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CARBONEN AND UNCONVENTIONAL IRRADIATION SCHEDULE IN GLIOBLASTOMA: A METHOD TO ENSURE STABILITY OF O₂ AND CO₂ CONCENTRATIONS. Fatigante L. Cartei F. Ducci F. Laddaga M. Radioterapia-Università-Pisa. In mouse tumor models it has been shown that carbogen breathing increases cells radiosensitivity particularly when combined with nicotinamide. The crucial point in humans is to obtain a steady-state gas exchange during carbogen administration. The aim of this study was: to describe a method ensuring stable values of O₂ and CO₂ inspired concentrations during carbogen breathing; to assess the right time to reach constant values of expired gas fractions in order to start irradiation. 6 pts. with glioblastoma treated with bifractionation radiotherapy and nicotinamide were enrolled in this study. To evaluate the duration of pre irradiation breathing time, in all pts. PaO₂, PaCO₂, pH, O₂ saturation were measured. Breath rate, minute ventilation, blood pressure, were also monitored. All pts. reached the steady-state of gas exchange within 10 min. without side effects.

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BONEMARROW DAMAGE AND RECOVERY AFTER HIGH DOSE IRRADIATION INVESTIGATED WITH IMMUNOSCINTIGRAPHY

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Bone marrow is one of the most radiosensitive organs and may be the dose limiting factor in radiation therapy with large portals. We investigated suppression and recovery of human bone marrow following unilateral asymmetric irradiation in comparison to the other unirradiated side in breast cancer patients with lymph node metastases. After surgery they are commonly treated with radiotherapy. While target volume covers locoregional (e.g., infra/supraclavicular, internal mammary, axillary) lymph nodes and chest wall the portals also include to some extent clavicle, scapula, and proximal humerus on one side. Bone marrow imaging was performed with ^{99m}Tc-labeled murine monoclonal IgG₁-antibodies against NCA-95 expressed in granulocytes as well as granulopoietic precursor cells. The antibody uptake was evaluated in predefined regions of interest (ROI). Those patients who presented with non-lymphatic spread (in particular bone metastases) at time of bone marrow scan were excluded from this retrospective study. 32 patients treated from 1980 to 1992 were examined with immunoscintigraphy, 18 were evaluable without other apparent sites of spread. The age ranged from 29 to 77y. The applied dose was 42 (12-50) Gy, recovery time was 29 (0-113) months. All patients demonstrated a decreased uptake within the portal. The influence of additional chemotherapy, age, dose, and recovery time was analyzed. The length of recovery time inversely corresponded to the decrease in bone marrow uptake. However, none of these factors proved to be significant in a multivariate statistical analysis. Because all but 3 patients receipt full dose irradiation (46-50 Gy) in these data it was impossible to observe influence of dose. In summary immunoscintigraphy appears to be a feasible method for early detection and follow up of radiation induced bone marrow damage.

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THE ROLE OF SOMATOSTATIN, GASTRIN AND VIP SERUM LEVELS IN FOLLOW UP OF RADIATION THERAPY IN CARCINOMA UTERI
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It is well known that the radiation therapy (RT) influence the symptoms of radiation syndrome. The authors tested the secretion of APUD endocrine cells after radiation therapy. Somatostatin and VIP were determined in serum by RIA kits from Prof. S.R. Bloom Laboratory (Hammer-smith Hospital, London) and gastrin by RIA CIS. The mean values of neurotransmitters (pmol/l) were:

	Somatostatin	Gastrin	VIP
-in control group (30)	49,5±20,1	23,1±16,5	14,5±1,5
-in patients with carcinoma uteri (72)			
before RT	27,2±8,1*	24,7±13,2	3,4±2,7
after RT	4,6±3,1**	49,7±21,6**	3,7±1,6

*p < 0,005 **p < 0,001

In patients with carcinoma uteri we found the statistically significant decrease of somatostatin levels, especially after RT and statistically significant increase of gastrin, until VIP levels were not changed. It is influence of radiation therapy on bowel's mucosa with somatostatin and gastrin cells, and must be on mind in monitoring of cancers by different receptor's techniques.

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HDR AFTERLOADING IN THE TREATMENT OF THE CERVICAL STUMP CARCINOMA - OUR EXPERIENCE AND RESULTS

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From February 1974. to June 1982. we have used combined HDR afterloading intracavitary brachytherapy (Cathetron) and external beam therapy (CO-60 TT, 10-MeV Linac) in 43 cases of cervical stump carcinoma. Out of the total number of 43 patients 29 of them, i.e. 67,1%, survived more than 5 years without any signs of local recurrences and/or distant metastases. Survival by stage (FIGO) indicates the following results: stage I - 11/13 (84,6%), stage II - 14/22 (63,3%) and stage III - 4/8 (50,0%). Local recurrences and late postirradiation sequelae were 8/43 (18,6%) and 6/43 (13,19%).

Key words: Intracavitary brachytherapy; HDR afterloading; cervical stump carcinoma.

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ORIGINAL PREOPERATIVE RADIOTHERAPY IMPROVES SURVIVAL IN GASTRIC CANCER PATIENTS

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To improve the treatment results of gastric cancer the original fractionation regime of the preoperative radiation dose based on scientific considerations and mathematic modeling instead of empiricism was elaborated and used. Total dose of 25 Gy was delivered during 7 days. Daily dose ranged 1.7-7.0 Gy was divided into two fractions with 5-6 hours interval. Operation was performed in 24-48 hours after completion of radiotherapy. The treatment regime was well tolerated. Comparing with the control group treated with surgery only, 3-year survival rate was significantly higher in combined treated group: 70.7% (41/58) vs 52.5% (31/59), p < .05. The most impressive advantages of the combined treatment were seen in patients with poor prognostic signs: T3-4 - 57.1% (12/21) vs 34.4% (11/32); N1-2 - 72.7% (8/11) vs 18.2% (2/11); infiltrative type of the tumor - 64.9% (24/37) vs 32.1% (9/28).

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RADIATION THERAPY IN THE PREVENTION OF HETEROTOPIC BONE FORMATION (HTB) AFTER HIP SURGERY IN PATIENTS WITH CONTRALATERAL HTB

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Patients with contralateral HTB after hip surgery have a high risk for developing HTB after surgery for the second hip. From October 1986 to June 1992, thirty-four hips in 34 patients with contralateral HTB were irradiated postoperatively to 10 Gy in 5 fractions, after surgery was performed on the second hip. In general, irradiation began within 5 days after surgery. Twenty-six patients never developed HTB, and 4 each formed Brooker grade I and II disease, which was clinically insignificant. Ten Gy in 5 fractions for total hip arthroplasty appears to be effective in preventing the development of clinically significant HTB.