FLOW CYTOMETRY IN GLIOMATOSIS CEREBRI


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SUMMARY
A 36-year old woman admitted to hospital with a complaint of decrease of sight, personality changes and vomiting. After the confirmation of the diagnosis of gliomatosis cerebri, with imaging methods and pathological examination flow-cytometric study was conducted. Gliomatosis cerebri is rarely seen and up to our knowledge this is the first case who underwent flow-cytometric examination.

Key Words: Flow-cytometry, gliomatosis cerebri, glial fibriller acidic protein

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INTRODUCTION
Diffuse gliomatosis cerebri is a rare brain tumour accompanied by astrocytic or glioblastic cell infiltration. It was first identified by Nevin in 1938 (1). There have been 160 cases covered by mental changes, character changes, seizures, hemiparesis, ataxi, headache, cranial involvement and spinocerebellar deficit constitutes the clinical signs. Epilepsy can be the first symptom in the patients. Progressive

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mental changes can be another typical finding of the illness (2,3,4,5,6). Computerised brain tomography, magnetic resonance imaging and histopathological examination are important in diagnosis. Although, there is a large mass image in gliomatosis cerebri in comparison to other glial tumours, effect of a noticeable mass can not be observed. It is usually in both hemispheres the literature until today (1). Frequently, and in more than one lob localisation (7,8,9,10,11). Literature about the theurapeutic and diagnostic methods are limited. We presented a case of gliomatosis cerebri and evaluated the prognostic value of flow-cytometric examination in gliomatosis cerebri.

CASE REPORT
A 36-year old female patient admitted our clinic with the complaints of personality changes, decrease of vision, nausea and vomiting. Before these complaints, she has been leading a healthy life. In the neurological examination Glasgow Coma Scale was found to be 13, visual field examination revealed concentric narrowing in the right and visual acuity was at the levels of 5/10 and 4/10 on the right and the left respectively. We did not observe motor deficit displaying lateralisation or pathological reflex.
Cerebellar tests were capable. Magnetic resonance imaging revealed a soft tissue mass starting at the right temporo-occipital region and rising up to centrum semiovale infiltrating corpus callosum and extending to the left hemisphere was observed (figure 1). EEG was found normal. Visual evoked potential (VEP) pattern reversal of the right eye was found to be defective. Tibial somatosensoriel evoked potential (SEP) was normal. Serological tests done for lyme disease and AIDS were (-). Stereotactic biopsy was planned but she was underwent surgery because of the development of herniation status. With right temporal craniotomy, right temporal lobectomy was performed and decompression was achieved. Peroperatively no tumoural tissue was detected and that the brain tissue was extremely oedematous. Microscopic evaluation revealed no tumoural tissue and pathological diagnosis was reported as gliosis cerebri. After the operation regression of the herniation status was observed at the computerised tomography.

Figure 1: Magnetic resonance imaging before operation

DISCUSSION
Before the discovery of imaging methods such as computerised tomography and magnetic resonance imaging, postmortem pathological examination was used for diagnosis. In this kind of examinations, as defined by the World Health Organisation, the involvement of at least two lobes by small and fibriller neoplastic glial cells are concerned without including the cellular and central necrotic areas (10). In these examinations although pleomorfism is observed
there is little or no mitotic activity. Diffuse infiltrations involve both white and gray matters but there is less infiltration in gray matter.

*Figure 2: Magnetic resonance imaging after operation*

Involvement in the gray matter is mostly subgyral and it can be defined by white matter.

In some cases demyelination can also be observed (12). Today, the diagnosis is also made by antemortem studies (7). There is no definite mass effect in computerised tomography and magnetic resonance imaging but magnetic resonance imaging compared to computerised tomography is a better examination method. Contrast involvement is very rare. The density of tumoral cell is higher in aras with contrast involvement. However, in some cases there may be ventricular compression due to diffuse swelling (2,8,9,11). In magnetic resonance the proton density and T2A reveals a hyperintense look in images. The involvement is more spread out in white matter, contrast enhancement is unstable and disenhancement can be observed in meningeal structures as well (7,13). Frontal, temporal, parietal and insular regions are involved more frequently. Involvement is usually symmetrical in midline structures.

While the lesion spreads in to pons and mesencephalon, occipital lobe and cerebellum involvement is very rare (10). Interestingly, a correlation between postmortem studies and magnetic resonance imaging is rare. Cranial angiography is usually normal in gliomatosis cerebri cases (2,7,15). While cerebrospinal fluid examination is usually normal, in some cases protein increase has been observed. In the studies of C11-L-Metionin or F18-fludeoxyglucose a good correlation between tumour infiltration and activity involvement has been displayed (16,17).

While studying macroscopically no herniation is observed. In coronal sections a clear widening in white matter is observed in the hemispheres. In most cases talamus also participates. Among the neuronal and axonal structural protected microscopically, diffuse neoplastic proliferation of glial structures is observed (11,18). Abnormal glial tissue spreads out following anatomic ways throughout the white matter. Neoplastic glial cell infiltration displays quite a lot of pleomorfism (2). Mitosis rate varies in different cases (2,19,20). Usually no vein invasion, vascular proliferation and necrosis is observed (2,18,19,20). Destruction of myelin may have been increased at a light, medium or strong degrees. In glial fibriller acidic protein studies varied rates of positively are detected in neoplastic cells (9,19,21,22).

Glial fibriller acidic protein studies on the patient’s parafinned pathological preparations were found negative. In the similarly way, in a flow-cytometry examination of parafinned tissue revealed that although S phase was 3.54% there was a diploid cell population (figure 3).
Figure 3: Results of flow-cytometric study

Because the life expectancy was various in the literature, in defining the life expectancy it is very important to detect mitotic activity in these patients (9). Although there was no scheme of treatment in gliomatosis cerebri, radiotherapy is recommended in these cases (9).

We applied radiotherapy on our patient and in the general check-up following the treatment we detected no neurological deficit in the first year.

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