(table 1). There was, however, a significant negative correlation between S-phase-fraction and pO_2.

Conclusions: Fast proliferating tumors have a lower pO_2 However, the initial pO_2 seems to be the strongest predictor for response to radiotherapy in cervical cancers.

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Functional and structural immunodefects after limited volume radiotherapy

C. Belka[1], H. Ottinger[2], M. Weinmann[1], E. Kreuzfelder[2], W. Budach[1], H. Grosse Wilde[2], M. Bamberg[1]. [1]*Dept. Radiation Oncology, Univ. Tübingen;* [2]*Dept. Immunology, Univ. Tübingen, Germany*

Purpose: The effect of limited volume irradation on the function of the human immunosystem has not been well documented. In a prospective study structural and functional aspects of the immunosystem were analyzed in 15 patients receiving a 26 Gy course of periaortal irradiation for stage I testicular seminoma

Methods: Immunophenotyping of penpheral lymphocytes (CD3, CD4, CD8; CD19, CD45RA, CD45RO, CD45RA, CD56, CD25, HLA-DR, CD34), lymphocyte transformation test (LTT) with mitogens (PHA, Con A, Okt3, Leu4, PWM) LTT with antigens (tuberculin, mumps, measles, rubella, varizella, HSV, influenza A, CMV, tetanus, candida, diphtheria) was performed at 0 Gy, 14 Gy and 26 Gy as well as 6 and 16 weeks after RT.

Results: All lymphocyte populations are reduced during and after radiotherapy. CD 19 pos. B-Lymphocytes and CD45RA positive naive cells are most sensitive. NK are more resistant. No significant alterations in lymphocyte reactivity towards mitogens and antigens was seen.

Conclusion: Although RT leads to an significant reduction in peripheral lymphocyte counts no functional impairments could be detected. Furthermore, most lymphocyte subsets recover to low normal levels 16 weeks after RT.

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Low dose irradiation for macular degeneration

R.H. Sagerman[1], W.V. Delaney, Jr.[2], P.F. Torrisi[2], G.R. Hampton[2], S.C. Spaulding, III[2], R.K. Rutledge[2]. [1]*Department of Radiation Oncology, SUNY Health Science Center, Syracuse, NY;* [2]*Retina-Vitreous Surgeons of CNY, Syracuse, NY, USA*

Aim: To determine the response of macular degeneration to low dose external beam irradiation and the acute and late morbidity on the eye.

Methods: Forty-seven patients (49 eyes) meeting stringent ophthalmological criteria underwent low dose irradiation delivered with a 6 MV linear accelerator to 1600 cGy in 8 equal fractions through an ipsilateral anterior oblique field angled 7°–10° posteriorly from June to December 1996. Ophthalmological evaluation was accomplished at 1, 3, 6, 9 and 12 months later.

Results: There was no acute or late toxicity. Visual acuity stabilized for most patients. Subjectively, 9 reported improvement and 4 slight worsening of vision but this did not always agree with objective acuity measurements. Edema and hemorrhage decreased or disappeared in the majority, with only 1 patient showing new areas of hemorrhage.

Conclusion: 1600 cGy causes regression of hemorrhage and edema, with stabilization of vision and without toxicity in the majority of patients. The results of a detailed ophthalmological review in progress will be presented.

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Current practice in early breast cancer post-operative irradiation: An Italian survey

R. Valdagni[1], M. Amichetti[2], M. Ciocca[1], V. Vitale[3]. [1]*Dept. of Radiation Oncology, Casa di Cura S. Pio X, Milan;* [2]*Dept. of Radiation Oncology, S. Chiara Hospital, Trento;* [3]*Dept. of Radiation Oncology, IST, Genova, Italy*

Purpose: To evaluate the present radiotherapy (XRT) management of early breast cancer (EBC), a questionnaire on adopted radiation parameters was sent to all XRT Departments of Northern Italy. This survey is also aimed at helping in the definition of national guidelines for the EBC post-operative XRT.

Methods: 50 XRT Departments received a questionnaire on specific aspects related to pre-treatment evaluation, treatment prescription, treatment preparation and execution for whole breast and tumor bed XRT, surgery-radiation-chemotherapy combination and follow-up. Analysis of variables and comparison with the European standards were performed.

Results: 37 out of 50 (74%) questionnaires, regarding ~5,500 patients treated per year, returned. A general agreement between Departments was found on main XRT aspects (total dose delivered to whole breast, basic XRT technique, beam modifiers, patient position, acute and late toxicity recording, etc.). Data dispersion was mainly noted on simulation and treatment planning procedures and quality of boost irradiation.

Conclusions: This survey evaluates the current practice of irradiation for EBC in Northern Italy. Results are generally in agreement with the European standard of reference (EORTC-EUSOMA Consensus document, 1991). However, several parameters need to be standardized and all these information represent the background to define national guidelines adapted to the Italian situation and resources.

The authors thank the radiation oncologist and medical physicists of the Depts participating in the survey. Without their cooperation this study could not have been performed.

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Locally advanced and metastatic thyroid cancer – 15-year results of adjuvant or palliative external beam radiotherapy

M.H. Seegenschmiedt[1,5], A. Altendorf-Hofmann[2], W. Becker[3], C. Wittekind[4], R. Sauer[1]. [1]*Department of Radiation Oncology,* [2]*Department of Surgery,* [3]*Department of Nuclear Medicine,* [4]*Department of Clinical Pathology, University Erlangen-Nürnberg;* [5]*Alfried-Krupp Krankenhaus Essen, Germany*

Purpose: The role of postoperative external radiotherapy (RT) for thyroid cancer is still controversially discussed. We have analyzed long-term local control, systemic response and prognostic factors in patients with locally advanced, recurrent or metastatic disease.

Methods: Between 1976–1992, 121 out of 483 consecutive patients (46 m., 75 f.) with histologically proven thyroid carcinoma (papillary, n = 31; follicular = 40; medullary = 21; undifferentiated/anaplastic = 24; and other tumors = 5) received RT and were followed for a median of 7.5 years. Prior therapy was surgery (92) and radio-iodine therapy (63). The RT was indicated for advanced papillary/follicular T4/N+ tumors, macroscopic tumor burden after resection and unfavourable histologies. All cases were stratified into 3 groups according to tumor burden prior to RT: R1 resection of primary tumor (n = 33); R2 resection or locally recurrent tumor (46), or metastatic tumor burden (42). RT was applied to tumor and lymphatics or metastatic site with 2 Gy single dose up to 40–60 Gy total dose.

Results: Complete (CR) and overall response (CR/PR) was 100% and 100% respectively in group 1, 61%/55% in group 2, 33%/17% in group 3. In the latter groups, relief of tumor-associated symptoms was achieved in 68% (group 2) and 58% (group 3). Treatment toxicity WHO 2°/3° occurred in 5%. In long-term analysis, loco-regional progression or relapse occurred in 18% (group 1), 46% (group 2) and 83% (group 3) ($p < 0.001$). The 5- and 10-year disease-free-survival rates were 83% and 78% respectively for group 1, 48% and 42% (group 2) and 24% and 15% (group 3) ($p < 0.05$). In univariate analysis, tumor burden, initial CR, histology (papillary and follicular) and gender were positively correlated with long-term relapse- and disease-free survival. Even patients with metastatic disease achieved long-term survival when initially presenting with a single metastatic site.

Conclusion: Postoperative RT is effective in managing locally advanced thyroid cancer.

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Radiotherapy with carbogen breathing and nicotinamide in locally advanced non-small cell lung cancer (NSCLC)

A.A. Yavuz, I.L. Atahan, F.H. Akyol, M. Yavuz, A.F. Zorlu. *Department of Radiation Oncology, University of Hacettepe, Ankara, Turkey*

Purpose: Combining radiotherapy (XRT) with carbogen (C) and nicotinamide (NAM) has been proposed as a strategy to overcome acute and chronic hypoxia. The feasibility, toxicity and influence on local control of this treatment was tested in locally advanced, non-small cell lung cancer patients (pts).

Methods: Between January 1996–June 1996, 38 pts were randomised: 21 pts to radiotherapy alone (XRT) and 17 pts to radiotherapy + carbogen + nicotinamide arm (XRT + C-NAM). All patients received XRT with fractionation scheme in daily fractions of 3.2 Gy, five days/week up to 14 fraction in XRT arm and 12 fraction in XRT + C-NAM arm. Thus, Biological Equivalent Doses (BED) were reduced by %9 for normal lung tissue and %23 for medulla spinalis in XRT + C-NAM arm.

Results: In general, C-NAM was well tolerated. There was no difference between two arms regarding grade III–IV acute toxicities ($p = 0.475$). In