

Abstract

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FEATURES OF LOCALIZATION OF BRAIN TUMORS WITH DIFFERENT HISTOLOGICAL STRUCTURE

Brain tumors is a heterogeneous group of various intracranial tumors, benign or malignant, primary and secondary, which develop due to the launch of the process of abnormal uncontrolled division of cells.

In the structure of the total cancer incidence, brain tumors account for 0.7-1.5 % cases. The distribution of primary brain tumors in the population ranges 4 to 14 (more often 5-7) per 100 thousand population. Whereby, in Ukraine the incidence of brain tumors in men is 10.2 per 100 thousand population, and among women 7.6 per 100 thousand population. The mortality rate ranks 3rd among all causes of death. Most often, the detection of this pathology is observed at the age of 20 to 50 years.

A sample analysis of 37 medical records of patients with brain tumors of different localization, who were having inpatient treatment in neurological departments of the Municipal Institution of the Sumy Regional Council "Sumy Regional Clinical Hospital" and the Municipal Non-profit Enterprise "Clinical Hospital No. 4" of the Sumy City Council in 2015-2017, was carried out.

Among the patients there were 14 (37.8 %) women and 23 (62.2 %) men. The mean age was 45.5 ± 3.8 years.

Instrumental examination was carried out over time using magnetic resonance imaging (1.5 T) and computer tomography with intravenous contrast enhancement over time (before and after surgery). The condition of the brain tissues was evaluated before and after surgical intervention, the localization and the presence/absence of secondary swelling of the brain tissue was determined.

The pathohistological study was conducted in the conditions of the certified laboratory of the Regional Municipal Institution of Sumy Regional Clinical Oncological Dispensary.

Processing of statistical data was carried out using the licensed version of IBM SPSS Statistics 17 program.

Purpose and objectives of the study: to analyze topographic, histological and clinical peculiarities of brain tumors.

Our study established that space occupying lesions of the brain significantly more often were localized in the temporal lobes (16 patients – 43.2 %), most often was diagnosed astrocytoma, localized in the frontal areas (7 patients – 18.9 %).

During the analysis of the results of neurological examination of patients it was found that focal syndrome was significantly predominant in 20 (54.1 %) patients, among whom astrocytoma was verified in 18 (48.6 %) of the examined.

We have not found the dependence of the development of leading focal or hypertensive syndromes on the localization of brain tumors ($p > 0.5$).

Secondary edema of peripheral brain tissues was diagnosed in 21 (56.8 %) patients. Astrocytoma – 11 (52.4% of the total number of patients with edema), was significantly more aggressive in terms of development of the studied complication.

Keywords: brain tumors, topographic and histological features, secondary cerebral edema, clinical syndrome.

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Резюме

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ОСОБЛИВОСТІ ЛОКАЛІЗАЦІЇ ПУХЛИН ГОЛОВНОГО МОЗКУ РІЗНОЇ ГІСТОЛОГІЧНІ СТРУКТУРИ

Пухлини головного мозку – це гетерогенна група різних внутрішньочерепних новоутворень, доброякісних та злоякісних, первинних і вторинних, які виникають унаслідок запуску процесу аномального неконтрольованого поділу клітин. У структурі загальної онкологічної захворюваності пухлини головного мозку складають 0,7–1,5 %. Поширення первинних пухлин головного мозку в популяції складає від 4 до 14 (частіше 5–7) на 100 тис. населення.

Мета і завдання: проаналізувати топографо-гістологічні та клінічні особливості пухлин головного мозку.

Було проведено вибіркового аналізу 37 медичних карт хворих із пухлинами головного мозку різної локалізації, які знаходились на стаціонарному лікуванні у неврологічних відділеннях Комунального закладу Сумської обласної ради "Сумська обласна клінічна лікарня" та Комунального некомерційного підприємства "Клінічна лікарня № 4" Сумської міської ради у 2015–2017 роках. Середній вік склав $45,5 \pm 3,8$ років. Оцінювали стан тканин головного мозку до і після хірургічного втручання, визначали локалізацію, наявність або відсутність вторинного набряку тканин головного мозку, проводили аналіз патогістологічного висновку. Обробка статистичних даних проводилася за допомогою ліцензійної версії програми IBM SPSS Statistics 17.

Нашим дослідженням встановлено, що об'ємні новоутворення головного мозку вірогідно частіше локалізувались в скроневих частках (16 хворих – 43,2 %), найчастіше діагностувалася астроцитомою, розташована у лобних ділянках (7 пацієнтів – 18,9 %), переважав вогнищевий синдром – 20 (54,1 %) хворих, серед яких у 18-ти (48,6%) обстежених було верифіковано астроцитому.

У 21-го (56,8 %) пацієнта діагностовано вторинний набряк перифокальних тканин головного мозку. Більш агресивною щодо розвитку досліджуваного ускладнення вірогідно виявилася астроцитомою – 11 (52,4 % від загальної кількості хворих із набряком).

Ключові слова: новоутворення головного мозку, топографо-гістологічні особливості, вторинний набряк тканин головного мозку, клінічний синдром.

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Introduction

Brain tumors is a heterogeneous group of various intracranial tumors, benign or malignant, which develop due to the launch of the process of abnormal uncontrolled division of cells, which used to be normal components of the brain tissue itself (primary tumors), lymphatic tissue, brain blood vessels, cranial nerves, meninges, glandular formations (pituitary and epiphysis), or otherwise develop as a result of metastasis of the primary tumor, located in another organ (secondary) [1; 2].

In the structure of the total cancer incidence, brain tumors account for 0.7-1.5 % cases. The distribution of primary brain tumors in the population ranges 4 to 14 (more often 5-7) per 100 thousand population. Whereby, in Ukraine the incidence of brain tumors in men is 10.2 per 100 thousand population, and among women 7.6 per 100 thousand population. The mortality rate ranks 3rd among all causes of death. The incidence in children is slightly lower. Most often, the detection of this pathology is observed at the age of 20 to 50 years [3].

The etiology of brain tumors has not been fully studied, but it has been proved that concomitant neurological diseases exacerbate clinical manifestations and worsen the prognosis [4]. Among theories that explain the mechanism of this pathology, the most popular is the theory of unfavorable exo- and endogenous factors (intoxication, inflammation, ionizing radiation, carcinogenicity, hormonal disorders, prolonged traumatization, etc.) that cause hyperplasia, which contributes to uncontrolled cell growth with changes in their genetic information [5].

Besides, the cause of the blastomatous process development may be an embryonic development disorder, dysontogenetic heterotopia, and brain structure atypia. The type of tumor is determined by the cells forming it [6].

Diagnosis is based on neurological examination data and additional research methods, which include magnetic resonance imaging, computed tomography and angiography [7].

Materials and methods. A sample analysis of 37 medical records of patients with brain tumors of different localization, who were having inpatient treatment in neurological departments of the Municipal Institution of the Sumy Regional Council "Sumy Regional Clinical Hospital" and the Municipal Non-profit Enterprise "Clinical Hospital

No. 4" of the Sumy City Council in 2015-2017, was carried out.

All patients underwent surgery – subtotal or partial removal of tumors.

All patients had internal deep brain localization of tumors with compression effect on brain tissue without signs of dislocation of brain structures.

Among the patients there were 14 (37.8 %) women and 23 (62.2 %) men. The mean age was 45.5 ± 3.8 years.

Instrumental examination was carried out over time using magnetic resonance imaging (1.5 T) and computer tomography with intravenous contrast enhancement over time (before and after surgery). The condition of the brain tissues was evaluated before and after surgical intervention, the localization and the presence/absence of secondary swelling of the brain tissue was determined.

The pathohistological study was conducted in the conditions of the certified laboratory of the Regional Municipal Institution of Sumy Regional Clinical Oncological Dispensary.

Processing of statistical data concerning topographic, histological and age-related peculiarities was carried out using the licensed version of IBM SPSS Statistics 17 program.

Purpose and objectives of the study: to analyze topographic, histological and clinical peculiarities of brain tumors.

Results. During the analysis of data on the localization of brain tumors, it was found that out of 37 patients, 6 (16.2 %) had a space occupying lesion in the right temporal region, 4 (10.8 %) – in the left temporal region. In 7 (18.9 %) patients the tumor was localized in the right frontal area, in 4 (10.8 %) – in the left frontal lobe. In 5 (13.5 %) patients, the tumor was diagnosed in the left parietal region, in 3 (8.1 %) the tumor was localized in the left parietal-temporal lobe, and in 2 (5.4 %) – in the right parietal-temporal region. In 6 (16.3 %) patients, one patient (2.7%) per case, tumor was localized in the right parietal-occipital, right frontal-temporal region, right thalamic, right pineal region, right frontal-parietal and right petroclaval areas. The distribution was significant ($P \leq 0.05$).

The distribution of localization of brain tumors depending on the histological structure was significant ($P \leq 0.05$). According to the pathohistological study data 18 (48.6 %) patients were diagnosed with astrocytoma with localization: in 5 (13.5 %) patients – left frontal area, in 4 (10.8 %) – right temporal lobe, in 3 (8.1%) – left parietal-temporal lobe, in 2 (5.4 %) – right frontal

area, in 1 (2.7 %) – right parietal-temporal lobe, in 2 (5.4 %) – right parietal-occipital and in 1 (2.7 %) – right frontal-parietal lobe of the brain. 5 (13.5 %) patients had pathohistologically confirmed glioblastoma, which was localized in the right temporal – 2 (5.4 %), right frontal – 2 (5.4 %), right thalamic – 1 (2.7 %) region. Another 7 (18.9 %) patients were diagnosed with structureless tumor with signs of proliferation with localization: in 4 (10.8 %) patients in the left temporal region and in 3 (8.1 %) – in the right frontal region. Lymphoma in the parietal region was confirmed in 3 (8.1%) patients. Angiocavernoma of the middle (8.15 %) and rear (8.15 %) cranial fossae was diagnosed in 6 (16.3 %) patients.

During the analysis of the results of neurological examination of patients it was found that focal syndrome was significantly predominant in 20 (54.1 %) patients, hypertensive – in 13 (35.1 %) of examined, asymptomatic course was observed in another 4 (10.8 %) patients. Out of 18 patients with astrocytoma, focal syndrome was diagnosed in 12 (32.4 %), hypertensive in 6 (16.2 %) patients. Out of 5 of the examined with glioblastoma: 3 (8.1 %) patients had a pronounced focal and 2 (5.4%) – hypertensive syndrome. Focal syndrome dominated in 5 (13.5 %), hypertensive in 2 (5.4 %) patients with significantly unconfirmed histological diagnosis. In patients with lymphoma, the leading symptom was focal. Patients with angiocavernoma had confirmed hypertensive syndrome.

Conclusions

Our study established that space occupying lesions of the brain significantly more often were localized in the temporal lobes (16 patients – 43.2 %), most often was diagnosed astrocytoma, localized in the frontal areas (7 patients – 18.9 %).

During the analysis of the results of neurological examination of patients it was found that focal syndrome was significantly predominant in 20 (54.1 %) patients, among whom astrocytoma was verified in 18 (48.6 %) of the examined.

Prospects for further research

The study of the histological structure of brain tumors depending on their localization is an integral part of both diagnosis and treatment (possible

We have not found the dependence of the development of leading focal or hypertensive syndromes on the localization of brain tumors ($p > 0.5$).

Secondary edema of peripheral brain tissues was diagnosed in 21 (56.8 %) patients: in 11 (52.4% of the total number of patients with edema) patients with astrocytoma, in 5 (23.7 %) with glioblastoma, in 1 (4.8 %) with histologically nonverified tumors, in 3 (14.3 %) patients with lymphoma and in 1 (4.8 %) with angiocavernoma.

Discussion.

The results of our research were consonant with the data of literary sources, which were analyzed during the planning phase. That is, space occupying lesions of the brain were significantly more often localized in the temporal lobes, astrocytoma was most often localized in the left frontal region, regarding glioblastomas, meningiomas, angiocavernomas significant dependence on localization was not revealed, as evidenced by the data of Kornienko V. M., Pronin I. M., 2012, published in the paper, relating to diagnostic neuroradiology, as well as the results of the study of Makeev S., 2011, described in scientific papers on the aspects of clinical oncology and tomographic examination of brain tumors. Histological and topographical peculiarities of our study also corresponded to the statistics, presented in the publication of the cancer registry in 2018.

We have not found the dependence of the development of leading focal or hypertensive syndromes on the localization of brain tumors ($p > 0.5$).

Secondary edema of peripheral brain tissues was diagnosed in 21 (56.8 %) patients. Astrocytoma – 11 (52.4% of the total number of patients with edema), was significantly more aggressive in terms of development of the studied complication.

minimally traumatic access during surgery, the type and extent of radiation and chemotherapy), and an important component of predicting the quality of patient's life.

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