

groups. The logrank test showed a significant difference between ages ($\chi^2 = 21.023$, 6 df, $P = 0.002$) but the logrank test for linear trend was not significant ($\chi^2 = 0.242$, 1 df, $P = 0.62$). In conclusion, it is clear that in this study late toxicity occurrence was not related to age.

176 POSTER QUALITY ASSURANCE USING PORTAL IMAGING: THE ACCURACY OF PATIENT POSITIONING IN IRRADIATION OF BREAST CANCER

O. Pradier, H. Bouscayrol

Klinik für Strahlentherapie Göttingen, Germany

CHU de Poitiers, France

Purpose: To study the accuracy of patient positioning in irradiation of breast cancer.

Methods and Materials: In 31 women with breast cancer portal images were obtained using a fast electronic megavoltage radiotherapy imaging system. Quantitative analysis of 508 megavolt portal images and comparison with 31 digitized simulation films were performed.

Results: Concerning patient positioning in the field, mean standard deviations of the difference between simulation and treatment images were in mm 3.03 for the central lung distance, 3.09 at +4 cm, 3.29 for the central irradiated width, 3.05 for the central beam edge to skin distance, 4.11 for the craniocaudal distance. Maximal variations of standard deviations were respectively 1.72–5.97; 1.92–4.78; 1.20–5.99; 1.06–5.11; 0.98–6.09.

Conclusion: The tangential breast treatment set-up is very stable and reproducible. The Electronic Portal Imaging Device appears to be an adequate tool to study the accuracy of treatment set-ups with this method.

177 POSTER THE ACCURACY OF PATIENT POSITIONING IN IRRADIATION OF RECTUM CANCER

O. Pradier, H. Bouscayrol

Klinik für Strahlentherapie Göttingen, Germany

CHU de Poitiers, France

Purpose: Evaluation of correct positioning using an ionisation chamber on-line portal imaging system in routine clinical radiotherapy of rectum cancer.

Methods and Materials: In 13 patients with pelvic irradiation, portal images were obtained using a fast electronic megavoltage radiotherapy imaging system. A total of 208 portal images and 13 simulator films were used to determine the values of setup deviations in the X-Y-directions and the rotation of fields in a fixed coordinate system, and the accuracy of the manually positioned blocks.

Results: Mean standard deviations of the difference between simulation and treatment images were in mm: 7.33 and 7.13 for X and Y, 3.55 for the rotation fault, and 4.55 for the position of blocks. Maximal variations of standard deviations were respectively 2.29–11.91; 2.39–7.83; 1.84–7.07; 1.17–10.09.

Conclusion: The errors of field positions summed up to a mean of up to 11.91 mm in one patient. Maximal errors counted in single fields up to 30 mm. The mean error of manual block positioning was not acceptable. Thus, mechanically fixed blocks are now used after obtaining the results of this study. A daily control should be considered for difficult patients.

178 POSTER CONCURRENT RADIATION THERAPY AND CHEMOTHERAPY (CARBOPLATIN/5-FLUOROURACIL) IN ADVANCED CANCER OF THE UTERINE CERVIX

E. Pras¹, P.H.B. Willemse², H. Boonstra³, M.A.A.M. Heester¹, E.G.E. de Vries²

¹Departments of Radiotherapy, ²Med. Oncology, and ³Gynecol. Oncology, University Hospital Groningen, The Netherlands

Aim: Combining RT and CT aiming at a better local control and disease free survival.

Materials and Methods: From April 1989 till January 1994, 74 patients (pts), with bulky stage IB and/or IIA (12), IIA/B (44) and IIIA/B (18) cervical cancer were treated with external radiation therapy (45 Gy in 1.8 Gy fractions) followed by 2 × 17.5 Gy brachytherapy or 25 Gy external boost. This was combined with 3 cycles of Carboplatin 300 mg/m² i.v. day 1 and 5-FU 600 mg/m² over 24 hrs day 2–5, q 28 days. Six weeks after treatment additional hysterectomy was performed when feasible, otherwise multiple biopsies were taken. Histology: 60 pts squamous,

3 adenosquamous, 5 small-cell squamous, 2 small-cell neuroendocrine and 4 adenocarcinoma.

Results: The median follow-up is 48 months (range 16–67 months). Seventy-three pts are evaluable. In 43 pts a hysterectomy was feasible: 28 showed pCR and 25/28 are NED; 1 died of complications and 2 pts of metastasis. In 15/43 pts tumor cells were found: 4 died of metastasis and 11 are NED. In 29 pts only biopsies were taken: 6 showed tumor cells and 5/6 died; in 23/29 there was pCR with 14 pts NED, 5 pts died of local ± distant disease and 4 pts of distant disease. In 1 patient no histology is available: she died of distant disease. Twenty-two out of 73 pts relapsed: 11 locally (3 distant also) and 11 distant only. So the local control is 85%. All local relapses occurred <1 yr. The overall survival at 4 yrs is 68% (st IB-IIA 75%; st IIB 75%; st III 47%). All 74 pts completed therapy. Leucopenia gr.I (WHO) occurred in 18, gr.II in 34, gr.III in 20 and gr.IV in 2 pts. Thrombocytopenia gr.I occurred in 58, gr.II in 12, gr.III in 1 and gr.IV in 2 pts. No bleeding or leucopenic fever occurred. G.I. toxicity was mild. Severe late toxicity is similar as with radiation therapy alone. These good results on local control and survival are now the basis for a randomized study we started.

179 POSTER PREVENTION OF ORAL MUCOSITIS IN HEAD AND NECK RADIATION THERAPY

J. Ferre¹, A. Rovinsky², M. Bondia¹, F. Ferrer², A. Biete²

¹Oral medicine Unit, School of dentistry, University of Barcelona

²Radiation Oncology Department, Hospital Clinic Universitari, Barcelona, Spain

The purpose is to evaluate the effectiveness of a protocol to prevent oral mucositis, an usual complication of head and neck radiotherapy. This protocol consists of a previous oral cavity examination, mouth hygienization, infectious focuses removal and administration of chlorhexidine, sucralfate and benzydamine mouthwashes. A retrospective study was made on 45 patients that received radiotherapy, 19 of them started without prevention and the others 26 were controlled since the beginning. Mucositis level was evaluated every week following the OMS criteria. U-Mann-Whitney test was used to compare the two groups. Statistical significant differences were found between both ($P = 0.0001$). Median value mucositis in the prevention protocol (PPG) and no prevention protocol groups were 0 and 1 respectively. The differences were more important between the 3th and 5th weeks. Tolerance treatment was better in PPG.

180 POSTER SIMULATION BY A DIAGNOSIS CT IN THE VOCAL CORD CARCINOMA. PRELIMINARY RESULTS IN TEN PATIENTS

A. Rovinsky, J. Berenguer¹, F. Ferrer, J. Casals, A. Sánchez-Reyes, C. Arias, B. Farrús, J. Traserra

Radiation Oncology Department

¹Radiology Department and Head and Neck Surgery Department, Hospital Clinic i Universitari de Barcelona, Spain

To optimize the radiotherapy of the vocal cord carcinoma we started their simulation by a diagnosis CT. Since June 1994 to February 1995 ten patients were simulated and treated. With a thermoplastic mask the patients were referred to the radiology department. Some real size CT slices every 2 mm were obtained in the treatment position. The center, dimensions and limits of the fields were established in the CT room. After, a dosimetric study was performed in our department. We found anatomical differences in each patient that had repercussion in the treatment approach (location and size of the vocal cord and contour of the neck). This procedure allowed us the selection of the best radiotherapy approach for each patient. We report the advantages of this technique for each patient and we describe the rules for this simulation technique.

181 POSTER RADIATION-INDUCED PNEUMONITIS DUE TO POSTOPERATIVE IRRADIATION FOR BREAST CANCER—INCIDENCE AND RISK FACTORS

F. Saran, I.A. Adamietz, C. Thilmann, S. Mose, S. Tieku, S. Jäkel, B. Schopohl, H.D. Böttcher

Department of Radiotherapy and Oncology, University of Frankfurt, Theodor-Stern-Kai 7, 60590 Frankfurt, Germany

Objective: Radiation-induced pneumonitis (RIP) is an acute side effect in 5–57% of patients postoperatively irradiated for breast cancer. Pulmonary fibrosis and spontaneous pneumothorax can be late sequelae resulting from RIP. Clear dose response curves exist for single dose lung