and 46% respectively. Squamous cell carcinoma was associated with a better outcome than adenocarcinoma (p=0.0189). Chemotherapy was not found to be a significant factor predicting for local control (p=0.59). Normal swallowing function was observed in 60% of patients, intermittent dilatation required in 29% of the patients and 11% patients continued with PEG feeding.

Conclusions: High dose rate endoluminal brachytherapy combined with external beam radiation with or without chemotherapy can be safely used as an effective boost. The local control rate and the functional results are encouraging.

523 POSTER

Aminothiol WR-1065, the active metabolite of Amifostine (Ethyol), protects in vitro lens epithelial cells against X-ray exposure

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Background: Lens epithelium disorganization is considered as one of the radiation-induced cataract cytopathomechanisms. Epithelial cell death is involved in cataractogenesis process after X-ray irradiation. Our objective was to test the capacity of aminothiol WR-1065, active metabolite of amifostine (or WR-2721) to protect *in vitro* bovine lens epithelial cells against X-ray exposure.

Material and methods: WR-1065 was used for cultures pretreatment at a concentration of 20 μ M. A single dose of 10 Gy was delivered using a dose rate of 2 Gy/min. To evaluate radioprotective effect we used cold light cytoflurimetric assays. Cell viability and membrane damage were evaluated with neutral red probe assay. To evaluate cell proliferation, we used Hoechst 33342 probe (HO) assay followed by an inverted fluorescence microscopic examination for nuclear apoptotic morphology changes of the HO-labeled cells. Monobromobimane probe assay was used for GSH pool evaluation.

Results: Twenty-four hours after irradiation, WR-1065 pretreated cells showed a significant increase of the GSH levels, which was associated with an improvement of cell viability, a decrease of the HO fluorescence and a reduction of the proportion of cells with nuclear changes related to apoptotic cell death. The difference was also significant at 48h and 96h after exposure. Statistical analyses showed a highly significant difference between irradiated and control cultures.

Conclusion: In this study, using cold light cytofluorimetric assays, we showed that WR-1065, can protect *in vitro* lens epithelial cells from X-ray injury. The fluorimetric assays revealed better cell viability, fewer nuclear changes related to *apoptosis* and an increase of the GSH pool in the pretreated cells as compared to non pretreated cells. Thus, we postulate that amifostine is potentially interesting in the view of lens protection against radiocataractogenesis.

524 POSTER

Radiotherapy vs. radiotherapy + chemotherapy of advanced cervical cancer (IIb - IVa): Regression of tumour and early sequelae

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A prospective randomised Study of 200 patients with advanced cervical cancer (st. IIb IVa) treated with ether radio-therapy alone (RT group) or radiotherapy + chemotherapy (RT + CH group) was started at the beginning of May, 2002 and the last patient of this series was treated in March 2003. (Project N° 1683 of Ministry of Science, Technology and Development of Rep. Serbia). The aim of this study is to show comparison of results of treatment of advanced cervical cancer using ether RT or RT + CT.

Clinical material of 200 cervical cancers randomised in two groups: RT 98 (49%) pts and RT + CT 102 (51%) pts. Distribution of patients by stages (FIGO), hystopatological type (and gradus) and age was very similar in both groups.

Treatment regimes were:

1. RT group: - CBT 46Gy/22 fractions, 2 parallel oposite fields without central Pb shields + HDR brachytherapy 5x7 Gy/.A (Ut. tube + 2 vag. ovoids)
2. RT + CT group: RT vs. first group + CT using cisplatin (5 cycles during radiotherapy, one's week).

525 POSTER

Evaluation of polymer gels and laser-beam optical CT scanner as a 3-D dosimeter for IMRT

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Purpose/objctive: Dose distributions generated from IMRT treatment planning present high dose gradient regions in the boundaries among target and surrounding critical organs. Dose accuracy in these areas can be critical, and may affect the treatment. With the increasing use of IMRT in radiotherapy, there is an increased need for a dosimeter that allows high resolution, precise, and accurate determination of 3-dimentional dose distributions. In this study, 3-D dose verification for IMRT has been implemented using polymer gel dosimeters and a laser-beam optical CT scanner.

Material and Methods: A 17 cm diameter x13 cm height plastic cylinder filled with BANG® polymer gel, modified to optimal dose-response characteristics, was used for IMRT dose verification. The cylindrical gel phantom was immersed in a 24x24x20 cm water tank for IMRT irradiation. The irradiated gel sample was then mounted in the prototype optical CT scanner developed by MGS Research Inc., utilizing a single He-Ne laser beam and a single photodiode detector. Similar to the CT process, filtered backprojection was used to reconstruct the 3-D dose distribution. The gel was scanned using 20x20 cm field of view and 200x200 image matrix, which produced 1 mm pixel resolution. Image slices were acquired 1mm apart. The dose distributions measured from the gel was compared with those from the IMRT treatment planning system. For comparative dosimetry, a solid water phantom of 24x24x20 cm, having the same geometry as the water tank for the gel phantom, was used for radiographic film and ion chamber measurements.

Results: Comparison of planar dose distributions among gel dosimeters, film, and a treatment planning system showed that the isodose lines agreed to within 2 mm on transverse and coronal slices. Absolute point-dose verification was performed at 5 different points, varying from 65% to 110% of the prescribed dose. Comparing ion chamber measurements and the dose calculation from the treatment plan, the agreement was found to be within 3%.

Conclusions: Polymer gel dosimeters and laser-beam optical CT scanner provides a high resolution, accurate, 3-dimentional tool for IMRT dose distribution verification.

526 POSTER

Circulating lipid peroxide, glutathione and nitric oxide levels in cancer patients irradiated on different anatomic fields

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Background: Irradiation is known to produce free radicals that damage cells. The effect of ionizing radiation on surrounding normal cells may differ in various irradiated sites. The aim of this study was both to evaluate the effect of radiotherapy (RT) on plasma malondialdehyde (MDA) level as the last step of lipid peroxidation, glutathione (GSH) and nitric oxide (NO) levels of cancer patients treated on different RT field localizations, and to compare the results with control subjects.

Material and Methods: A prospective, controlled study was designed to examine the influence of different irradiation portals.The study design was approved by the Ethics Committee of our University. The effect of RT on MDA, GSH and NO were evaluated in the irradiated cancer patients (n=89), mean age 51.24 years and control subjects (n=33), mean age 52.61 years. The grouping of the irradiation procedure was: Group 1 (n=12) head & neck RT, group 2 (n=13) thoracic RT, group 3 (n=32) breast RT, group 4 (n=17) abdominal RT, group 5 (n=15) pelvic RT. There were two blood samples collected from patients before receiving radiotherapy and the next day after the completion of the fifth week of radiotherapy. Serum was seperated by centrifugation and stored at -20 °C until further assay. MDA and GSH levels were measured by spectrophometrical, and NO levels were measured by Gress' method.

Results: When compared to control, MDA levels of all cancer patients before irradiation was initiated were found significantly higher in all groups (Mann Whitney U, $p<0,05$). After RT, the levels of MDA were found significantly increased by thoracic, breast, abdominal and pelvic irradiation (Wilcoxon signed rank test, $p<0,05$). Although pretreatment NO levels of all cancer patients in all groups were found significantly higher than control