Multimodal approach in the surgical management of tumors in language area

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I have nothing to disclose
Introduction

The current gold standard for resection of gliomas located in language-eloquent area is awake-surgery.

In our series we tried to evaluate the use of multimodal approach in the surgical management of tumors in language area.
Methods

• In the period from 2014 to 2018, 43 patients (24♀:19♂) underwent awake-surgery for tumor in the language area at NMSC named after N.I. Pirogov.
• All patients underwent evaluation by multidisciplinary team.
• Neuro-imaging (MRI, fMRI, tractography) was performed in all patients
• Intraoperative neurophysiological monitoring was used in routine.
• A comprehensive Russian Aphasia Test (RAT) was used to assess language function by Neurolinguistics.
• Tumors were resected under the use of intraoperative navigation.
• Tactic of treatment were established only after the result from pathologist.
Results

• There was no mortality.

• In 75% of the cases Karnofsky performance status improved or remained same.

• Early postoperative motor deficits were observed in 6(14%) cases, which completely regressed in 3 patients in follow-up of 6 months, remaining 3 patients presented with mild weakness.

• 24(55.8%) patients presented with post-operative aphasic disturbance (19- transient mild aphasia, 3- moderate aphasia, 3- severe aphasia). In follow-up only 3 patients did not completely recover.
Results (2)

• Low-grade gliomas were in 14(33%) cases, high-grade gliomas in 26(60%) cases and in 3(7%) cases were metastasis.

• Mean follow-up period was 14 months.

• 2 patients with low-grade gliomas presented with residual and were re-operated.

• Patients with HGG had no residuals in first 6 months of follow-up.

• Unfortunately only 10 patients were followed up for up to 24 months. 3 patients had residual after 9 months and all of them were re-operated.

Extent of resection (EOR)

• Total removal was achieved in 34 (79%) cases;
• Subtotal in 7 (16.3%) cases
• Partial resection in 2 (4.7%) cases.
Results (3)

Pre-operative MRI and tractography

- **fMRI**: naming zone located near anterior border of tumor, listening to the posterior.
- **Tractography**: tumor is surrounded by the important tracts.

Intra-operative

Slow speech, acaulusia, alexia, speech arrest, clonic facial movements, anomic aphasia
Results (4)

Post-operative images
Discussion

- The current gold standard for resection of gliomas located in language-eloquent brain regions is awake surgery and in the last decades, the technique of awake surgery has improved tremendously.

- The median survival time and the time to recurrence have been found to be longer in patients who have undergone gross-total tumor resection. However, such brain tumor resection in eloquent brain regions carries a high risk of morbidity.

- To minimize the incidence of failures during awake craniotomy, a professional preoperative evaluation by a multidisciplinary team that includes careful selection of patients should be considered standard.

- Evaluation of the language function is vital for well-planned awake surgery. With the help of neurolinguistics, we manage to come up with linguistic protocol.

- Different methods and tools are available for a safe approach and secure resection of the tumor in eloquent areas but relying on one method or another is not sufficient for the achievement of good result thus we decided to use multi-modal approaches with standard protocol.
Summary Points

• Multimodal approach is an effective method for the surgical management of tumors in language areas.

• Excellent extent of resection can be achieved with good clinical outcome.