with short course hypofractionated radiotherapy (RT) were included in this study. Pre-operative treatment with RT was followed by a total mesorectal excision (TME) within 3 days after the last RT fraction. For each patient, a FDG-PET-CT scan was performed prior to the start of treatment. The tumor was automatically delineated from the PET-images using SUV-thresholding, with the threshold depending on the tumor-to-background signal ratio. The volume of the PET-based tumor contour was validated by pathological examination of the resected specimen. For this validation, the resected specimen was sliced into 5 mm slices and each slice was photographed. On the photographs, the tumor was manually delineated by the pathologist. The tumor volume was calculated by multiplying the tumors surface area with the slice thickness of 5 mm. Automatic delineation with other methods, including watershed based clustering, will be presented.
Results: Automatic SUV-threshold based tumor delineation resulted in an average tumor volume of 16.2±11.3 cm^3 (range: 7.7 to 38.7 cm^3), whereas pathological examination of the resected specimens resulted in an average tumor volume of 16.0±11.5 cm^3 (range: 7.8 to 36.5 cm^3). The average volume difference was 2±2.0 cm^3 (range: -2.2 to 3.0 cm^3). A correlation coefficient of 0.964 ($p<0.001$) was found when correlating the tumor volumes resulting from PET-analysis and pathological examination.
Conclusions: The strong correlation between the tumor volumes resulting from SUV-thresholding of PET-images and pathological examination of the surgical specimen demonstrates the accuracy of automatic PET-based tumor delineation based on SUV-thresholding for patients diagnosed with rectal cancer. This unique 3D dataset will be used as golden standard for the comparison of multiple PET-based automatic segmentation algorithms.

PD-0458
AFP response as a predictor of clinical outcome after stereotactic body radiotherapy (SBRT) for advanced HCC
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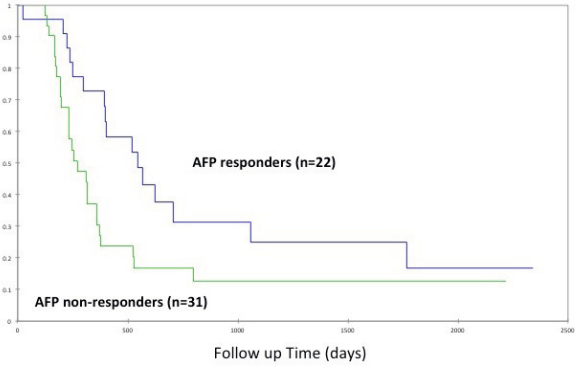
Purpose/Objective: The clinical utility of alpha-fetoprotein (AFP) as a predictor of treatment outcome in patients with advanced HCC receiving stereotactic body radiotherapy (SBRT) has been poorly defined. We aimed to study the clinical value of AFP response in an attempt to validate it as a surrogate serologic end point.
Materials and Methods: We analyzed the prospectively collected data of 53 locally advanced HCC patients with elevation of AFP (>20) received individualized hypofractionated radiotherapy using stereotactic body radiotherapy (SBRT) technique between 2006 and 2011. AFP response defined as >50% decrease from baseline, 3 months after the completion of SBRT. Radiological response rate was assessed by CT scan using RECIST criteria.
Results: Median follow-up time was 11.2 months. Patients' characteristics were as follows: Median age (62 years, range: 36-86); Male/ female (n= 44/9 respectively); Child-Pugh class A/B (n= 45/8 respectively); and portal vein thrombosis (n=23). Individualized hypofractionated radiotherapy using SBRT technique was given at 4Gy per fraction, range from 5-10 fractions, with the median dose of 32Gy was delivered. The overall response rate was 39.6%. The median overall survival (OS) and progression free survival (PFS) was 11.2 months and 5.4 months respectively. AFP responders (n= 22) had better objective response rate than AFP non-responders (n=31) after SBRT (59.1 vs. 25.8%; P=0.01). Median OS rate was longer in AFP responders (17.9 vs 9.0 months, p=0.02). Median PFS rate was also longer in AFP responder than AFP non-responders although it was not statistically significant. (PFS, 7.0 vs 5.1 months, p= 0.18). In multivariate analysis, AFP response was independent factor affecting OS (hazard ratio, 2.46; 95% CI, 1.07 to 5.68; p=0.035). Of the 29 patients with radiological stable disease (SD), AFP responders (n=9) had a better 1-year survival rate than AFP non-responders (n=20) (66.7% vs 31.9%, p=0.049).
Figure 1. Overall survival (OS) of AFP responders and AFP non-responders

Figure 1. Overall survival (OS) of AFP responders and AFP non-responders



Conclusions: AFP response is useful in predicting prognosis and treatment response in patients with advanced HCC received SBRT. Incorporation of AFP response into the criteria of evaluating the outcome of SBRT should be considered. Additional treatment may require in the AFP non-responders.

POSTER DISCUSSION: YOUNG SCIENTISTS 3: GENITOURITARY (PROSTATE INCLUDED)

PD-0459
Whole-pelvis RT improves bRFS of node-negative patients treated with post-prostatectomy high-dose salvage RT.
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Purpose/Objective: To investigate the possible benefit deriving from whole pelvis radiotherapy (WPRT) in combination with high-dose salvage radiotherapy (HDSRT) in the salvage treatment of node-negative patients experiencing a biochemical recurrence (BR) after radical prostatectomy (RP) and pelvic lymphoadenectomy.
Materials and Methods: From 1998 to 2008, 208 node-negative (median 11 LN) patients (pts) underwent HDSRT at 1.8 Gy/fraction to the prostatic bed (PB) only (n=138, median dose 73.8 Gy) or to WPRT (n=70, median dose 50.4 Gy) followed by a boost to PB (median dose 75.6 Gy). All pts underwent 3DCRT technique except for 28 who received WPRT-IMRT followed by a 3DCRT boost to PB.
Patients characteristics were comparable in terms of preoperative PSA, pT, surgical margins, Gleason score (GS), median time to BR after RP (overall 21.5 months), median PSA doubling time (PSADT, overall 8.9 months), PSA at SRT (PSA@SRT, overall 0.70 ng/mL) and fraction of pts receiving neoadjuvant (NAD) or adjuvant androgen deprivation (AAD) in addition to SRT. The 2 groups differed significantly in terms of median follow-up (FU, 102 *vs* 73 months, owing to the gradual introduction of WPRT over time), fraction of biopsy confirmed local relapse (49% vs 31%), length of AAD (10 vs 15 months) and median RT dose (73.8 *vs* 75.6 Gy) in PB vs WPRT+PB group, respectively.
Results: After a median FU of 87 months, WPRT+PB resulted in a significant improvement of 7-year biochemical relapse-free survival (bRFS) when compared to PB only both in the overall population (86 *vs* 67%, p=0.02) and in the subset of the 134 pts with a PSA@SRT ≤1 ng/mL (90 vs 69%, p=0.02). The other factor predictive of improved bRFS at univariate analysis (UA) in both subgroups was RT dose (p-value always <0.0001, most informative cut-off <73.8 Gy in both cohorts). Radiation doses ≥75.6 Gy resulted in improved 7-year bRFS both in the overall population (87% *vs* 63%, p<0.0001) and in pts with PSA@SRT ≤1 ng/mL (85% vs 65%, p=0.002). In the overall population, pT and PSADT (but not NAD nor AAD) were also significant predictors of bRFS at UA. At multivariate analysis, in the overall population PSA@SRT, RT dose ≤73.8 Gy, PB only irradiation and GS 7-10 (and in the subset with PSA@SRT ≤1 ng/mL, PB only RT and and GS ≥8) independently predicted treatment failure. Overall, HDSRT resulted in only mild acute and late genitourinary (GU) and gastrointestinal (GI) toxicity (TOX), without significant differences between WPRT+PB or PB subgroups. Of note, WPRT resulted in a doubling of acute intestinal G2 TOX (15 vs 7%), a finding which disappeared when only pts treated