February´10 to September´15. To be included in the study, the treatment had to fulfill the criteria: (1) include a previous treatment of at least 45Gy of EBRT to the pelvis concomitant with cisplatin; (2) the BT boost consisted in insertion of interstitial Utrecht applicator under spinal anesthesia and individualized MRI planning. Each treatment was composed of 2 applications (7 days apart), with 2 separated fractions (in 24 hours) of nominal 7 Gy (the aim is to obtain the HR-CTV and IR-CTV D90 higher than 85 and 65 Gy EQD2 respectively keeping the OAR doses as low as possible with limits of D2cc of rectum and sigmoid lower than 70 Gy EQD2 and 85 Gy EQD2 in case of bladder). Applicator withdrawal was performed at the surgical theatre. Toxicity score (gynaecological bleeding) were defined by CTCAE v4.0.

Results: 110/122 (90.16%) patients were IIB stage or bigger, and in 68% of patients 6 needles were inserted in both applications. Median tumour volume at diagnoses was 39.8 cc (8.79-205) and median HR-CTV volume at first application was 18.01 cc (7.36-116.59). The final median biologically equivalent doses (EQD2) were D90 HR-CTV = 89.75 Gy10 (78.50-94.00) and D90 IR-CTV = 67.90 Gy10 (58.60-77.40).
For the first application, needles were used in all patients, and 4 (3.2%) patients required vaginal tamponade and/or stitch (Grade 2 CTCAE v4.0), and 2 (1.6%) patients required transfusion and/ or endoscopic intervention (Grade 3 CTCAE v4.0).
For the second application, needles were used in 114 patients, and 5 (4.3%) patients required vaginal tamponade and/or stitch (Grade 2 CTCAE v4.0) without bigger toxicities.

Conclusion: Our results suggest that interstitial IGBT as recommended by the GEC-ESTRO, is a safe option without life-threatening consequences due to bleeding, and dosimetric results compare favorably with the traditional technique.

PO-0960
Making MR-guided cervix cancer brachytherapy efficient: Are plan adaptation & daily planning needed?
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Purpose or Objective: MR-guided brachytherapy (MRgBT) improves local control and survival in patients with cervical cancer. It is expected that MRgBT will be standard of care within 5 years. MRgBT is more demanding of resources and optimized processes will be of great importance in assuring its widespread availability. Our aim was to determine the value of imaging and adaptive replanning prior to each MRgBT fraction compared to a less resource intensive approach tailored to specific technique considerations.

Material and Methods: A total of 20 patients with cervical cancer who received external beam radiotherapy (EBRT: 45-50.4 Gy in 1.8-2 Gy fractions) and high dose rate MRgBT (28 Gy in 4 fractions using 2 insertions) were included in this study. A tandem/ring applicator (TR) was used in 9 patients, and a TR with interstitial needles in 4 patients for all 4 fractions. In 3 of these 4 patients, further plan adaptation with increase in number of needles was performed for fractions 3 and 4. In the remaining 7 patients, a TR alone was used for fractions 1 and 2 and a TR plus needles for fractions 3 and 4 to improve target coverage or OAR sparing. All patients underwent MR imaging, contouring and planning prior to each fraction. To simulate a more efficient approach with only one plan per insertion, optimized fraction 1 plan was applied to fraction 2 anatomy, and optimized fraction 3 plan was applied to the fraction 4 anatomy. To assess value of plan adaptation, projected total dose from first insertion was compared to the final total dose following plan adaptation.

Results: There was no systematic change in the high-risk clinical target volume (HRCTV) across fractions (mean range 41-44 cm3). Mean cumulative HRCTVD90 with daily plan optimization was 92 Gy10, and the mean rectal, sigmoid and bladder D2cc doses were 67, 65 and 83 Gy3 respectively. There were no clinically significant changes in the mean HRCTV or OAR D2cc doses with only two plans prior to fractions 1 and 3. The GEC-ESTRO HRCTV target dose >85 Gy10 was achieved in 16/20 patients with either daily plan optimization or planning only twice. All GEC-ESTRO OAR target doses (rectum <75 Gy3, sigmoid <75 Gy3, bladder <90 Gy3) were achieved in 14/20 patients with optimized daily replanning, and this was maintained when only two plans were used. Plan adaptation with addition of interstitial needles for second insertion resulted in improved HRCTVD90 dosimetry in 6/10 cases and in improved OAR dosimetry in 4/10 cases.

Conclusion: MRgBT can potentially improve outcomes of cervical cancer patients but is more resource intensive. This study suggests that improvements in efficiency can be achieved through process analysis and optimization. While adaptive MR-based replanning is fundamental to achieving the benefits of MRgBT, replanning at strategic intervals may be as effective as daily replanning with considerable savings in resources.

PO-0961
Retrospective dosimetric comparison of TG43 and a commercially MBDCA for gynecological brachytherapy
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Purpose or Objective: To compare dosimetric plans using a commercially model based dose calculation algorithm (MBDCA) following TG186 recommendations, and the conventional TG43 method in an 192Ir high dose rate (HDR) gynaecological brachytherapy (BT) procedures using two types of cylindrical applicators.

Material and Methods: We analyzed the data of six patients with cervical carcinoma, receiving a 192Ir HDR brachytherapy treatment. The dose was delivered with a micro-Selectron afterloader. A treatment plan was performed using both the TG43 and TG186 dose calculation methods of the Oncentra Brachy v4.5 treatment planning system (TPS). Two cylindrical applicators, of 30 mm and 35 mm diameter were used: the Vaginal Applicator Set and the Shielded Cylindrical Applicator Set, by Nucletron. The treatment dose is prescribed at 0.5 cm distance from the cylinder wall (prescription point), with a treated extension of 3 cm. Analysis included dose volume histograms (DVH) for bladder and rectum and prescription point, according to American Brachytherapy Society (ABS) consensus guidelines (2012). The TG186 results were obtained using the standard accuracy level option of model-based algorithm (Oncentra Brachy-Advanced Collapsed cone Engine (ACE), Elekta), resulting in calculation times on the order of 40 s.