OC-0365
Salvage high dose rate brachytherapy in radio-recurrent prostate cancer: analysis of 106 patients.
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Purpose/Objective: The aim of this analysis is to present our experience with TRUS-based HDR brachytherapy as a salvage local treatment for radio-recurrent prostate cancer. We investigated treatment results and toxicity profile of this reirradiation protocol. Analysis of clinical and dosimetric parameters was performed to define prognostic factors in this group of patients and optimize treatment. According to our knowledge this is the largest group of patients treated with HDR salvage prostate brachytherapy presented in literature.

Materials and Methods: From August 2001 to November 2008 106 consecutive patients with recurrent prostate cancer after primary irradiation were treated at Department of Brachytherapy in Warsaw, Poland. The treatment consisted of HDR interstitial brachytherapy based on TRUS images (30Gy in 3 fractions of 10Gy to whole prostate) and 12 months of hormonal treatment. The effectiveness of treatment was evaluated with Kaplan-Meier estimates for 3- and 5-year overall survival (OS) and biochemical progression free survival (bPFS). Biochemical recurrence after salvage treatment was defined according to ASTRO and Phoenix criteria. The RTOG and CTCAE v. 3.0 scales were used to grade acute toxicity. Late toxicity was scored with RTOG/EORTC scale. We analyzed clinical parameters (Gleason score, PSA level, T tumor status), PSA kinetics parameters (PSA doubling time, PSA velocity, time to PSA failure) in order to define the most suitable group of patients to benefit from this treatment.

Results: For the purpose of abstract submission we present crude data only. With median follow-up of 64 months (range, 20-135) 16 patients (15%) died, including 11 (10%) who died of prostate cancer. 43 patients (48%) are alive with no sign of subsequent biochemical progression according to Phoenix criteria. In 15 patients consecutive local recurrence was diagnosed. Disease systemic progression was observed in 28 patients. The toxicity of treatment is acceptable with grade 3 toxicity in only 5 patients (4.7%). 3 patients (3.2%) died of acute toxicity. No severe (G3-G4) GI toxicity was reported. Urinary toxicity was mild (grade 1) in 84 patients and grade 2 in 24 patients. With median follow-up of 64 months (range, 20-135) 16 patients (15%) died, including 11 (10%) who died of prostate cancer. 43 patients (48%) are alive with no sign of subsequent biochemical progression according to Phoenix criteria. In 15 patients consecutive local recurrence was diagnosed. Disease systemic progression was observed in 28 patients. The toxicity of treatment is acceptable with grade 3 toxicity in only 5 patients (4.7%). 3 patients (3.2%) died of acute toxicity. No severe (G3-G4) GI toxicity was reported. Urinary toxicity was mild (grade 1) in 84 patients and grade 2 in 24 patients. 43 patients (48%) are alive with no sign of subsequent biochemical progression according to Phoenix criteria. In 15 patients consecutive local recurrence was diagnosed. Disease systemic progression was observed in 28 patients. The toxicity of treatment is acceptable with grade 3 toxicity in only 5 patients (4.7%). 3 patients (3.2%) died of acute toxicity. No severe (G3-G4) GI toxicity was reported. Urinary toxicity was mild (grade 1) in 84 patients and grade 2 in 24 patients.

Conclusions: HDR interstitial brachytherapy is effective and safe method of treatment in radio-recurrent prostate cancer. At the cost of mild to moderate toxicity it gives 50% chance for long-term survival without biochemical disease progression. Patients with negative prognostic factors (T3 disease, short PSA DT and Gleason score 8-10) are not ideal candidates for this treatment.

OC-0366
Establishing margins for focal brachytherapy in prostate cancer
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Purpose/Objective: Focal transperineal interstitial permanent prostate brachytherapy (BT) aims to reduce the treatment target volume to only the primary tumour focus in patients with localized prostate cancer. This reduces the required number of seeds and needles, lowering the toxicity of the treatment. We investigated the geometrical accuracy of implanting a focal treatment plan by comparing the planned dose with the delivered dose based on post-treatment CT dosimetry.

Materials and Methods: Ten patients with localized prostate cancer were treated using 125I BT Seeds. Multi-parametric MRI was used to delineate the GTV and the GTV expanded by a 5 mm margin to account for seed placement variations (GTV+). In the pseudo-focal approach, two plans were designed: (1) A focal plan aiming to cover only the GTV+ and (2) a plan with those seeds required to cover the rest of the prostate. The whole prostate was then treated by applying both plans. The dose distribution (DD) was reconstructed from seed locations from the focal plan using CT images acquired 4 weeks post-treatment. The CT images were rigidly registered to T2w MR images acquired the same day. These T2w images were also registered to the pre-treatment MR images (with the GTV delineation) using a non-rigid registration to allow for residual prostate swelling and other prostate deformations (see overview in figure below).

The 144 Gy isodose contours (IC) of the planned and delivered DDs were compared by measuring the shortest distance from all points on one contour to the surface of the other. These distances are negative when the planned ICs are smaller than the delivered ICs, and positive when the planned ICs are larger. Histograms of the distances between the planned and delivered doses are used to determine the margin of error for covering the delineated region with the 144 Gy IC. The D90 and V100 for the GTV- and GTV+ of the planned and realized DD were determined.

Results: The GTV+ for the 10 patients enclosed a volume of 5.7 [2.7 - 13.3] cc (median [min - max]), and the number of BT seeds for the focal plan was 18.5 [12 - 27] seeds. The volume for the entire prostate was 39.8 [22.5 - 63.3] ml and it received 68 [44 - 81] seeds.

Conclusions: For the purpose of abstract submission we present crude data only. With median follow-up of 64 months (range, 20-135) 16 patients (15%) died, including 11 (10%) who died of prostate cancer. 43 patients (48%) are alive with no sign of subsequent biochemical progression according to Phoenix criteria. In 15 patients consecutive local recurrence was diagnosed. Disease systemic progression was observed in 28 patients. The toxicity of treatment is acceptable with grade 3 toxicity in only 5 patients (4.7%). 3 patients (3.2%) died of acute toxicity. No severe (G3-G4) GI toxicity was reported. Urinary toxicity was mild (grade 1) in 84 patients and grade 2 in 24 patients. With median follow-up of 64 months (range, 20-135) 16 patients (15%) died, including 11 (10%) who died of prostate cancer. 43 patients (48%) are alive with no sign of subsequent biochemical progression according to Phoenix criteria. In 15 patients consecutive local recurrence was diagnosed. Disease systemic progression was observed in 28 patients. The toxicity of treatment is acceptable with grade 3 toxicity in only 5 patients (4.7%). 3 patients (3.2%) died of acute toxicity. No severe (G3-G4) GI toxicity was reported. Urinary toxicity was mild (grade 1) in 84 patients and grade 2 in 24 patients. 43 patients (48%) are alive with no sign of subsequent biochemical progression according to Phoenix criteria. In 15 patients consecutive local recurrence was diagnosed. Disease systemic progression was observed in 28 patients. The toxicity of treatment is acceptable with grade 3 toxicity in only 5 patients (4.7%). 3 patients (3.2%) died of acute toxicity. No severe (G3-G4) GI toxicity was reported. Urinary toxicity was mild (grade 1) in 84 patients and grade 2 in 24 patients.

Conclusions: HDR interstitial brachytherapy is effective and safe method of treatment in radio-recurrent prostate cancer. At the cost of mild to moderate toxicity it gives 50% chance for long-term survival without biochemical disease progression. Patients with negative prognostic factors (T3 disease, short PSA DT and Gleason score 8-10) are not ideal candidates for this treatment.

OC-0367
New evidence-based benchmarks for radiotherapy service provision
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Purpose/Objective: In 2003 we examined every indication for radiotherapy and how common each indication was. Overall 52% of new cases of cancer had an indication for radiotherapy. The benchmark was adopted by Australian and UK governments, and by the ESTRO QUARTS group. The aim of this study was to develop current evidence-based benchmarks for planning radiotherapy service provision.

Materials and Methods: We reviewed national and international guidelines for radiotherapy indications in the management of cancers notifiable to cancer registries. Benign tumours and non-melanomatous skin cancers were excluded because of the lack of population-based data. An indication was defined as a clinical situation where new cases of cancer had an indication for radiotherapy. The benchmark was adopted by Australian and UK governments, and by the ESTRO QUARTS group. The aim of this study was to develop current evidence-based benchmarks for planning radiotherapy service provision.

Conclusions: We have shown for this small heterogeneous group of patients, that a margin of 0.58 cm is sufficient to achieve adequate dose coverage of the planned GTV.

POSTER DISCUSSION: 10: CLINICAL: HEALTH ECONOMICS IN RADIATION ONCOLOGY (HERO)