

**REMOTE GAMMA THERAPY AT THE STAGES OF COMBINED TREATMENT
WITH INTRAOPERATIVE RADIATION THERAPY OF MALIGNANT
NEOPLASMS**

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ABSTRACT: At present, abroad and in Russia there is a fairly large clinical experience of combined treatment using intraoperative radiation therapy for patients with various localizations of malignant neoplasms. In the overwhelming majority of cases, combined treatment with IORT in a single dose of 15-20 Gy on the "bed" of the removed tumor cannot guarantee a high percentage of stable clinical remissions (Gillette E L 1988, Calvo F A , et al 1998) In the USA, where intraoperative radiation therapy began to be performed in 1976, a high dose of single radiation (IORT) was considered as a "boosting" one when combined with external beam radiation therapy. Intraoperative radiation therapy, performed at the Institute of Oncology of the Tomsk Scientific Center of the Siberian Branch of the Russian Academy of Medical Sciences since 1989 in the combined treatment of malignant neoplasms of various localizations, is supplemented in the vast majority of cases by external beam gamma therapy (IGT). Currently, a preoperative course of GAT at the first stage of combined treatment with subsequent surgery and IORT is more often performed in patients with locally advanced forms of malignant neoplasms of the nasal cavity and paranasal sinuses (Novikov V. A. 2002). In combined treatment with IORT of soft tissue sarcomas, cancer of the uterine body and other localizations, external beam radiation therapy is performed in the postoperative period (Molls M , GradingerR 2004) In recent years, the Oncology Research Institute of the Siberian Branch of the Russian Academy of Medical Sciences has conducted clinical testing of a combined method for treating stage 1b -Pa uterine body and cervical cancer with intraoperative radiation therapy in a single dose of 10 Gy and DHT in the postoperative period for additional exposure to the parametrium area (Chivchish L.N., Kolomietz L.A. 2006). Combined treatment with IORT and DHT for invasive forms of uterine body cancer is carried out to prevent possible relapses in the vaginal stump. Data on the use of the value of the total focal dose of additional remote gamma therapy in combined treatment with IORT are contradictory and vary from 9 to 66 rp . (Haddock M G 1983, Webb M J 1997) The increase in the number of patients with early forms of breast cancer has led to an increase in the number of organ-preserving operations (Fridman N 1988) Italian scientists believe that intraoperative radiation therapy may become another important component of the complex treatment of patients with early stages of breast cancer (Galimbarti V , Zurrida S , et al 2000) However, many issues of combined treatment with IORT and DHT of locally advanced forms of malignant neoplasms of various localizations remain unresolved. The problem of calculating the spatial distribution of the dose of electron and 4 gamma radiation during mixed irradiation of the "bed" of the removed tumor has not been fully solved. There is significant variability in the total course doses of DHT during combined treatment with IORT of malignant neoplasms of various localizations. The optimal ratio of the contributions of the isoeffective dose from

IORT and the total dose of DHT to the course dose of mixed irradiation of malignant neoplasms has not been studied. There are few data on early radiation reactions of normal tissues after the use of combined treatment with IORT in patients with various single doses. The listed issues were the focus of attention in the implementation of this work. Objective of the study To improve the results of combined treatment with IORT and DHT of malignant neoplasms of individual localizations by determining the spatial distribution of the dose of mixed irradiation and the role of remote gamma therapy. Research objectives 1 To substantiate the significance of the spatial distribution of the dose of mixed irradiation (IORT and DHT) in the combined treatment of malignant neoplasms of the nasal cavity and paranasal sinuses, soft tissue sarcomas, endometrial and breast cancer 2 To determine the ratio of the contribution of isoeffective doses of IORT and DHT when choosing a course dose of mixed irradiation, taking into account the tolerance of normal tissues 3 To study the nature and frequency of radiation reactions and radiation injuries to normal tissues during mixed irradiation of malignant neoplasms of individual localizations 4 To study the overall and relapse-free survival of patients with malignant neoplasms in the study groups during combined treatment with IORT and DHT 5 To conduct clinical testing and assess the tolerability of the combined treatment method with IORT and DHT according to the criterion of acute radiation reactions of the skin in patients with breast cancer T¹ No - i¹ Mo stage Scientific novelty For the first time, the features of the spatial distribution of the absorbed dose of mixed irradiation (IORT and DHT) were studied in the combined treatment of malignant neoplasms of the nasal cavity and paranasal sinuses, soft tissue sarcomas, endometrial and breast cancer uterine cancer and 5 breast cancer, which indicate the advantage of using mixed irradiation compared to gamma therapy alone. For the first time, the contribution of the total focal dose of distance gamma therapy to the course dose of mixed irradiation in patients with malignant neoplasms of the indicated localizations was determined, which ranges from 53% to 80%, indicating a significant role of DHT in combined treatment with IORT. The value of the total focal dose for the postoperative course of DHT in patients with soft tissue sarcomas should not be less than 40 Gy (course SOD 65 - 75 isogy), which helps to reduce the relapse rate to 34% in the risk zone of tumor invasion. For the first time, a clinical trial of complex treatment with intraoperative radiation therapy and remote gamma therapy was carried out in patients with breast cancer T¹ No - i¹ Mo and An assessment of the new treatment method was given according to the criterion of acute radiation reactions of the skin The conducted assessment of three- and five-year overall and relapse-free survival of combined treatment with IORT and DHT of malignant neoplasms of the specified localizations with a course dose in terms of the VDF factor of 100 - 120 uel units showed improved results in comparison with standard treatment methods Practical significance As a result of computational studies, characteristics of the spatial distribution of the electron beam dose and gamma radiation were obtained, which are intended for planning and evaluation of a mixed irradiation course (IORT and DHT) in patients with malignant neoplasms of the nasal cavity and paranasal sinuses, soft tissue sarcomas, uterine and breast cancer The results of this study on the combined treatment of malignant neoplasms with IORT and DHT have been implemented in the clinical departments of the Oncology Research Institute of the Tomsk Scientific Center of the Siberian Branch of the Russian Academy of Medical Sciences An application has been submitted for the "Method of Combined Treatment of Uterine Cancer Stage 1b - At" (priority certificate No. 2005122774 dated July 18, 2005) Key provisions submitted for defense: 1 The spatial distribution of the absorbed dose of electron and gamma radiation (IORT and DHT), obtained by the calculation method of the study, indicates the advantage of using

mixed irradiation of malignant neoplasms in comparison with the use of gamma therapy alone 2 The choice of the number of sessions and the value of the total focal dose of the pre- or postoperative course of distance gamma therapy with taking into account the IORT dose and the break in treatment, ensures the effectiveness of the 6 mixed irradiation program in the combined treatment of malignant neoplasms 3 Remote gamma therapy in combined treatment with IORT makes the main contribution to the course dose of mixed irradiation (53% -80%), which helps to improve three- and five-year indicators of overall and relapse-free survival of patients with malignant neoplasms of the nasal cavity and paranasal sinuses, soft tissue sarcomas, and uterine cancer lb - At stage.

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