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ADVANCED CERVIX AND ENDOMETRIUM CANCER: THE USE OF SERIAL MAGNETIC RESONANCE IMAGING (MRI) IN RADIATION THERAPY MONITORING.

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MRI is a valuable technique for noninvasive evaluation of the female pelvic region. The present study was aimed to evaluate the usefulness of serial MRI in HDR-afterloading and percutan radiation therapy monitoring. The recent results are based on experiences with 20 patients with histologically verified carcinoma of the cervix or the corpus uteri. The advantages of MRI-based therapy monitoring are: 1. accurate pretherapeutic staging, 2. excellent soft tissue contrast resolution, 3. definition of Region of Interest (ROI), 4. possibility of result reproduction, 5. clear change of tumor signal intensity as marker of treatment efficiency, 6. evaluation of tumor volume changes, 7. residual tumor and recurrence control. Present results suggest that serial MRI is emerging as an important imaging technique in the study of radiation therapy monitoring. Postirradiation signal intensity change of carcinoma tissue definitively reflect the treatment response of the tumor. This may be an important prognostic factor.

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MODULATION OF DRUG SENSITIVITY OF CANCER CELLS BY THE STIMULATION AND INHIBITION OF PROTEIN KINASE C.

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Development of multidrug resistance (MDR) is a multifactorial process that involves the overexpression or modification of P glycoprotein, increase in glutathione level, changes in the activity of topoisomerase II. Protein kinase C (PKC) plays a regulatory role in the function of proteins that are involved in the MDR phenotype. The inhibition of PKC may be predicted to modulate the MDR phenotype. The present study was aimed to investigate the PKC isoenzyme pattern of the MDR and drug sensitive colon tumor cells; reversion of MDR phenotype by the combination of PKC inhibitors and GSH depletion; development of combination therapy that involves differentiation inducers and cytotoxic drug. Our studies have shown that the PKC E isoform is elevated in the MDR colon tumor cells. Combined treatment with BSO and PKC inhibitors increased the therapeutic efficacy of Adriamycin and reversed the MDR phenotype. Differentiation can reverse the MDR phenotype by the inhibition of PKC E. It is suggested that the level of PKC E isoform may act to control the activity of P-glycoprotein, glutathione-S-transferase and topoisomerase II involved in the cytotoxic drug action. Development of therapeutic approaches that decrease PKC E level seems to be valuable for the modulation of MDR phenotype.

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TREATMENT PARAMETERS INFLUENCING THE OUTCOME OF COMBINED HYPERTHERMIA AND IRRADIATION

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Twenty-four pts with advanced malignant tumours were treated by different methods of combined hyperthermia and radiotherapy, mainly with a palliative intent. Complete tumor regression was achieved in 11 pts. The group was heterogeneous regarding previous treatment, tumor site and volume as well as the total radiation dose. The significance of particular parameters influencing the outcome of therapy was studied. Minimum intratumoral temperature was the most important factor, whereas the heating method and the total number of heatings did not affect the treatment results. Regarding radiotherapy parameters, the time interval between heating and radiotherapy as well as the fraction size of radiation given at the time of hyperthermia seemed to have a crucial impact on the therapy issue, whereas total radiation dose and previous radiation showed no relevance.

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INDIVIDUALIZED HDR-AFTERLOADING AND PERCUTAN RADIATION THERAPY MANAGEMENT IN CERVIX AND ENDOMETRIUM CANCER: THE USE OF RADIOLOGIC IMAGING TECHNIQUES.

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Humboldt-University Medical School (Charité), Department of Oncology, Schumannstr. 20/21, 1040-Berlin, Germany. Magnetic resonance imaging (MRI), computed tomography (CT) and ultrasound (US) plays an important role in the diagnosis of cervix and endometrium cancer. The present study was aimed to evaluate the usefulness of MRI, CT and US in individualized management of HDR-afterloading and percutan radiation therapy. Advantages are the exact pretherapeutic staging (Clinic, MRI/CT, US/Flow), the definition of Region of Interest (ROI) by MRI, the pretherapeutic definition of radiation exposure of surrounding tissues in 3D (MRI, US), the definition of intrauterine afterloading applicator position (US), the possibility of imaging result reproduction (MRI, CT), the residual tumor and recurrence control (MRI, US) but also the therapy monitoring (MRI, US/Flow). Present results suggest that MRI is emerging as an important imaging technique in the study of individualized radiation therapy but also in recurrence diagnosis and therapy monitoring.

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CONCOMITANT RADIOTHERAPY AND CHEMOTHERAPY OF INOPERABLE HEAD AND NECK SQUAMOUS CELL CARCINOMAS

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In a prospective randomized clinical study two modalities of treatment, i.e. radiotherapy (group A) vs concomitant radiotherapy and chemotherapy with Mitomycin C and Bleomycin (group B) are compared. In this preliminary report 29 patients were evaluable.

Complete response was achieved in group A in 4/14 (29%), and in group B in 10/15 patients (66%).

After a median follow up of 14 months (range 3-23) the probability of relapse free survival in group B has been 62% and in group A 24%. The difference is statistically significant, but for final conclusions a larger number of patients will have to be entered. The study is under way.

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SCATTERED RADIATION DOSE FROM TISSUE UNDER LEAD BLOCKS IN 6 MEV PHOTONS.

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A circular field of 10.5 cm diameter was irradiated by 6 MEV photons. At the center of the field a 13 cm thick lead block with basis diameter of 4.5 cm was aligned. The dose under the block was measured at different depths of lucite by film dosimetry. A model of Compton scattering was developed. Experimental results show that the scattered dose is in good agreement with the theoretical model calculations.

Keywords: Radiotherapy, Dosimetry, Scattered-Radiation