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Glioblastoma multiforme - case presentation and literature review

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Abstract

Glioblastoma multiforme is a most common primary brain tumor with extreme malignancy index. Presented case of 75y.o. patient diagnosed with GBM underwent full treatment : surgery and adjuvant proton-therapy. Despite new therapy development, overall survival time of GBM patients is still unacceptable.

Key words: GBM, Treatment, outcome.

Introduction

Glioblastoma multiforme (glioblastoma multiforme - GBM) is a most common primary malignant carcinoma of brain tissue formed by low-differentiated astrocytes associated with characteristic features such as : variable histological weaving, high activity proliferative index , atypical cells, hyperplasia affecting small vessels with the formation of multiple structures and the presence of spreaded necrotic mass. This is the most common form of gliomas that usually develops in adults over the age of 50. It is typically located above the tent in the area fronto-temporal. [1][2] A characteristic feature of GBM is peculiar, infiltrative the nature of growth, associated with the extent of tumor cells in the nearest major primary, solid tumor mass. This feature determines a high average poor response to surgery and radiation therapy. Several GBM histological subtypes are identified: large cell, small cell, pleomorphic, gemistocytic, with oligodendroglioma component, gliosarcoma and GBM mixed variant . Classic GBM character and histological variants are classified as the highest grade of histological malignancy(WHO grade IV) This cancer represents 12–15% of all brain tumors. Despite advances in neurosurgery, radia- tion and chemotherapy, the average survival rate is only from

12.1 to 14.6 months. Glioblastoma multiforme is characterized by its diverse histological and cellular features. Like other malignant tumours, it is formed in a multistage process of somatic cell transformations, accumulating several genetic disorders.[3,4]

Case presentation

The 75 y.o. female patient had been suffering from severe headache for a month, radiating to her forehead mainly in the morning. Periodically, fresh memory disorders, sensory and motor aphasia. The complaints intensified, the patient suffered from persistent vomiting, which initially associated with dietary error, and intensified with time. There was an episode of unconsciousness. The patient was sent to the Emergency Department. In imaging and computed tomography, edema around the left temporal lobe and its medial part was seen, the edema involved the left hippocampus. The resonance imaging was expanded to confirm the presence of tumor mass within the hippocampal gyrus. The tumor did not intensively intensify after contrast administration. Suspected low-grade glial tumor. The patient was qualified for surgery to remove the tumor. In general anesthesia, the patient's position on the back, the head was turned to the right, the skin was cut arcuately in the left temporal region, the muscles were detached and trepanation holes were drilled. Temporal craniotia was performed,

an arcuate cerebral incision was made, exposing it to the base of the skull, from the access between the lower and middle temporal gyrus with the participation of neuronavigation.After identifying the tumor mass, the tumor-changed tissue was completely removed with an ultrasound knife. Hemostasis was performed with bipolar tweezers and hemostatic agents. The bone flap was restored, the layers were sutured. Subcutaneous drainage and dressing were left. The patient after the surgery was transported to the ICU in order to wake up and assess vital signs in the postoperative period. There were no neuroligical deficits after the procedure. The headaches subsided, speech disorders became less frequent and disappeared over time. The patient was discharged home in good shape. The tumor fragment was submitted for histopathological evaluation. The results of the study indicated Low grade Glioma fibrillar astrocytoma GII. The patient underwent adjuvant protonotherapy and chemotherapy.

Discussion

Glioblastoma Multiforme may resemble a tumor of less malignancy, however, the diagnosis of atypical cell nuclei, high proliferative activity, vascularization with glomerular structure or areas of necrosis determines the diagnosis. Tumor creates the so-called secondary structures, it focuses around nerve cells , vessels or infiltrates nerve bunches.[5] A characteristic feature of GBM is cellular

pleomorphism. GBM can build different low-differential cell forms, giant cells multinucleated, and on the other hand, more mature gemistocytes or fibrous astrocytes. They can be present in the tumor polygonal elements, fat bodies suspended in the cytoplasm of diversified foam, vitreous or a grained structure. [6] In GBM cells, there is expression of the glial marker - acidic fibril protein depending on the maturity degree of tumor cells. Therefore, maturing cells glioblastoma may not show reactivity with antibodies. [7] Histochemical differentiation is also accompanied by immunomodulatory effects of glioblastoma multiforme cells on the immune system. Local immunotolerance procured by the glioblastoma cells promotes rapid tumor growth. With an average time from cognition to death oscillating within a dozen or so months, gbm is considered one of the most aggressive tumors.[8]

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