of 14 months, Breslow $p < 0.04$; progression free survival: median of 13 months vs median of 4 months, Breslow $p < 0.01$).

Conclusion: In patients with progressive metastatic renal cell carcinoma, outpatient chemo immunotherapy with SC Interleukin-2, SC Alpha-2a-interferon, and IV 5-FU is more effective (objective response rate, progression free survival, and overall survival) than single agent tamoxifen

152 ORAL

Survival in renal cell carcinoma (RCC) – A randomised evaluation of tamoxifen versus interleukin-2, α-interferon (leukocyte) and tamoxifen

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Purpose: Biotherapy causes encouraging results in terms of objective responses. No conclusive studies exist with a controlled evaluation of survival in advanced RCC. The aim was to compare IL-2/IFN-α with relatively atoxic tamoxifen (T).

Methods: Randomized multicentre study (life expectancy >3 months, PS WHO 0–2). Interim analysis when 100 patients evaluable. The control patients (n = 63) received only tamoxifen 40 mg p.o. daily. The other patients (n = 65) subcutaneous IL-2/IFN-α in two treatment cycles of 42 days (see Atzpodien) and maintenance treatment (5 days, every 4 weeks) 1 year or until progression. Two patients in the T only group received biotherapy when the disease progressed without any effect. The patients received appropriate local treatment.

Results: The interim analysis showed no advantage for either group. Inclusion of patients was stopped. Mean follow-up: 11 months (range 0.4–48). The final survival analysis displayed no differences from the day of primary diagnosis, first evidence of metastasis, or from the onset of treatment. This was valid with regard to intention to treat or when directed *only* to patients that managed at least one treatment cycle of IL-2/IFN-α. CR was seen in both groups. Adverse effects were pronounced in the IL-2/IFN-α group.

Conclusions: The results raise doubt about IL-2/IFN-α as a routine treatment in advanced RCC. Difference in expenses of drugs and health care (drug costs/patient: IL-2/IFN- α 27,000$ vs Tamoxifen 360$) and quality of life are also of importance. The study emphasizes the need of further controlled studies.

153 ORAL

Testis cancer: Carcinoma-in-situ in testes with germ cell tumour

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Testicular tissue of 380 consecutive patients (169 Seminoma and 211 NSGCT) from 1990 to 1995 has been examined in semithin sectioning technique adjacent and distant to solid germ cell tumours. The samples were fixed in glutaraldehyde and osmium tetroxide then embedded in Epon. Semithin sections (1 μm) were stained with toluidine blue-pyronine. 303 (80%) patients showed CIS in biopsies near or distant of the tumour. Of 327 testes either tumour-near as -distant biopsies were examined. CIS was found in 262 testes tumour-near (80%), in 206 tumour-distant (63%) and both in 196 (60%). CIS only tumour-near showed 65 (20%), only tumour-distant 10 testes (3%).

In 78% of seminomas CIS was found tumour-near and in 54% tumour-distant, of non-seminomas in 86% -near and 67% -distant.

A weak statistically significant relationship between tumour size and occurrence of CIS in the biopsies is demonstrated.

As long as no prospective parameters of high probability are established, every testicle with a germ cell tumour should be respected as CIS-contaminated. The individual decision for radiation or surveillance after organ-preserving surgery depends on the patients intention regarding the fertility. Not to develop a solid tumour in future, testes which have CIS should be irradiated.

154 ORAL

Early stage testicular seminoma – A prospective multicenter trial

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Purpose: Adjuvant radiotherapy in stage I, IIA/B testicular seminoma (Royal Marsden Classification) offers cure rates of 95% and 80–90%, respectively. However, treatment volume and total dose are still object of discussion. Thus, we conducted a multicenter prospective clinical trial for radiotherapy of early stage testicular seminoma with reduced total treatment doses and portals.

Method: Patients with stage I (CSI) seminoma received radiotherapy to the paraaortic lymph nodes only. Treatment portals reached from the upper border of thoracic vertebra 11 (T11) to the lower border of lumbar vertebra 4. Stage IIA/B (CSIIA/B) patients were treated to the paraaortic and ipsilateral iliac lymph nodes. A hockey stick field stretched from the upper border of T11 to the upper border of the ipsilateral acetabulum. Total dose in 2 Gy daily fractions was 26 Gy for CSI, 30 Gy and 36 Gy for CSIIA/B, respectively.

Results: Between 4/91 and 3/94 827 patients were entered into the trial. 492 patients with CSI disease and 59 patients with CSIIA/B disease were eligible for an interim analysis in 12/96. Mean follow up was 28 months. In CSI and CSIIA/B there were 18 (3.7%) and 2 (3.4%) relapses, respectively. No in-field recurrence was observed. 18/20 patients were salvaged. One patient died of embolism after surgery for relapse, a second patient was lost to follow up after diagnosis of recurrent disease. Overall survival (28 months follow up) accounts to 99.6% in CSI and 100% in CSII. Acute side effects of adjuvant treatment were moderate. 59% of all patients suffered from nausea, 14.9% experienced diarrhea during treatment.

Conclusions: Low dose radiotherapy with reduced portals in early stage testicular seminoma yields high cure rates with only moderate acute side effects.

155 ORAL

Lessons from prospective multicenter study on seminomas

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Purpose: We conducted a prospective multicenter study to assess the prognostic value of HCG in seminomas.

Methods: From 1986–1991 we recruited 806 seminomas from 96 urological departments in FRG. Austria, Switzerland, 726 were evaluable. 288 of these cases were retrospectively reviewed from 14 of the participating hospitals (all seminomas of the same time period) because the original idea to compare the results with historical series, proved to be insufficient. The outcome after standard therapy (radiotherapy in stages IIB and chemotherapy in more advanced stages) was established. Univariate and multivariate analyses were performed in order to assess adverse prognostic factors.

Results: In the cubital vein, the incidence of HCG is 35%, of LDH and PLAP 34% and 56% resp. 84% of all seminomas are marker positive. Nearly all seminomas produce HCG, in most cases it is measurable only in the testicular vein. HCG is associated with tumor mass but it has no prognostic relevance. Multivariate analysis revealed metastatic disease, pT > T, LDH and its prolonged marker decay as prognostic factors, multivariate analysis pT > T and metastatic disease. Stage II B disease showed a poorer outcome after radiotherapy than more advanced stages after chemotherapy.

Conclusion: Elevated HCG has no influence on the prognosis of seminomas. This fact results in a stage related uniform therapy for HCG positive and negative seminomas. Stage II B disease should probably be better managed by chemotherapy.

156 ORAL

Long-term survival and late toxicities after high-dose chemotherapy in patients suffering from germ cell cancer

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Purpose: High-dose chemotherapy (HDCT) followed by autologous stem cell rescue can cure patients suffering from refractory or relapsed germ-cell

cancer. However, the long-term results and the late toxicities are still unknown.

Methods: Between 8/89 and 9/95, 150 patients with a median age of 31 years (range: 18 to 55 years) with refractory or relapsed germ-cell tumors received HDCT containing carboplatin (1,500 to 2,000 mg/m^2), etoposide (1,200 to 2,400 mg/m^2) and ifosfamide (0 to 10 g/m^2). Thereafter patients were re-evaluated every three months during the first year and every 6 months during subsequent years.

Results: After a median follow up time of 50 months (range: 17 to 88), 149/150 patients were assessable, one patient was lost for follow up. In November 1996 all patients were censored; 60/149 (40%) patients were still alive. Among the survivors 35 (24%) patients were in CR or had become free of tumor after additional surgery, 18 (12%) patients achieved an unresectable markernegative partial remission, and 7 (5%) patients were in markerpositive partial remission or had progressive disease. Nephrotoxicity was observed in 17 (28%) patients, peripheral nervous toxicity in 24 (38%) patients, auld hearing impairment in 16 (26%) patients. Three patients acquired a hepatitis B or C during HDCT, one patient is alive with hemodialysis and another patient developed aseptic necrosis of the right femoral head after HDCT.

Conclusion: The short- and long-term evaluation data demonstrate the efficiency of HDCT as well as acceptable chemotherapy induced late toxicities in patients with refractory or relapsed germ cell cancer.

157 ORAL

Long-term effects of testicular cancer treatment on sexual functioning

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Purpose: To evaluate the influence of combined treatment modalities on sexual functioning and fertility potential in patients cured from testicular cancer.

Methods: Aspects of sexuality and fertility were assessed by questionnaires in 98 testicular cancer pts being in CR for at least 12 months. 19 pts (19%) had seminomatous, 79 (81%) non-seminomatous germ cell tumors, median age 28 years (19–53). Treatment included surgery alone in 17, platin-based chemotherapy (ctx) alone in 30, radiotherapy (rtx) alone in 5, combination of ctx ± rtx ± surgery in 46 pts. Median time interval between time of interview and end of treatment was 78 mon (18–169).

Results: *Fertility:* 39 (44%) were parents before therapy. No pregnancy occurred during treatment. 22 (25%) farthered children at a median of 54 mon after the end of treatment (3–108). In 19 pts pregnancy was not achieved with 15 of 19 pts having pathological semen analysis, 2 pts suffering from psychosocial distress, 1 pts with dry ejaculation and in one case the spouse did not want children. *Sexual problems/emotional distress:* The frequency of intercourse significantly decreased during the treatment, but afterwards recovered almost completely. 8% of pts reported dissatisfaction with sexual life before diagnosis of testicular cancer and 4% had experienced reduced libido and erectial difficulties. At the time of the interview significantly more pts (24%) reported an unsatisfactory sexual life and libido or erectial difficulties (19%) compared to the pretreatment situation. Increased age at the time of diagnosis, psychological distress before diagnosis and using of more than one treatment modality tended to correlate with a higher incidence of sexual problems.

Conclusion: Long-lasting sexual problems after therapy for testicular cancer are found in nearly a fifth of pts. From 41/98 testicular cancer pts wishing children 22 (54%) became parents. 19 pts were identified to be infertile and in 16 of these possibly treatment-related alterations were detectable.

158 POSTER*

Telomerase activity and telomere length in testicular cancer tissues and residual tumor mass after cisplatin based chemotherapy

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Activation of the ribonucleoprotein enzyme telomerase has been associated with immortalization and cancer. Thus, telomerase has emerged as a novel target for chemotherapy. We have previously shown that the antineoplastic agent cisplatin is capable of inhibiting telomerase activity in testicular cancer cells *in vitro* and proposed that the effect might contribute to cisplatin's marked efficacy against germ cell derived tumors. In this study, we examined whether the hypothesis might be operative in a clinical case scenario. The telomeric repeat amplification protocol and mean terminal restriction fragment (TRF) length analysis were used to study telomerase activity and telomere length in normal testes, testicular tumors, and residual mass after cisplatin therapy. Tissues were microdissected prior to enzyme extraction to investigate enzyme activity and TRF-length in relationship to different pathologies. Telomerase activity was measured in concentrations between 6–0.06 μg of total cellular protein and teratoma cell line SUSACP used as positive control to allow quantification. Eighteen of 25 samples had telomerase activity, 16 of which were germ cell tumors and 2 were normal testes. Activity was high in tumors, but only moderate in normal tissue. Telomerase was not detected or very low in necrotic testicular germ cell tumors and lymph node metastases after therapy and in differentiated teratomas. Accordingly, telomeres were significantly shorter in such cases compared with untreated seminomas or undifferentiated teratomas. Our data demonstrate that clinical response to cisplatin based treatment regimens is paralleled by telomere shortening and absence of detectable telomerase activity. Measurement of telomerase activity may be a useful predictor of response to therapy.

159 POSTER*

Germ cell tumor (GCT): Staging and therapy control with ^{18}FDG-PET. First results of German multicenter trial

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Purpose: We have studied the value of PET as a staging method in pts with GCT before and after therapy in a prospective multicenter study.

Method: 54 pts with seminoma (18) and non-seminomatous tumor (36) were included in the study. In total 77 FDG-PET were performed, 27 at diagnosis, 50 after therapy, with a median of 34 days after treatment (range 13–122). So far 28 pts are validated, 28 with tumor marker profil, 23 with both, PET and tumor marker. Follow up for more than 6 months (11) (median 13 months, range 8–23) or histological examination (12) or was used for validation.

Results:

	True positive	False positive	True negative	False negative	Sensitivity	Specificity
PET	13	3	6	1	93%	66%
AFP/HCG	4	0	6	9	30%	100%

Conclusion: PET is a sensitive but non-specific method for predicting vital tumor, while tumor marker are more specific. The reason for the low specificity of PET is not yet fully understood, but might be due to an inflammatory process after chemotherapy. Perhaps this problem can be solved by extending the interval between the end of therapy and PET.

160 POSTER*

Prognostic risk factors in low stage testicular nonseminomatous germ cell tumors (NSGCT)

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Purpose: Since optimal therapy for clinical stage I (CS I) NSGCT still remains controversial, we examined the clinical utility of histopathological and biological prognostic markers to stratify the risk of occult retroperitoneal disease.

Methods: Orchiectomy specimens of 149 CS I NSGCT (86 PS I, 63 PS II) were chosen for immunohistochemical analysis of p53, bcl-2, MIB-1, cathepsin D and e-cadherin expression and specimens were also reviewed for presence of vascular invasion (VI) and percentage of embryonal carcinoma (%EC). Uni- and multivariate logistic regression models were used for statistical analysis.

Results: Combination of VI and % EC was the most significant prognosticator to predict path. stage II ($p < 0.0001$) by multivariate analysis. Using cut-off values of <45% EC and VI– path. stage I was correctly predicted in 88% (68/77) with a negative predictive value of 92%. Cut-off values of >80% EC and VI+ correctly predicted path. stage II in 85% (41/48) with a