# Sectional and Morphological features of dislocation process during the temporal lobe tumors

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## Abstract

**Background:** Dislocation is the terrible complication of the temporal lobe tumors. The tumors of the temporal lobe are characterized by high rate of dislocation. Topographilly nearest of medio-basal part of temporal lobe to Pachion hole ensuring the formation of dislocation syndrome and preponderate of local symptoms over common cerebral symptoms.

**Aim:** The aim of our research is to study a structural correlation and morphological features of dislocation process during temporal lobe tumors for definition optimal surgical treatment.

**Methods:** We studied 85 dislocation cases of sectional material during temporal lobe tumors (53 males and 32 famales). All material of tumors were based on the microscope, macroscope and electro-microscope examination of operative and sectional material and were verified by many frontal and sagittal incisions of the brain.

**Results:** In medio-basal localization of tumors we didn't meet any benign tumors. In 6 (7%) of cases morphological compensation was so high, that we couldn't find any connection between tumor and dislocation. Some cases gyrus hippocampus and cingula were not pinched. During the dislocation process caused by temporal lobe tumors herniating of tonsila in the foramen Magna happens late, at the end, when in the cerebellum hemisphere may not happened rude morpho-logical changes. The factor of secondary ischemia of the brain may be considered. The herniation in the foramen Magna caused the ruin of vital functions in the stem, which is the reason of quick death.

**Conclusions:** Dislocation mostly occurred in the group of malign glioms of high grade, mainly localized in the medio-basal part of the temporal lobe. The realization of dislocation besides tumors pathobiological action is the factor of brain secondary ischemia, which is caused by the pressure of tumors on the main trunk and branches of the middle cerebral artery. From our point of view the reason of quick death is the herniation in the hole of Bisha.

## Keywords

temporal lobe, tumor, dislocation.

## Introduction

Dislocation is the terrible complication of the temporal lobe tumors. The tumors of temporal lobe are characterized by high rate of dislocation. During the dislocation caused by the temporal lobe tumors, unlike the tumors of subtentorial localization, local symptoms advantages over the common cerebral symptoms. Epileptic seizures can be one of the most important local symptom for diagnostic of dislocation process during the temporal lobe tumors (5). The volume of dislocation part of brain depend on the tumor mass and swelling of herniation area (3). The knowledge of dislocation process is very important for optimal neurosurgical treatment. Depending on the topography of the temporal lobe in dislocation more important is primary intralobular localizations of tumors in limits of temporal lobe share. So, for example, anteriorly located tumors displaced forward departments of hippocampus and posteriorly located back parts of gyrus hippocampus.
The aim of our research is to study a structural correlation and morphological features of dislocation process during temporal lobe tumors for definition optimal surgical treatment.

## Material and Methods

We studied 85 dislocation cases of sectional material during temporal lobe tumors – 53 males and 32 females. The localization and histological characterization of tumors were based on the microscope, macroscope and electro-microscope examination of operative and sectional material and were verified by many frontal and sagittal incisions of the brain (1). All invistigations were supplemented by modern rentgenocontrast (CT, MRI and Angiography) researches. For examination of dislocation process, depending on the temporal intralobular localisation, our material we divided into four groups: tumors of temporal polus localization, middle area localization, post area localization and medio-basal localization. All these cases took place in the Neurosurgical Clinic of Tbilisi First Clinical Hospital.

## Discussion of obtained results

Topographilly nearest of medio-basal part of temporal lobe to Pachion hole ensuring the formation of dislocation syndrome and preponderate of local symptoms over common cerebral symptoms difference to other supratentorial tumors. In medio-basal localization of tumors we didn't meet any benign tumors.

Medio-basal tumors against other parts of temporal share seldom accompanied with epileptic seizures. At increasing of intracranial pressure the epileptic attacks faded quickly or disappeared giving place to general cerebral and stem symptoms. They are extremely rare in terminal and dis-

location stage of disease. There weren't any morphological changes at cerebellum and stem incisions. Some cases gyrus hippocampus and cingula were not pinched. The degree of dislocation depends on exhaust of brain's compensatory reserves caused by pathological process. The volume of moving brain depend on tumor mass, its neighbouring to the wedge area and perifocal swellling. In some cases brain swelling caused by grouth of cerebral hemisphere often surpass swelling caused by tumor. In dislocation very important role give the swelling of cingula with its displacement on the different degree under the falx. We note herniation of cerebellar tonsil in the foramen Magna in 15 (18%) of cases. Sometimes, when the cerebellar hemispheres were symmetric and capsula limpid, still there was a strangulation line on the tonsils (5 cases). In 6 (7%) of cases "morphological compensation" was so high, that we couldn't find any connection between tumor and dislocation. At this moment because of quickly developing death may never be time for wedging in the foramen Magna. During the dislocation process caused by temporal lobe tumors herniating of tonsila in the foramen Magna happens late, at the end, when in the cerebellum hemisphere may not happened the formation of rude morphological changes (4). The factor of the secondary ischemia of the brain may be considered. When the dislocation developed quickly, with pinching on three levels, whereas the reason of death is caused by tumor's herniation in the hole of Bisha (2). Because of sudden death there might never be time for herniation in the level of foramen Magna, as herniation of tonsils in the foramen Magna happens on the final stage. The reason while tonsil strangulation led sudden death is that herniation of cingula under the falx and hippocampus in the foramen Bisha had happened consistently. After tonsil strangulation because come quick death, that sequencely still had happened wedging of cingula under falx and hippocampus in the foramen of Bisha. Herniation of gyrus cingula under falx took place in 20 cases from here in 7 cases there was its isolate herniation and in 13 cases its combination with gyrus hippocampus. The herniation in the foramen Magna caused the ruin of vital functions in the stem, which is the reason of quick death. From our point of view the reason of quick death is the herniation in the hole of Bisha. In the development of dislocation very important is compression or damage stem and oblong brain by tumor, where are situated respiratory and vascular centres.

## Conclusions

The development of dislocation process depended on the intralobular localization and histological features of temporal lobe tumors (6). Dislocation mostly occurred in the group of malign glioms of high grade. At medio-basal localization of tumors (basically they are malignant tumors) the dislocation is observed more often than in the other parts of temporal lobe. The realization of dislocation syndrome besides tumors pathobiological action is the factor of brain secondary ischemia, which is caused by the pressure of tumors on the main trunk and branches of the middle cerebral artery. The dislocation depends on the tumor's localization, histology, rate of tumor's growth and swelling of herniation area.

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