STRESZCZENIE W JĘZYKU ANGIELSKIM

Introduction

The trend of morbidity and mortality due to cancer in Poland and around the world is increasing. It is estimated that approximately 20% of cancer patients will develop metastases in the central nervous system. The extension of patient survival related to the development of oncology and more modern methods of diagnosis and treatment will increase this percentage in the future. The main methods of treating brain metastases are surgery, chemotherapy and radiotherapy. The prolonged survival of patients and the need to improve the quality of life of patients forced the dynamic development of radiotherapy and radiosurgery. Radiosurgery is a treatment method that allows precise irradiation of single and multiple lesions with a high dose of radiation with maximum sparing of surrounding tissues in a short time.

Work goals

The intensive development of radiosurgery and the still existing inaccuracies in the literature led to the following goals in the doctoral dissertation:

1) Assessment of patient survival and factors influencing survival within 1 year after SRS (DCA-SIMT) of multiple metastatic lesions
2) Assessment of local control and factors influencing local control of multiple metastatic lesions in the CNS after SRS using the DCA-SIMT technique
3) Assessment of the safety of SRS using the DCA-SIMT technique in the treatment of multiple metastatic lesions in the CNS in the early period after treatment

Methods

The retrospective analysis was based on a group of 123 patients of the Department of Neuro-oncology and Radiosurgery of the Oncology Center. Franciszek Łukaszczyk in Bydgoszcz with multiple brain metastases, in whom a total of 560 metastatic lesions were

treated. The patients underwent sterotactic radiosurgery in accordance with applicable guidelines. Patients with available brain magnetic resonance imaging 6 months after the end of treatment were included in the analysis of local control of SRS using the DCA-SIMT technique. A total of 195 metastatic lesions in 36 patients were subjected to this analysis. In 95 patients who came for follow-up after radiotherapy, toxicity was analyzed in the early period after treatment.

Results

Among the analyzed group, 51% of patients were men and 49% were women. The median age of the patients was 64 years, the median number of treated lesions was 4. The most common histopathological diagnosis was non-small cell lung cancer (66%).
The median survival was 7.2 months, 16% of patients were still alive after the analysis. The 6- and 12-month survival rates were 57% and 29%, respectively. In multivariate analysis, it was found that the sum of PTV volumes correlated with patient survival (p=0.0007). No similar relationship was found for the number of metastases. An increase in the total volume of lesions by 1 cm3 increased the risk of death within a year by 2%. Histopathological diagnosis of squamous cell carcinoma correlated with worse prognosis. Neurologic symptoms remained stable or improved in 61% of patients. There was no correlation between the severity of neurological symptoms and the V12 parameter (p=0.319). Local control was achieved in 93% of the analyzed lesions 6 months after treatment. Lesions with a margin of at least 0.5 mm showed greater local control 6 months after treatment (p=0.049). Better response was also associated with a conformity index (CI) below 1.42 (p=0.0006) and with patients receiving immunotherapy or targeted therapy within 4 months of SRS (p=0.026).

Conclusions

1) The results of radiosurgery treatment of multiple brain metastases indicate a high percentage of patients with long survival, i.e. over a year
2) Radiosurgery using the DCA-SIMT technique is a highly effective method of local treatment of multiple metastases to the central nervous system

3) Factors such as conformity of dose distribution or margin are important for local control of metastatic lesions and these parameters should be taken into account when planning and implementing treatment

4) In most patients undergoing radiosurgery, neurological symptoms stabilize or improve. There were no significant treatment-related adverse events.