Purpose or Objective: Image-guided intensity modulated radiotherapy (IG-IMRT) reduces dose to organs at risk (OARs) compared to 3D-conformal radiotherapy (3D-CRT). Currently it is not known to what extent this reduces late toxicity in prostate cancer patients. We previously reported on significant reductions in dose to OARs and acute toxicity. The aim of this study was to assess the therapeutic gain with IG-IMRT in terms of long-term toxicity reductions, and to establish to what extent acute toxicity was associated with late side effects. For that purpose we used prospective data of two randomized trials.

Material and Methods: A total of 242 IG-IMRT patients from a hypofractionation trial (2007-2010) and 189 3D-CRT patients from a dose escalation trial (1997-2003) with ≥2 completed questionnaires were selected. All patients received 78 Gy in 2 Gy fractions. Applied margins were 10 mm for 3D-CRT and 5-8 mm for IG-IMRT, all with 0 mm margin towards the rectum for the 10 Gy boost. The mean dose to the anorectum was 34.4 Gy vs. 47.3 Gy, 23.6 Gy vs. 44.6 Gy for the anal canal and 33.1 Gy vs. 43.2 Gy for the bladder (all significantly reduced with IG-IMRT). Late toxicity was scored using identical questionnaires and case report forms according to RTG/EORTC scoring criteria. Study endpoints were grade ≥2 (G≥2) gastrointestinal (GI) and genitourinary (GU) toxicity. Cumulative incidences of G≥2 endpoints were calculated. Cox regression was used to determine Relative Risks (RR) for IG-IMRT, adjusted for baseline factors. RRs of acute toxicity as a predictor for late G2 endpoints were also calculated.

Results: Median follow-up was 60 months. The five-year (5y) cumulative incidence of late G2 GI toxicity was 25.4% for IG-IMRT compared to 36.4% for 3D-CRT (RR=0.66, p=0.009) (Figure 1). This resulted from significantly lower incidences of increased stool frequency ≥6/day (4.3% vs 16.5%, RR=0.24, p=0.001) and non-significant lower incidences a2 G (needing medical intervention) rectal bleeding (RR=0.67, p=0.4), rectal pain/cramps (RR=0.59, p=0.13), and proctitis (RR=0.38, p=0.05). G2 anal incontinence (with use of pads) was not reduced (RR=1.02, p=0.9). With regard to GU toxicity, a non-significant increase was observed with IG-IMRT with 5y incidences of 46.9% vs. 37.1% for 3D-CRT (RR=1.28, p=0.001). Acute ≥2 toxicity was predictive for late G2 toxicity (RR=2.9 for IG-IMRT, 2.5 for 3D-CRT, both p<0.01), especially for rectal discomfort (RR=7.2, p<0.001) in IG-IMRT, and rectal incontinence (RR=3.5, p<0.01) in both groups. IG-IMRT patients with acute GU G2 complaints had a 1.81 fold (p=0.002) increased risk of late GU G2 toxicity, compared to 2.37 (p=0.001) for 3D-CRT.

Conclusion: IG-IMRT for prostate cancer was beneficial since it significantly reduced the incidence of long-term GI toxicity, as a result of lower doses to OARs and reduced acute toxicity levels. GU toxicity was not reduced despite significant reductions in bladder dose.

PO-0743
Stereotactic body radiotherapy in recurrent lymph node metastases from prostate cancer
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Purpose or Objective: To assess outcome and toxicity of stereotactic body radiotherapy (SBRT) in prostate cancer patients (pts) with recurrent isolated lymph node metastases (LNM).

Material and Methods: Between September 2008 and December 2014, 40 prostate cancer pts with 47 recurrent isolated LNM, were treated with SBRT. Median age was 74 yrs (range, 58-83), median Gleason score at the primary diagnosis was 7 (range, 5-10). Median and mean time from primary treatment to SBRT were 37.45 and 62.6 m, respectively (range 11.16-216.03). Diagnosis was performed with choline (ch) PET/CT, and the mean and median PSA values before SBRT were 5.6 and 4.2 ng/ml, respectively. Six (15%) pts were treated in different sessions for metachronous metastases, and one (2%) underwent SBRT for two synchronous metastases. 21 (52.5%) pts underwent only SBRT, remaining 19 (47.5%) received also androgen deprivation therapy (ADT). Gross tumor volume (GTV) was delineated using choline uptake and planning target volume (PTV) was defined as the GTV plus a 5-8 mm isotropic margin. Mean and median volume of GTV and PTV were 6.63 cc and 3 cc and 25.03 and 15.03 cc, respectively. In 90% of cases 5 fractions of 6-8 Gy were delivered. Response was assessed with PSA evaluation scheduled every 3 m during the first year and then every 6 m. Pts with a reduction or a stability of PSA level were considered responders. Being evaluation of response with ch-PET-CT not mandatory, it was done in 23 (57.5%) pts.

Results: Mean and median follow-up were 30.18 and 23.8 m, respectively (range 3.73-79.8). Mean time of biochemical progression from the end of SBRT was 15.54 m (range 1.16 - 48.86), and the 2-years biochemical progression free survival (b-PFS) was 44%. We registered a complete concordance between PSA increase and progression of disease shown at ch-PET/CT. Sixteen (40%) of the pts experienced no disease recurrence after SBRT. Of 21 no-ADT pts, 16 (76%) were still free from ADT (mean 26.18 m), whereas remaining 5 (24%) had a mean deferment time of ADT of 13.58 m. At univariate analysis, Gleason score ≥7 is related with a worse b-PFS (p=0.02). Acute grade 2 diarrhea was registered in 1 (2.5%) case. Grade 3 small bowel late toxicity was observed in only one (2.5%) case within 11.76 m after the end of SBRT.

Conclusion: SBRT resulted effective and generally well tolerated by pts. PSA level is a valid tool for response evaluation and ch-PET/CT can be useful for pts with documented biochemical progression.

PO-0744
Effects of IMRT or radical prostatectomy (RP) on serum testosterone in patients with prostate cancer
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Purpose or Objective: Subtle changes in serum testosterone have been noted in prostate cancer patients, without androgen blockade, treated with radiotherapy as well as radical prostatectomy (RP). The significance of these changes
remains unanswered. The aim of the study was to retrospectively review the changes in total testosterone in low risk prostate cancer patients treated with IMRT alone, in comparison with a RP cohort and to assess the correlation between dosimetric parameters for the testes and changes in the level of testosterone.

**Material and Methods:** From 2009-2012 we studied 115 men in this cross-sectional study. 92 patients underwent RP and 23 patients were treated with IMRT exclusively. The patients were treated with IMRT to the prostate and seminal vesicles for a total dose of 76 Gy (2 Gy/d, 5d/w) with 6 MV photons. We measured serum levels of total testosterone, at baseline and at 3, 12 and 24 months after treatment. We calculated the mean and maximum dose in the testes and the distance between PTV-tests. T-test and Pearson correlation index (PI) were used for statistical purposes.

**Results:** Patients undergoing RP were younger with IMRT (64.3 vs 72 years, p<0.0001). No differences regarding serum hormonal levels were found at baseline between the two groups. At 3months the testosterone levels were significantly lower in IMRT group (360.3 vs 414,83 ng/dl) in comparison with RP group (p=-0.039). At 12 months testosterone levels remained significantly lower (339,89 vs 402,39 ng/dl, p=0,03) in the IMRT group.

In the IMRT group the mean and maximum testes doses (± SD) were 0.472Gy (±0.195) and 0.896 Gy (±0.382) respectively. At 3 months, the mean testosterone reduction was 29.4 ng/dl (± 111.3), without correlation among the mean and maximum dose to the testes (p=0.2). At 12 months, 60% (11/20) of the patients had recovered their basal testosterone levels as well as 61% (11/18) at 24 months. The PI didn’t show any statistical significance related with testosterone kinetics and dosimetric parameters at 12 and 24 months. In the multivariate analyses, we didn’t find any significant relationship regarding: scattered doses in testes; total dose to the prostate; distance between PTV-tests or age, with testosterone recovery.

**Conclusion:** Despite IMRT for localized prostate cancer leading to low doses to the testes, we observed a decline in total testosterone higher than RP. Nevertheless, it doesn’t seem to correlate with either dosimetric parameters or the scattered dose in testes. More studies are needed to elucidate the role that the prostate may play as an endocrine organ itself.

**PO-0745**

**Significant correlation between prostate volume and obstructive voiding symptom in hypofractionation**

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**Purpose or Objective:** To investigate the correlation between initial prostate volume and the probability of developing acute Obstructive Voiding Symptoms (OVS) during the course of moderate hypofractionated (HF) prostate RT.

**Material and Methods:** Data from patients (n=181) undergoing IMRT delivered, daily Cone Beam CT guided, HF RT were retrospectively analyzed. Two treatment schedules were considered: HF1 (2.6 Gy/fr, 27 fr; n=107) and HF2 (3.15 Gy/fr, 20 fr, 4 days a week; n=74). Patients verifying: 1. previous OVS score 3 or greater according the International Prostatic Symptoms Score (IPSS), 2. CTVs encompassing volume outside the prostatic capsule (i.e. margin for extracapsular extension or seminal vesicles invasion), 3. presence of central calcification masses or 4. altered RT schedules for reasons other than OVS, were excluded. Measured HF1 and HF2 median prostate volumes as contained in the simulation CT image were 61.0 cc [18.6, 157.7] and 53.6 cc [18.5, 114.8], respectively. OVS was assessed according the RTOG/CTC v3.0 scale. Development of OVS G2 or greater during treatment was considered as binary end-point. Volume-effect correlation was evaluated by logit analysis, assuming a log-normal distribution.

**Results:** OVS G2 or greater was found in HF1 (n=11) and HF2 (n=10) patients. A few patients HF1 (n=1) and HF2 (n=5) needed urethral catheterization. Some patients (n=12) had their course of treatment modified due to OVS: temporary interruption of treatment (n=6), modified fractionation (n=5), urinary catheterization at treatment delivery (n=1). Logistic analysis showed that prostate volume did not correlate with OVS for HF1 patients (p > 0.05) but proved to be significantly predictive of OVS for HF2 patients (p = 0.0002). For this second arm, normalized gradient of the volume-effect regression curve was found to be y50=7.8 [3.2-14.7] and ED50 = 95.7 cc [84.7-117.8] (see Figure). The Receiver Operating Characteristic analysis (ROC) showed excellent predictive capabilities of the model, with Area Under the Curve AUC=0.94. Based on these findings, a volume cutoff value of 80 cc, corresponding to an acceptable 20% risk of OVS G2 or greater was selected.

**PO-0746**

**Spanish validation of Charlson Index applied to prostate cancer**

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**Purpose or Objective:** Comorbidity assessment is essential to triage of care for men with prostate cancer. Specially in these with an expectative of life less of ten years. We made a Spanish validation of comorbid revised Charlson index (RCI) applied to prostate cancer.

**Material and Methods:** A group of 619 consecutive patients of Prostate Cancer diagnosed between 1994-2007 were send for clinical assessment at Radiation Oncology Department of Hospital Clinic of Barcelona. A long the period of follow-up (till November 2014) 69 patients deceased for Prostate Cancer and were excluded in this study in order to determine the risks of mortality associated with comorbidities measured by the RCI.