The morbidity rate of primary and recurrent brain tumors is 10.9 – 12.8 per 100000 of population. About half of cases are glial tumors, most of them having supratentorial localization. Now the rate of high-grade gliomas is up to 50% of all the glial tumors. The accepted standard of treatment includes surgical treatment aimed to maximum possible tumor resection and histological diagnosis verification, radiotherapy, summary total dose being 50-60 Gy, and chemotherapy.

Considering frequent recurring of high-grade gliomas inspite of complex treatment the elaboration of new treatment methods is a highly topical problem. Photodynamic therapy (PDT) has a direct cytotoxic effect upon the tumor tissue, as well as it possesses a number of photochemical effects among which antiangiogenic, anti-inflammatory, immunologic and antiviral are to be pointed out.

One of the potential advantage of this method of treatment is the PDT selectivity of affect upon tumor tissue. It depends on the difference of photosensitizers concentration in tumor and normal tissue, as well as on the limited light penetration into biological material.

Materials and methods.

In our department 31 patients with high-grade glial tumors of supratentorial localization had PDT. The second generation Russian drug Photoditazin of e6 chlorine group was used in the dose of 50 mg as a photosensitizer. Age: 23 – 69 years old. Sex: male – 18, female – 13. Follow-up: 1 month – 4 years.

The first group included 16 cases of newly diagnosed tumors; the second – 15 cases of recurrent gliomas. Glioblastomas were established in 21 cases, anaplastic astrocytomas in 7 cases and anaplastic oligodendrogliomas in 3 cases. During anaesthetic induction the patients received Photoditazin intravenously.

Complete tumor tissue resection was done to the extent possible. Ultrasound navigation was used to control the resected tumor volume. Test model of semiconductor laser “Latus-2.5” was used as irradiation source; power – up to 2.5 W, radiation wave length – 662nm. After resection into the tumor bed multifiber flexible lightguide from the optic radiation source was placed, wave length being 662 nm which corresponded to the maximum spectral absorption of Photoditazin. Tumor bed was irradiated by photo dose 180-400 J/sm². In postoperative period during 28 hours after surgery completion the patient was wearing sunglasses lest direct sun rays should have penetrated to the amблиостроды.

All the patients discharged from the hospital had compensated status. No complications resulted from the photosensitizers administration and further intraoperative irradiation were revealed. In postoperative period all the patients with newly diagnosed glial tumors had radiotherapy, summary total dose 54-60 Gy. The level of life quality during hospital stay was 70-90 according to Karnofsky PS. The length of recurrence free period for the patients with primary malignant gliomas was 18,5±3,8 mths.; for the patients with recurrent malignant gliomas - 10,7±2,3 mths. For the period of follow-up data collection in 2009 2 patients were alive, one having newly diagnosed glioblastoma multiforme of the right parietal lobe (4 years catamnesis), the second one had recurrent glioblastoma of the right frontal and parietal lobes (6 months catamnesis).

Resume:

PDT is a relatively safe method which allows intraoperative impact over the residual tumor cells volume located in perifocal zone.

Short period required for the medication washout allows to minimize insolation regime restriction in postoperative period as well as makes it possible to start radiotherapy on the 3-4 week after surgery.
PDT use in complex treatment of highgrade glial tumors of supratentorial localization allows to prolong recurrence free period of this category of patients.