fractions in cervical cancer intracavitary-interstitial MR/CT-based BT.

Materials and Methods: 45 consecutive patient cervical cancer patients treated between January 2013 and May 2014 were considered. FIGO stage distribution was the following: 4 had stage IB, 33 had IIB (7 out of 33 with distal parametrial invasion), 7 had IIIB tumors (all because parametrial invasion up to pelvic wall) and 1 had IVA tumor. Treatment consisted in 3DCRT (45 Gy in 25 fr.) with concomitant chemotherapy (weekly cisplatin 40 mg m2) followed by MR/CT based IGABT (4 fractions of 7 Gy within 2 insertion with 1 week interval with Elekta Utrecht applicator). A stringent bladder filling and bowel preparation protocol is routinely used at our institution.

At 1st application, T2 MRI and i.v. contrasted CT (day 1 CT) with applicator in place were performed with an interval of 30 min (MR slice thickness 3,5 mm without gaps; CT thickness 2mm). Direct applicator reconstruction on MR images was performed and dose optimized to target volumes and OAR delineated on MR according GEC ESTRO recommendations. After patient treatment, original MR and CT datasets were fused based on the applicator coordinates and HRCTV contours from MR dataset transferred to CT. Further OARs were re-delineated on day 1 CT, applicator reconstructed and the original MR optimized plan recalculated on CT images. DVH parameters for OAR delineated on day1 CT were recorded (Intrafraction variability).

On the following day, a second CT was performed (2mm slice thickness). Furthermore day 2 CT was fused with the day 1 CT on the applicator coordinates and the original MR based HRCTV contours (present on CT day 1) transferred from day 1 CT to day 2 CT. OAR were then delineated on day 2 CT and the original MR optimized plan recalculated on CT day 2 images. DVH parameters for OAR delineated on day 2 CT were recorded (interfraction variability).

We assume in our study design that intra-fraction variability is predominantly due to systematic contouring uncertainties introduced by OAR delineation on different imaging modalities and less importantly by eventual OAR movements. We expect that interfraction variability to be of higher magnitude and predominantly due to OAR movements.

Results: Results are summarized in Tab 1. The magnitude of intra- and inter-fraction variability is very low probably with no clinical relevance in the vast majority of patients. Intra- and inter-fraction HRCTV and OAR variability is similar.

	MR day 1 / CT day 1 DVH variability (Gy)	MR day 1 / CT day 2 DVH variability (Gy)
HRCTV D90	0,11 ± 0,28	0,25 ± 0,42
Bladder D2cc	-0,14 ± 0,78	-0,1 ± 0,84
Rectum D2cc	0,04 ± 0,38	0,14 ± 0,33
Sigmoid D2cc	-0,09 ± 0,55	0,02 ± 0,61

Tab 1: interfraction and intrafraction dose variability in Gy (mean values ± SD)

Conclusions: Presented data together with previously published reports from Lang S. et al. (R&O 2013) seems to suggest that, in a protocol of four fractions within 2 different applications no re-planning is needed to safely deliver the second BT fraction of each application if an OAR filling protocol is applied. Nevertheless before applying this concept in the clinical routine more data are warranted.

PO-1015

High Dose Rate image guided adaptive brachytherapy for cervical cancer - a single centre experience

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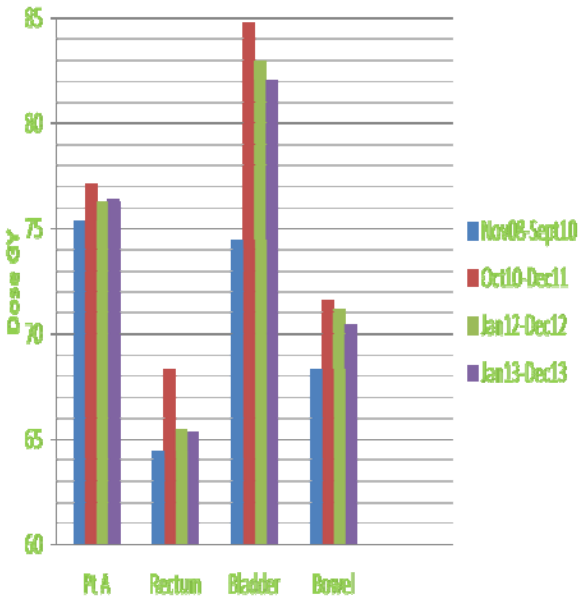
Purpose/Objective: To review doses achieved in the treatment of locally advanced cervical cancer at the Northern Ireland Cancer Centre compared to standards set by GEC-ESTRO since the introduction of image guided high dose rate brachytherapy.

To compare outcomes both in terms of recurrence and survival and long term toxicity with published outcomes.

Materials and Methods: Retrospective review of clinical notes and radiotherapy prescriptions of all patients with locally advanced cervical ca treated at the Northern Ireland Cancer Centre from 2008-2013.

Results: 188 patients with locally advanced cervical cancer were treated with radical intent with a median age 47.4 years (23.3 -79.80.4). Median follow up is 25.5 months. 180/188 had concurrent cisplatin. CT scanning was carried out after each intra-cavity insertion and used to contour OAR and to identify Point A. Equivalent doses in 2Gy fractions (EQD2) were calculated combining external beam radiotherapy and brachytherapy doses. αß 10 was used for tumour and αß3 used for organs at risk. Median dose to point A EQD2 was 76.4Gy (66.5-79.3) with 68 patients receiving less than <75Gy. Median dose to rectum was 65.5Gy (57.2-82.6)with 3 patients receiving more than 75Gy.Median dose to bowel was70.7Gy (55.5-79.2) with 26 patients receiving over 75Gy.Median dose to bladder was 80.5Gy (551-97.8) with 3 receiving greater than 95Gy. Pelvic recurrence at 3 years was 12.2% with distant metastasis 8.5% . Overall Survival (OS) at 3years was 74%. There was a documented pelvic or distant recurrence at 3years in 30.8% of node positive patients and 9.45% of node negative patients(p=0.005). Grade 3/4 late bowel and bladder toxicity of 7.9 and 6.3% respectively were documented. There were no significant differences in dose delivered in those patients who developed bladder or bowel toxity compared to those who did not. Mean dose to bowel in those who had Grade 3/4 toxicity was 71.2Gy and 70.0Gy without (p=0.20). Mean dose to bladder in those with GD3/4 bladder toxicity was78.9Gy and 79.6Gy without (p=0.81). Repeat MRI in the final week of radiotherapy was introduced in 2010 and performed in 97 patients. In those who had a complete response at final week MRI (30) there was 1 pelvic recurrence compared to 22 pelvic recurrences in those who had partial response or stable disease(77) (p=.0035).



Conclusions: CT guided high dose brachytherapy can be successfully implemented in a cancer centre achieving good levels of local control and overall survival. Node positivity on original MRI is predictive for recurrence.A complete response on week 5 MRI predicts for excellent long term pelvic control.

PO-1016

Assessment of quality of life in patients treated for gynecological cancers using the EORTC questionnaires

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Purpose/Objective: To assess self-reported quality of life (QoL) experienced by cervical and endometrial cancer patients after radiation therapy and in regular follow up. Our purpose is to evaluate QoL related to urinary and bowel symptoms and sexual functioning in order to identify patient- and disease-related influencing factors.

Materials and Methods: Since March 2011, 48 patients in regular follow-up for cervical cancer staged Ib1-IIIB (26 operated and 22 non -operated) and to 82 patients in follow up for endometrial cancer staged IA-IIIC (76 operated and 6 non -operated) after postoperative or radical pelvic radiotherapy ± brachytherapy boost were invited to fill in the anonymous EORTC-QLQ30 questionnaire. This questionnaire was combined with EN24 in case of endometrial cancer or CX 24 in case of cervical cancer. Exclusion criteria was the inability to understand the questionnaire. There was no limitation with regard to age or performance status. We analyzed overall health and overall quality of life, bladder symptoms, disuria and bladder and faecal incontinence. We also analyzed items related to sexual function (sexual interest and activity) and sexual symptoms (vaginal dryness).

Results: Everybody accepted to compile the questionnaire and only 5 patients needed some assistance. Most patients found that the questions were clear and easy to understand. Median age was 62.3 years (range 29-81). With a median follow up of 4.5 years (range 1.2-6.5), 78% of women were free of disease and 21% had evidence of tumour progression or relapse. All items exhibited good compliance with no missing values except those regarding sexual function that were missed in 37.5% of patients. The 92.5% of women judged their overall health and QoL good. In particular all patients with no evidence of tumour relapse judged a favorable QoL, and only 36% of patients with progression disease judged their QoL poor.

Table 1 shows the answers considering tumour type and treatment modality.

We calculated the Chi-Square Test to compare treatment modalities (operated or non-operated patients; pelvic external beam radiotherapy ± brachytherapy) and tumour sites (cervical or endometrial) for the various items. For all the items of Table 1, we did find a trend just below the threshold of significance (p=0.06-0.08).

ITEM	Cervix cancer – adjuvant EBRT+BRT	Cervix cancer - adjuvant EBRT	Cervix cancer – adjuvant BRT	Cervix cancer - radical EBRT	Cervix cancer - radical EBRT+BRT	Endometrial cancer – adjuvant EBRT	Endometrial cancer – adjuvant EBRT+BRT	Endometrial cancer – adjuvant BRT
Urinary urgency Quite a bit – very much	25%	37%	15%	15%	0%	28%	14%	0%
Leaking of urine Quite a bit – very much	30%	25%	0%	25%	0%	6%	5%	0%
Disuria Quite a bit – very much	25%	20%	15%	15%	0%	28%	14%	0%
Leakage of stools Quite a bit – very much	0%	0%	0%	0%	0%	0%	0%	0%
Abdominal cramps Quite a bit – very much	10%	0%	0%	0%	0%	0%	0%	0%
Vaginal dryness Quite a bit – very much	25%	40%	0%	-	-	19%	8%	0%
Vaginal discomforts Quite a bit – very much	25%	0%	0%	-	-	13%	0%	0%

Conclusions: From our analysis, it emerged a good QoL for the whole series with similar percentages for the different tumour types and treatment modalities. The presence of tumour progression reduced QoL. We found that patients treated for cervical cancer complained of higher incidence of disuria and bladder incontinence. No patient complained of severe symptoms related to gastro-intestinal dysfunction or faecal incontinence.

PO-1017

EQD 23Gy vaginal toxicity study in 2 protracted HDR brachytherapy schedules in postoperative endometrial cancer

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