Material and methods: 110 patients were entered onto the study: 78 (71%) received definitive CRT with a median dose of 70 Gy to the prostate (64.8–74 Gy) and 32 (29%) received adjuvant CRT after radical prostatectomy with a median dose of 59.4 Gy (55.9–64.8 Gy). QoL, rectal toxicity, and fecal continence were assessed before CRT, during CRT at 40 Gy and 60 Gy and 8 weeks and 12 months after CRT. The following standardized questionnaires were used: the EORTC quality of life questionnaire C30, the prostate cancer module QLQ-PR25, an 8-item rectal toxicity score (RT-TOX), and the Wexner fecal continence score.
Results: Global QoL did not change significantly during CRT, 8 weeks after treatment the values were above the baseline ($p = 0.013$). The following QoL scores significantly deteriorated during therapy and then returned to the baseline after CRT: role functioning, fatigue, diarrhoea, urinary symptoms, and sexual activity. Emotional functioning improved during and after therapy and the 2- and 12-months-values were significantly above the baseline. PR-25 fecal symptoms, RT-TOX and the fecal continence score significantly increased during CRT. All three scores recovered slightly 8 weeks after CRT without reaching baseline levels and subsequently deteriorated again one year after treatment. RT-TOX and the fecal continence score correlated inversely with global quality of life 12 months after CRT ($\rho = -0.48$ and $\rho = -0.31$, respectively, $p<0.001$). Neither neoadjuvant hormonal therapy nor treatment indication (definitive vs. adjuvant CRT) was associated with RT-TOX, fecal continence or global quality of life.
Conclusions: A decrease in quality of life parameters during CRT is mostly transient and affects only a limited number of QoL domains. Especially global quality of life does not deteriorate during or after treatment. The PR-25 fecal symptom score, the rectal toxicity score and the fecal continence score display a similar time course: following a slight improvement 8 weeks after treatment the scores deteriorate again 12 months after CRT probably reflecting the onset of chronic toxicity. Impaired fecal continence, although mostly mild, must be regarded as an acute as well as a late side effect of CRT.

814 POSTER

Impact of percent positive biopsies on biochemical outcome in prostate cancer patients treated with external beam radiotherapy with or without androgen deprivation

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Background: The primary objective of this study is to identify the prognostic factors for biochemical outcome in patients with prostatic adenocarcinoma treated with external beam radiotherapy (EBRT) with or without androgen deprivation (AD) and to investigate the impact of positive biopsy core percentage in different risk groups.
Material and methods: Between 1998 and 2003, 333 patients diagnosed with prostate cancer were treated with definitive EBRT in the Radiation Oncology Departments of Metropolitan Hospital and Marmara University. Median age was 71 years (range 44–85); 74% had clinically localized (T1–2), 26% had locally advanced (T3) disease. Gleason scores were below 7 in 48%, 7 in 39%, and over 7 in 13%. Pretreatment PSA levels were below 10 ng/ml in 50%, between 11–20 ng/ml in 25%, and over 20 ng/ml in 25%. Perineural invasion (PNI) was present in 31%. Distribution of patients due to risk factors according to D'Amico was as low risk in 21%, intermediate risk in 34%, and high risk in 45%. Of the patients 18% were treated with a 4 field conventional technique, whereas 82% were treated with 4–6 conformally shaped fields. Median prostate dose defined to the periphery was 72 Gy (range 59.4–76 Gy). Androgen deprivation was given to 78% of the patients. Percentage of positive biopsy cores was calculated as number of positive cores in biopsy materials divided by total core numbers. Biopsies from seminal vesicles and nodules were excluded. The median number of cores was 8 (range 6–26). Percentage of positive cores were <33% in 34% of patients, between 33%-67% in 39%, and ⩾67% in 27%. Patients were evaluated every 3–6 months after the completion of radiotherapy. Median number of post-RT PSA counts per patient was 8 (range 3–32). Biochemical failure was defined using the ASTRO consensus definition. Potential risk factors like Gleason score, T stage, initial PSA level, PNI, time on AD, radiation dose, percent of positive biopsies and risk groups were evaluated.
Results: After a median follow-up of 35 months (range 12–91 months), the 5-year biochemical control (BC), prostate cancer-specific survival, and overall survival rates were 83%, 98%, and 88%, respectively. The 5-year BC according to risk groups were 85% for low risk, 88% for intermediate risk, and 79% for high risk patients. For the entire cohort high GS ($p = 0.0042$), high risk group ($p = 0.0281$) and higher percent positive core biopsies ($p = 0.0342$) were significant predictors of reduced biochemical control. In the intermediate risk group BC was 90% vs 74% in the patients with <67% positive cores and >67% positive cores, respectively ($p = 0.036$). On multivariate analysis the only independent predictor for PSA failure was percent positive biopsies.
Conclusions: This trial demonstrated especially in the intermediate risk group that high percent positive biopsies could be an early indicator of biochemical relapse. Those patients may be evaluated as having high risk disease.

815 POSTER

Androgen deprivation for cytoreduction prior to interstitial brachytherapy for early-stage prostate cancer is associated with an increased risk of urinary morbidity

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Background: We previously demonstrated that biculatumide monotherapy (BT) has similar cytoreductive efficacy when compared with luteinizing hormone-releasing hormone analogue monotherapy (LHRHa). Here we assess the impact of androgen deprivation (AD) given for prostate volume reduction prior to brachytherapy on acute and chronic urinary morbidity following implant.
Materials and methods: Between May 1998 and January 2004, 81 patients received AD for the sole purpose of cytoreduction prior to interstitial brachytherapy. 56 patients received a median 3 months of LHRHa (leuprolide 7.5 mg per month or goserelin 3.6 mg per month) and 25 patients received a median 3 months of BT (bicalutamide 50 mg per day). Prostate volume was measured prior to initiating hormonal therapy and then intraoperatively by a single ultrasonographer (CK). Events recorded were:
1. The incidence of urinary retention requiring prolonged catheterization (greater than 1 week)
2. The need for surgical intervention to relieve urinary obstruction
3. The occurrence of long-term incontinence (>6 months) following surgical intervention.

Outcomes were compared to those for a control group of 81 patients who were matched 1:1 based on similar prostate volume (within 1 cc) at the time of implant, but who had not received AD. Median follow-up for all patients was 41 months (range 11–66 months).
Results: Median percent reduction in prostate volume after AD was 30%. There were no statistical differences in urinary morbidity between patients receiving LHRHa and BT. Prolonged catheterization was required significantly more often for patients receiving AD when compared to volume-matched controls (27% vs. 9%, $p = 0.02$). Surgical intervention was required significantly more often for patients receiving AD when compared to volume-matched controls (9% vs. 4%, $p = 0.03$). Long-term incontinence occurred in 3 (4%) out of the 7 patients that had received AD and subsequently required surgical intervention. Long-term incontinence occurred in 1 (1%) out of the 3 patients that had not received AD and subsequently required surgical treatment.

	AD	No. AD	*P*
Median Volume at Implant (cc)	34.0	34.1	0.99
Prolonged Catheterization	27%	9%	0.02
Surgical Intervention	9%	4%	0.03
Urinary Incontinence	4%	1%	0.03

Conclusions: The use of AD for cytoreduction was associated with a significantly increased incidence of prolonged catheterization, need for surgical intervention, and occurrence of long-term incontinence when compared with patients implanted at similar volumes who did not receive AD. This suggests that patients who achieve smaller prostate volumes through the use of AD maintain an increased risk for urinary complications and should be counseled accordingly prior to implant.

816 POSTER

Tolerance of elderly patients (⩾75years) to prostate external beam radiotherapy or brachytherapy

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Purpose: To investigate if patients ⩾75yr are at higher risk of developing toxicity from prostate external beam radiotherapy (EBRT) or brachytherapy

(PB), to examine pre-treatment characteristics for possible selection bias and to investigate toxicity risk factors.
Material and methods: 322 elderly patients (⩾75yr) with ⩾24mo follow-up were eligible for this study: 289 had EBRT (EBRT75+) and 33 had PB (PB75+). A control group of 1353 <75yr patients was used for comparison: 941 had EBRT (EBRT75−) and 412 had PB (PB75). GU and GI toxicity (RTOG scales) were compared among the 4 groups. Pre-treatment factors: diabetes, vascular disease, PSA, Gleason score, T stage, use of hormones were analyzed. IPSS, prostate ultrasound volume were compared between PB75+ and PB75. The above factors were examined for correlation with toxicity.
Results: Age group distributions for elderly patients are: 75−79yr: EBRT-255, PB-32; 80−84yr: EBRT-33, PB-1; 85−89yr: EBRT-1, PB-0. Median follow-ups are: EBRT75+: 57 mo, PB75+: 30 mo vs EBRT75−: 60 mo, PB75−: 30 mo. EBRT75+ have slightly earlier stage (T1−2: 70.2%vs 62.7%; $p = 0.008$) and less hormonal therapy use (37% vs 49%; $p = 0.0004$) comparing to EBRT75−. Pre-treatment factors are similar between PB75+ and PB75−. Toxicity between EBRT75+ and EBRT75− is similar. Toxicity between PB75+ and PB75− is similar except for late grade 3 GI toxicity: 3%(1/33) vs 0.2%(1/412) respectively; $p = 0.02$. There is no grade 4 toxicity. PB75+ has more grade ⩾2 GU toxicity (acute: 46.9% vs 29.4%; $p = 0.04$; late(30 mo): 42.4% vs 9%; $p < 0.0001$) but less grade ⩾2 GI toxicity (acute: 9.4% vs 49.8%; $p < 0.0001$) comparing to EBRT75+. Higher pre-treatment IPSS worsened all GU toxicity outcomes (acute and late; grade ⩾2 and ⩾3; $p < 0.0002$) for PB group. Age group was not a significant predictor for any toxicity when other factors were controlled for.
Conclusions: Toxicity does not appear to be significantly affected by older age, both in EBRT and PB. Late grade 3 GI toxicity is slightly more common in PB75+, comparing to PB75−, although there was only 1 patient affected. Pre-treatment factors do not appear to be different between age ⩾75 vs <75 groups and selection bias is not apparent. Older patients(⩾75yr) have the same side effect profile as younger ones.

817 POSTER

Prostate Cancer: up-staging effect of MRI on conformal radiotherapy planning volumes

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Purpose: To analyze the impact of MRI on CT defined prostate volumes for conformal radiotherapy (CFRT) due to unsuspected detection of extracapsular extension (ECE), seminal vesicle and adjacent organ involvement.
Methods: 104 men with localized prostate cancer who had co-registered CT and MRI simulation images between 2−2002 and 2−2005 were identified. All post-prostatectomy recurrences were excluded. A radiologist reviewed both MRI simulation images and diagnostic MRI.
Prognostic grouping was categorized into low risk (PSA < 10, Gleason < 7, T1, 2a stage), intermediate risk (defined as having ⩾ 1 elevated parameter of PSA 10−20, Gleeson 7, T2b, 2c) and high risk prostate cancer (defined as ⩾ 1 elevated parameter of PSA >20, Gleeson 8−10, T3, 4) with 7, 26 and 71 cases for each group respectively. The majority of the intermediate and high risk patients i.e. 89 patients received 2−3 months of hormonal therapy before simulation and MRI.
Target volumes were initially delineated on CT without prior knowledge of MRI. The treatment volumes were then edited according to the co-registered MRI. Radiotherapy volumes were corrected if there was extracapsular invasion, seminal vesicle involvement or there was invasion of other organs i.e. bladder or bowel on MRI but not suspected clinically or detected on CT.
Results: Mean patient age was 68 years (range 47−78). The mean initial PSA was 25.50 ng/ml (3.6−194). The median Gleeson combined score was 7. The clinical prostate stage prior to MRI was of T1−2a disease in 42 patients, T2b-c in 26 and T3−4 disease in 36.
MRI evidence of ECE was found in 16 cases (15%) of which unsuspected in 8 cases and required treatment volume changes to incorporate the disease. Seminal vesicle invasion was detected by the MRI in 18 patients (17%) and in 16 it was clinically not suspected. The MRI defined segment of seminal vesicle involvement was then included in the high dose radiation prostate volume. Bladder and bowel involvement, mainly focal, was found in 17 (16%) and 7 (7%) patients respectively. This bladder and bowel invasion was not evident prior to MRI in 14 and 7 of the cases respectively. The MRI involved rectal or bladder wall segment was subsequently incorporated into the prostate volume but the dose to this region was limited by dose volume constraints. Overall there were 44 instances of unsuspected MRI defined pathology that resulted in changes to the initial CT determined target volumes in 31 (29%) cases.
Conclusions: Diagnostic and planning MRI has resulted in substantial target volumes changes for the radical irradiation of prostate cancer. MR imaging has reduced potential geographic miss and under-dosing of prostate target volume. The impact of this on clinical outcomes requires longer term follow-up.

818 POSTER

Influence of neoadjuvant hormonal therapy on health-related quality-of-life after brachytherapy and external beam radiotherapy for localized prostate cancer

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Background: The aim of the study was to characterize the influence of neoadjuvant hormonal (NHT) therapy on health-related quality-of-life (HRQOL) following different radiotherapy (RT) techniques for localized prostate cancer.
Material and methods: A cross-sectional survey using the expanded prostate cancer index composite HRQOL instrument was administered to 196 consecutive patients following different RT modalities: external beam RT (80 patients), Ir-192 temporary brachtherapy (BT) as a boost to external beam RT (44 patients) and I-125 permanent BT (72 patients). To avoid bias due to a RT technique, patients with and without NHT therapy were matched according to the RT modality, so that 50% received NHT in each RT technique group. A control group consisted of 196 prostate cancer patients before the start of RT (65 with and 131 without NHT).
Results: Median post treatment time was 26 (range 3−50) months, median age was 72 (range 51−84) years (no statistical difference with or without NHT). NHT independently (of age, post treatment time, RT method, presence vs. absence of prognostic risk factors) diminished urinary, sexual and hormonal HRQOL compared to patients after RT only. Significantly lower scores in all domains compared to the control group without NHT were found after RT with NHT (see table). Other independent factors were Ir-192 BT for decreased urinary function, patient age for urinary incontinence scores and sexual function, and external beam RT for decreased hormonal function.

	RT with NHT (n = 98)	RT only (n = 98)	control without NHT (n = 131)
urinary function	85±20	91±15	92±14
moderate/big problem from urinary dysfunction	28%	12%	14%
bowel function	87±15	89±12	93±8
moderate/big problem from bowel dysfunction	16%	10%	5%
sexual function	19±21	31±24	39±25
hormonal function	80±25	92±16	90±15
poor or no ability to have an erection	60%	35%	24%
moderate/big problem from sexual dysfunction	50%	38%	29%

Conclusions: Addition of NHT to BT or external RT led to significantly diminished HRQOL. General metabolism (e.g. lack of energy) as well as the repair process during/after RT seem to be affected. NHT should be avoided for patients without the evidence for a prognostic benefit.

819 POSTER

High dose rate brachytherapy combined with external beam radiation therapy for the treatment of prostate cancer

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Background: Low Dose Rate (LDR) brachytherapy combined with external beam radiation therapy (EBRT) has been used for quite some time for the treatment of cancer of the prostate. However, LDR brachytherapy is associated with considerable genitourinary side effects. We have incorporated HDR brachytherapy using Ir-192 into the treatment regimen to avoid these side effects.
Methods: Since January 2001, 185 patients with early prostate cancer stage T1, 2NO were treated with a protocol of combined external beam radiation and HDR brachytherapy. External beam radiation was delivered using 3D conformal radiation therapy or Intensity Modulated Radiation