations. We hereby present a case of low grade astroblastoma treated with surgery and postoperative radiotherapy.

CASE REPORT

The case we present here is about a 38-year-old male patient presented with the complaints of weakness and stiffness in neck, left sided sinusitis, occasional vomiting and decreased vision (right > left) of 5 months duration. Bain magnetic resonance imaging (MRI) revealed a left temporo-parietal lesion, of 5.5 × 5.1 × 5 cm, with contrast-enhancement, mixed signal intensity, cystic and solid areas, and intratumoral hemorrhage and perilesional edema. It exerted mass effect on adjacent basal ganglia and displaced the M1/M2 segment of the left middle cerebral artery [Figure 1].

A left pterional craniotomy and tumor debulking was performed. The postoperative period was uneventful histopathology revealed a well-differentiated astroblastoma. Microscopically the tumor was composed of round to oval cells with eosinophilic cytoplasm and round nuclei with granular chromatin with inconspicuous nucleoli arranged compactly or loosely in a perivascular fashion giving radial, papillary, or ribboned profiles. There was no evidence of high grade features such as increased mitosis, nuclear atypia, necrosis or microvascular proliferation. Immunohistochemical stains revealed pancytokeratin, S-100 +ve, epithelial membrane angiocentric glioma focal +ve. Glial fibrillary acidic protein +ve, KI-67 +ve and vimentin +ve [Figure 2].

Postoperative head computerized tomography scan, without contrast revealed a relatively hyperdense area of residual disease in left temporal fossa region measuring 3.5 × 2.5 cm with marked perilesional edema.

In view of the residual lesion patient was planned to receive postoperative radiotherapy to tumor bed region by intensity modulated radiotherapy technique with 6 MV X-rays to a total dose of 48.4 Gy in 22 fractions, 220 cGy per fraction per day.

DISCUSSION

Cerebral astroblastoma is a rare tumor, In the most recent, WHO classification of CNS tumors, astroblastoma is listed

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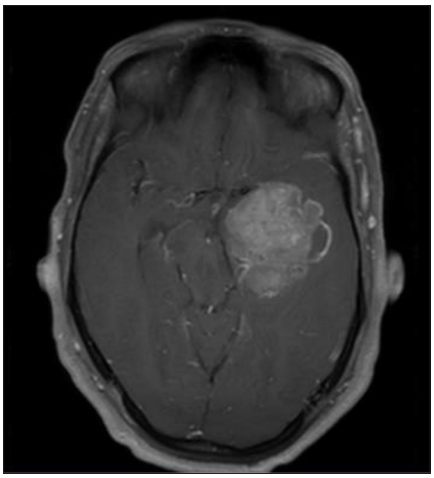

Figure 1: Large mixed signal intensity enhancing, broad based extra axial mass, along the tentorial reflection of the medial aspect of left temporo parietal region with mass effect on adjoining structures with midline shift and transtentorial herniation

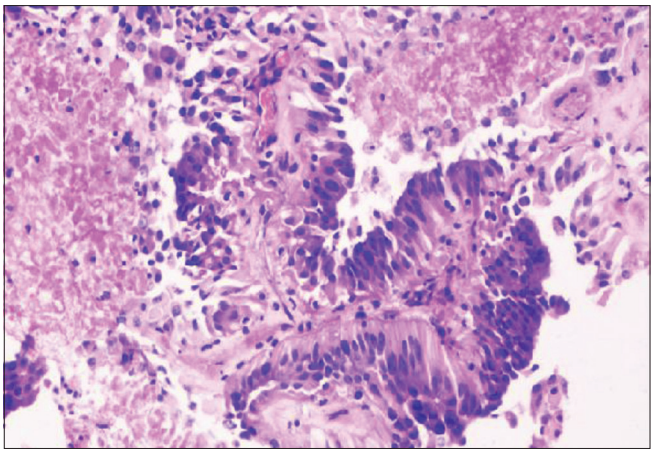

Figure 2: H and E slides at ×20 showing short, stout foot processes. Tumor is composed of round to oval cells with eosinophilic cytoplasm and round nuclei with granular chromatin with inconspicuous nucleoli arranged compactly or loosely in a perivascular fashion giving radial, papillary or ribboned profiles

as a glial neoplasm of uncertain origin.[2] Some authors have proposed that it might originate from embryonic precursor cells transitional between astrocytes and ependymal cells. Other authors have observed that the tumor cells recapitulate the structure of ependymal tanycytes.

Characteristic features for a diagnostic orientation are the young age and the localization of the lesion, since astroblastoma almost always presents as an intra-axial peripheral supratentorial lesion, more frequently in the vicinity of the convexity, and more often involves the frontal and parietal lobes of a single hemisphere, or presents in a medial-sagittal site. Exceptionally, other localizations have been reported.[2]

Histologically, astroblastoma has characteristic perivascular pseudorosettes with short, thick cytoplasmic processes that show blunt ended footplates and are attached to the basal lamina of the blood vessels, frequently by hyalinization. Borders of the lesion more often compress rather than infiltrate the brain parenchyma.[2] This observation is fundamentally important for understanding the behavior of this tumor and in particular, allows its radical surgical excision. Two histological types have been recognized: (1) Differentiated astroblastoma (2) anaplastic astroblastomas show cytological atypias, compact cellularity, perivascular cells with high mitotic rates, and hypertrophy of the vascular endothelium.[1,2]

In practical terms, prognosis may be good and evolutive course may be prolonged if total resection of astroblastoma is done and although, a longer period of follow-up observation is necessary in such cases. This patient presented to us with postoperative residual disease and he was not reliable for regular follow-up, while doing literature search we could not find any case report addressing this situation. In this regard, our treatment decision is unique. In some selected cases, the efficacy of radiotherapy has been widely demonstrated,[2] but mainly with reference to high-grade cases. In fact, the only patient who had been submitted to radiotherapy after biopsy alone was still alive 12 years after diagnosis. Moreover, the only patient with a high-grade astroblastoma who had not been submitted to adjuvant radiotherapy presented the worst prognosis, with a survival time of 1.5 years, and. No evidence of adjuvant chemotherapy has been found in literature.

Sughrue *et al*. performed a systematic comprehensive search of the published English language literature on patients undergoing surgery for astroblastoma to summarize what is known about these tumors, and to provide some framework for future efforts in this area. A total of 62 references met their inclusion criteria, and contained individual patient data on 116 patients with astroblastoma.[3]

Lau *et al*. described the case of a patient with a low-grade lesion removed totally, but not treated by adjuvant radiotherapy, who presented a recurrence 12 months after surgery.[4] Subtotal removal of the recurrence was followed by radiotherapy and although follow-up MRI showed the tumor residue, the disease appeared to be under control. It therefore appears evident that adjuvant radiotherapy is effective and undoubtedly advisable for high-grade lesions that warrant a more aggressive approach. There have been some reports suggesting local relapses in low grade astroblastoma patients not undergoing radiotherapy. We gave radiotherapy in this patient in view of residual disease and unreliability to follow-up.

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