Conclusions: The Eclipse planning system is able to achieve a comparable plan quality for Elekta VMAT delivery technique to that of fixed field IMRT in terms of target coverage and critical structure sparing using optimizing templates without operator interference. Plans with 2 arcs show less exceeding of the objectives than plans with 1 arc. In the VMAT cases where the objectives are not met, adjusting the optimization parameters once results in an improvement of the target coverage and OAR sparing.

PO-0825
Rectal dose limiting efficacy assessment of an implantable biodegradable device for prostate cancer radiotherapy
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Purpose/Objective: Many indications suggest that a dose escalation in prostate carcinoma treatment could improve the disease local control. Several methods are developed to reduce the rectal volume involved in high doses since rectal toxicity is one of main aspects limiting the prescribed dose. One possible strategy is to insert between rectum and prostate walls a little balloon. This study aims to assess the efficacy of this experimental device in reducing rectal dose in prostate EBRT.

Materials and Methods: 9 patients with prostate carcinoma were recruited in 2010 at the Oncology Institute of Veneto (Padova, Italy) for a one-arm multicenter study to evaluate the use of a biodegradable implantable balloon in term of efficacy and safety. The balloon is made of co-polymer Polyl-lactide-co-e-caprolactone. After the implantation between prostate and rectum anterior wall the balloon is filled with physiological solution. It remains in situ at least the whole radiation treatment time. Every patient had a CT scan (CT1) before the implantation and one after (CT2). The last one was used for plan optimization. A mean of 4 CT scans were acquired for every patient during treatment to assess the stability of the device. 3 treatment plans were calculated on CT1 and CT2.

1. a 6 fields standard 3DCRT (the one actually delivered).
2. a 7 fields 3DCRT technique.
3. a 7 fields IMRT.

The prescribed dose was D95=78 Gy in 39 fractions, D50, V75, V70, V65, V60, V50 and V50 region DVH points were evaluated. QUANTEC dose limits were also verified. 3DCRT plans calculated on CT2 were compared with the IMRT plans calculated on CT1 to evaluate the device efficacy instead a highly conformance technique. A t-test was used to evaluate the statistic significance between plans.

Results: Dose analysis shows implant efficacy for both 6 and 7 fields 3DCRT techniques. DVHs comparison shows a 40 % and 55% mean reduction in V50 and V60 values. D50 decreases from 54,95 Gy to 44,26 Gy for the 6 fields 3DCRT with a reduction of 18% (p = 0.01) and from 49.6 Gy to 38.8 Gy for the 7 fields 3DCRT with a reduction of 21% (p = 0.01). Balloon allows the right QUANTEC dose-volume constraints in 7 out of 9 patients. A significant reduction of V78 mean value is observed, passing from a 4.0 cc to 1.2 cc. IMRT technique shows insignificant differences between cases. D50 is reduced of 3% while V78 remains about 1cc for both cases. QUANTEC limits are independently reached using IMRT. Dose comparison between 3DCRT techniques with balloon and IMRT technique without doesn’t show a clear advantage in using the experimental device.

PO-0827
Elekta Agility(TM) FFF for Lung VMAT SABR
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Purpose/Objective: It has previously been reported that VMAT reduces the overall treatment time for lung SABR compared to conformal therapy techniques. This study investigates whether the increased dose-rate available with Flattening-Filter Free (FFF) beams can be used to further decrease delivery times. An analysis was also made of FFF plan quality relative to standard (flattened-beam) plans.

Materials and Methods: 5 patients were planned for lung SABR with a dose of 55Gy in 5 fractions. VMAT plans with flattened 6MV beams(6X) and flattening filter free (6XXF) were compared. The 6XXF beam energy was tuned so that dose was matched to the flattened 6X beam energy at a depth of 10cm in water. All planning was performed with Monaco v3.3*1 for delivery on a Synergy*1 Linac with Agility*1 head. An isocentre positioned at the patient mid-line was used for all plans. Treatment deliveries were verified using the Delta4*2 phantom and chamber measurements in a CIRS*3 lung phantom. Plans were compared in terms of measured delivery time, gamma index and PTV point dose.

Results: Plans produced with both 6X and 6XXF had comparable plan quality (Table 1) and were produced in a similar time-frame. The VMAT production class solution used clinically for 6X treatments did not require alteration when planned with 6XXF. Dose deliveries for both