either on a dedicated website or by mail. Descriptive statistics was used to summarize the data and describe responses.
Results: A total of respectively 458 and 158 questionnaires were collected from urologists and oncologists. A weekly multidisciplinary meeting is hold respectively by 33 and 46% of urologists and oncologists. Less than 3% of physicians meet less than once a month. CRPC is defined by the use of both PSA dosage and level of testosterone by respectively 66% and 78% of urologists and oncologists. In CRPC patients: bone scan plus CT scan is prescribed by 78% of oncologist and 48% of urologists; respectively 43% and 41% of urologists and oncologists primarily proposes hormonal manipulation and 12% and 21% an enrollment in a clinical trial. Only 24% of urologists and 48% of oncologists consider that the presence of metastasis is necessary to prescribe chemotherapy. Most of the oncologists would like to see the patient earlier on in the disease history, and 33% think that they see the patient too late. Among urologists, 72% believe to deliver correct information on chemotherapy to the patient, whereas 61% of oncologists consider that patients are not clearly informed about chemotherapy when referred from urology.
Conclusion: To our knowledge, this is the 1st study assessing cooperation between physician involved CRPC management. Multidisciplinary meeting is an effective tool to collaborate and to promote common treatment guidelines. Some work should be done to improve the communication to the patient and to smooth the patient referral from the urologist to the oncologist.

7022 POSTER

Intraoperative Rectal D2cc Monitoring Reduces Rectal Doses More Than Using V100 Alone in Real Time Dynamic LDR Prostate Brachytherpy

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Background: The 2007 ESTRO/EAU/EORTC guidelines in prostate brachytherapy recommend using the rectal D2cc (RD2cc) as the primary parameter for this organ at risk rather than rectal V100 (RV100). The real time technique allows intraoperative calculation of rectal D2cc and V100. This study examines the effect of switching from RV100 as the primary parameter to RD2cc with dynamic real time adjustments to optimise dose. Low RV100 volumes are easily achievable pre-implant and are always higher on post-implant dosimetry (PID).
Methods: Rectal dosimetry of 261 patients undergoing brachytherapy at the Royal Berkshire Hospital was examined. The initial 150 patients underwent the proceedure with intraoperative calculation of Prostate D90, Prostate V150, Rectal V100 and Urethral D10. Rectal D2cc was calculated retrospectively in this group. After the introduction of the 2007 recommendations, Rectal D2cc replaced Rectal V100 as the primary parameter. Both were calculated prospectively in a further 142 patients. Post-implant dosimetry was performed for all patients on CT scans at day 30.
Results: The recommendations state that RD2cc should be less than the prescription dose, which is 160 Gy in the real time technique at this centre.

	Number	Median Rectal Post-implant D2cc (Gy) (% of 160 Gy)	% implants with RD2cc at <160 Gy	Median Intropeative Rectal V100 cc	Median Post-implant Rectal V100 cc	Median Post-implant Prostate D90 Gy
Using rectal V100 as primary parameter	150	127.7 (79.8%)	88.0%	0.17	1.04	171.8
Using rectal D2cc as primary parameter	142	87.7 (54.8%)	97.7%	0.01	0.42	174.6
Significance level of differenc in medians (t-test)		<0.001		<0.001	<0.0001	0.055

These data show that significant reductions in rectal D2cc and V100 can be achieved by modifying intropeative dosimetry alerts. Adding in calculation of rectal D2cc and prostate V100 has allowed a 40 Gy reduction in median post-implant rectal D2cc and a decrease in rectal V100 by 59.6%. These reductions can be safely achieved without compromise to the prostate D90.
Conclusions: The use of RD2cc intraoperatively allows a significant reduction in rectal dose, over and above that achievable when using RV100 as the primary rectal parameter. Using RV100 as the primary parameter may give a false sense of security that the rectal volume irradiated is as low as is reasonably achievable.

7023 POSTER

On Board Imaging Shifts in Prostate Cancer Patients Treated Using External Beam Radiation Therapy

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Background: External beam radiotherapy (EBRT) in prostate cancer using intensity modulated techniques requires daily on-board image (OBI) guidance to correct eventual shifts in three dimensions. There are few data on what factors influence on the shifts values. Finding predictors of prostate's higher mobility would help in treating such patients.
The aim of the study was to assess the differences in shifts in cranio-caudal, lateral and antero-posterior dimensions in daily image-guided radiotherapy with intention-to-treat in prostate cancer patients and to determine if several planned organ volumes may impact the extent of the shift.
Materials and Methods: 51 patients were treated using EBRT with cone-beam computed tomography (CBCT) imaging due to prostate cancer from November 2010 to March 2011. The data were obtained from 39 patients planned to treat possibly on full bladder and empty rectum. The volume of bladder, rectum and clinical target volume (CTV) was measured for planning. Daily OBI was performed using CBCT and shifts in 3 dimensions were registered, the mean and maximum shifts on each dimension from each patient were calculated.
Results: The median of mean shifts was 0.33 cm on cranio-caudal dimension, 0,275 cm on lateral and 0.26 on antero-posterior. No maximum shifts greater than 2.4 cm were observed in the study group. No statistically significant correlations between CTV nor bladder and rectum volume on planning were noted (p- values for Spearman rank order correlations for maximum and mean lateral shifts greater than 0.22, >0.2 cm for cranio-caudal and >0.08 for antero-posterior). Higher incidences of maximum corrections were done on craniocaudal dimension (mean 0.88 cm 95%Confidence interval 0.66–1.11) in contrast with lateral dimension (mean 0.54 cm 95% CI 0.43–0.66) ($p = 0.01$). Antero-posterior shifts (mean 0.70 95% CI 0.54–0.86) did not differ from the cranio-caudal or lateral directions ($p = 0.36$ and 0.23 respectively).
Conclusions: The shifts on each 3 dimensions using CBCT are usually lower than 0.3 cm. There is no possibility to predict using the CTV, bladder or rectum volume on planning whether the patient would require greater corrective shifts in any dimension. Shifts in cranio-caudal dimension seem to require corrections more often than those in other dimensions.

7024 POSTER

Dose Escalated Radiotherapy for Prostate Cancer With Proton Boost

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Background: With the attractive physical features of proton beams and due to the increasing evidence for an advantage of hypofractionated treatment in prostate cancer (PC), a treatment schedule with a hypofractionated proton boost (PBT) combined with conformal external beam radiotherapy (EBRT) was introduced 2002 in our institution as an alternative to dose escalation with high dose-rate brachytherapy (HDR-BT). The outcome of 267 patients treated between 2002–2008 with regards to biochemical failure, overall survival and late side effects is evaluated.
Material and Methods: A cohort study of 64 low-risk, 98 intermediate, and 105 high-risk PC patients treated at the Department of Oncology, Uppsala Sweden. The schedule was 20 Gy in 4 fractions with PBT followed by 50 Gy in 2 Gy fractions delivered by EBRT. Assuming a value of α/β of 3 Gy and RBE of 1.1 the equivalent dose in 2 Gy fractions for the schedule is 87 Gy. A transperineal boost to the prostate with protons was administrated at the Svedberg Laboratory in Uppsala with a single, fixed, horizontal beam with 180 MeV energy. All EBRT were delivered with photon beams at energies $\geqslant$ 6 MV. For accurate positioning four gold markers were placed in the prostate. Of the high-risk patients 74%, whereas of the intermediate group 46% received hormonal deprivation during a median time of 7 and 5 months respectively. Median follow-up time is 48 months.
Results: Median age was 65 y (46−79 y) and median PSA 10 ng/ml (1.7–158 ng/ml) for the whole group. The median volume of the prostate measured by TRUS was 37cc (15–120 cc). No grade III or IV rectal toxicities were observed according to EORTC scoring criteria. Genitourinary problems at baseline of grade II and III were observed in 14% and 8% of patients respectively. Late toxicity is under evaluation. Totally 25/267 (9.4%) of the patients had biochemical relapse: none of the low-risk, 5/98 (5%) intermediate and 20/105 (19%) of high-risk patients. Only 3 patients (all high-risk) have died in PC and 243 (91%) of the patients are still alive.

Conclusions: Dose escalated radiotherapy with hypofractionated proton boost seems to be feasible for local control of prostate cancer without any serious acute or late rectal toxicity. A prospective trial between boost with HDR and protons is planned at our institution.

7025 POSTER

Long Term Outcome After Combined External Beam Radiotherapy and High Dose Rate Brachytherapy for Localized Prostate Cancer

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Background: The aim of the study was to retrospectively analyze long-term results for treatment of localized prostate cancer using combined high-dose-rate brachytherapy (HDR-BT) and external beam radiotherapy (EBRT).
Material and Methods: From November 1994 to February 2000, 51 patients with locally confined prostate cancer (stage T1b-T3b) were treated with EBRT (50 Gy in 25 fractions) and HDR-BT (16 Gy in 2 fractions). Long-term outcome was analyzed as overall survival (OS), disease-specific survival (DSS) and biochemical control (BC). Biochemical relapse was computed using the 2006 Phoenix RTOG/ASTRO definition (PSA at follow-up $\geqslant$ 2 μg/l above nadir). Time estimates were obtained using the Kaplan–Meier method. Late GU/GI toxicity was graded according to the Common Terminology Criteria, version 3.0. A cross sectional self-report survey of quality of life was performed among surviving patients using the EORTC QLQ-C30, Version 3.0 questionnaire and the prostate specific module QLQ-PR25.
Results: After a median follow up of 10.1 years, 28 (55%) patients were alive. Biochemical failure was detected in 7 patients (13.7%). The 10-year cumulative probabilities of overall survival (OS), disease specific survival (DSS) and biochemical control (BC) were 58%, 93% and 77% respectively. Late rectal toxicity and urinary tract toxicity were minimal. There were 3 patients with GU toxicity $\geqslant$3. This was reflected in the self-reported quality of life scores for urinary and bowel function where the majority patients scored their urinary and bowel function as normal. Scores for the global quality of life and physical functioning showed values that were comparable to that of the general population >70 years.
Conclusions: This retrospective analysis showed excellent local control rates of combined treatment with external-beam radiation therapy and conformal high-dose-rate brachytherapy boost. Late GU and GI toxicity was low.

7026 POSTER

Hypofractionation and Conventional Fractionation Radiotherapy Schedules in the Treatment of Localized Prostate Cancer

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Background: Hypofractionated (HF) radiation for prostate cancer presents an opportunity to exploit potential biological and practical advantages based on a putatively low α/β ratio. We review a single institution experience of HF and conventional (CF) radiation schedules in localized prostate cancer.
Methods and Materials: From 2001–2004, 87 HF patients were treated with image-guided IMRT to 60 Gy in 20 fractions on a phase II study. During this time period, 263 CF patients were treated with 79.8 Gy in 42 fractions delivered via image-guided 3DCRT (87.1%) or image-guided IMRT (12.9%). Patients receiving adjuvant hormone therapy were excluded. The primary end-point was 5-year clinical progression free rate (cPFR) defined as post-radiation PSA nadir + 2 ng/mL, salvage therapy or positive prostate biopsy. HF non-inferiority was tested with a hazard ratio of 1.32 as the upper limit of equivalence for cPFR. Secondary endpoints were physician scored RTOG acute/late genitourinary (GU) and gastrointestinal (GI) toxicity.
Results: The HF and CF groups were similar for median age, median initial PSA, Gleason score and T-category. There were more low-risk patients in the HF group (HF 31.0% vs CF 22.8%; $p = 0.03$). cPFR and late toxicity rates are presented in the table. The difference in cPFR for HF and CF was not significant after univariate (UVA) and multivariate analyses (MVA). Significant predictors of cPFR on UVA were risk category, T-stage, initial PSA and Gleason score. Age was not a significant predictor on UVA analysis. After MVA, T-category (HR = 1.81, 95% CI 1.11–2.95; $p = 0.02$), initial PSA (HR 1.09, 95% CI 1.03–1.15; $p = 0.003$) and Gleason score (HR 2.79, 95% CI 1.65–4.70; $p < 0.01$) remained significant after MVA. Only a lower risk of late GI toxicity was associated with HF (HR = 0.41, 95% CI 0.00–0.98; $p = 0.02$), but this significance was lost on MVA when treatment method (3DCRT vs IMRT) was considered.
Conclusion: The cPFR and late toxicities of HF and CF are similar and are consistent with other reports of CF for localized prostate cancer. The sample size was likely too small to detect non-inferiority, but the possibility of HF inferiority to CF remains. The use of IMRT for HF radiotherapy may be important to maintain acceptable late toxicity rates. These results support further investigation of HF in ongoing randomized controlled studies.

	HF	CF
5 year cPFR	72%	77%
5-year late GI score		
$\geqslant$2	5%	12%
$\geqslant$3	1%	1%
5-year late GU score		
$\geqslant$2	11%	13%
$\geqslant$3	0%	2%

7027 POSTER

Postoperative External Beam Radiotherapy in Prostate Cancer − Results of the Spanish Registry of Prostate Cancer

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Background: To describe the results of treatment with EBRT in patients previously treated with radical prostatectomy.
Patients and Methods: For this study we have carried out the retrospective analysis of the data included in the electronic database of the different national researchers are part of the RECAP (Spanish Registry for Prostate Cancer). We selected for this patient who met the inclusion criteria of radical prostatectomy with or without lymphadenectomy and postoperative treatment with RTE.
Results: Patients who met the inclusion criteria have been 919 patients. The mean age was 65 years (range: 42−80 years). The type of surgery was exclusively prostatectomy in 41% of cases with lymphadenectomy in 59%. The pathological stage was pT2 in 80%, pT3 in 14% and pT4 in 1% and 5% unknown. 31% of patients increased the value of the Gleason score in surgical specimen of the value of the biopsy Gleason. The RT was administered adjuvant for pT3 and/or positive margins (3−6 months after surgery) in the 29.86% of the patients, biological relapse in 61.73% and histological relapse in 8.41%. The median pre-RT PSA was 0.73 ng/ml (0−29). The mean dose prescribed to the prostate bed was 70 Gy (54–80.8 Gy) compared with 66.6 Gy in the adjuvant RT group and 70 Gy in biological relapse. No G3−4 toxicity at any level were founded. The 66% of patients presented G0 toxicity in all areas (GU, GI, sexual). The median follow-up was 34 months (3–141 months). The biochemical failure-free survival (bDFS) at 2 and 5 years was 94% and 81% respectively. In the adjuvant RT group was 94% and 81% and biological failure group 92% and 76% ($p = 0.05$). The SG has been 99% and 96% at 2 and 5 years. The factors significantly associated with DFS and bDFS have been the value of PSA <1 ng/ml ($p < 0.0059$) and total RT dose >70 Gy ($p < 0.0737$).
Conclusions: This is the first national retrospective study of post-operative RT in prostate cancer. We conclude that administration of EBRT in patients treated with radical prostatectomy has an excellent toxicity profile and a high rate of biochemical control. The level of PSA <1 ng/ml and doses of RT greater than 70 Gy significantly influenced a better biochemical control.

7028 POSTER

Ano-Rectal Function in Patients With Prostate Cancer Following Radiotherapy or Radical Prostatectomy

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Background: Patients receiving radiotherapy (RT) for prostate cancer (PC) may suffer from bowel dysfunction including urgency, incontinence and increased frequency of defecation due to irradiation of the rectum. In this