evaluation and allows clearly define the contours of the tumor for planning brachytherapy.

EP-1264
Integrated EBRT dose escalation for pelvic lymph nodes positive uterine cervical carcinoma
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Purpose/Objective: Uterine cervical carcinoma is still remaining one of the main mortal reasons for female population in the developing world. Inspite of widely accessible screening and diagnostic procedures in the vast majority of cases in our country cervical cancer is revealed in locally advanced stages with metastasis in pelvic and paraaortal lymph nodes in up to 34% of patients. Concurrent chemoradiotherapy is the treatment of choice for cervical cancer today but the presence of positive lymph nodes require escalation of EBRT dose to these targets. The aim of this research was analysis of treatment results of 62 node positive cervical cancer patients.

Materials and Methods: We used the method of integrated boost by volumetric arc therapy (VMAT) to increase the EBRT dose in target while keeping relatively low doses at the organs at risk (bowel, rectum, bladder, femoral heads, pelvic bones). Planning was done in automatic regimen and the dose distribution was better (more conformal) if two dynamic arcs with 15 MV photon beams were used. Number of fractions were 25. Fraction dose prescribed to the pelvis (primary tumor and regional zone) was 2.0 Gy while to the metastatic lymph nodes - 2.3 Gy at the same fraction what makes totally 50 and 59 Gy respectively (EQD2 by α/β = 10). From the first day of treatment patients received concurrently weekly cisplatin in dose 40 mg/m2 (max. 70 mg), 5 infusions. After 46 day of treatment patients received concurrently weekly chemotherapy schedules followed by intracavity HDR brachytherapy. 59 patients received 3000cGy in 5 fractions (Group A) and 64 patients received 2400cGy in 4 fractions (Group B) of HDR intracavity brachytherapy. Patient characteristics were comparable between Group A and B, median age 48 (range 24 - 76) and 50 years (range 30 - 88) respectively. Squamous cell carcinoma was the most commonly observed histological subtype in both groups. Local control rates at 3 years are 75% and 81.6% for Group A and B respectively. Distant control at 3 years for Group A is 72.5% compared to 84.7% in Group B. There was no significant difference in DFS between Groups (log rank p = 0.16). OS at 3 years in Group A was 58% compared to 73% in Group B (log rank p = 0.059). The rate of fistula development was 6.8% and 4.7% for Group A and B respectively. Late G3 /4 toxicity rates in Group A were reported as 10.2% compared with 6.25% in Group B.

Conclusions: A reduced dose fractionation schedule to 2400cGy in 4 fractions is safely deliverable when compared to 3000cGy in 5 fractions. There is no increase in recurrence or late toxicity seen in our patient group. It may be a preferable treatment delivery schedule resulting in reduced theatre time, reduced number of insertions and anaesthesia requirement.

EP-1266
Interstitial brachytherapy using MUPIT in locally advanced or recurrent gynecological malignancies
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Purpose/Objective: Martinez Universal Perineal Interstitial Template (MUPIT) is a device designed for the treatment of pelvic malignancies or recurrences via perineal. This technique allows treating locally advanced gynecological tumors, with a better dose coverage than conventional intracavitary therapy. Because of the complexity of this technique, it is only performed in experienced centers. There are few reports of their use in the literature, and with a little number of patients in each study.
The purpose of this study was to assess characteristics, treatment outcomes and complications in patients with locally advanced or recurrent gynecological malignancies treated with interstitial brachytherapy using MUPIT.

**Materials and Methods:** We performed a retrospective review of all patients with gynecological malignancies treated with MUPIT in a single institution between January 2005 and May 2014. Cases without data or follow up were excluded. Information recorded were demographic and clinic characteristics, previous use of RT (external or BT), dose rate of interstitial BT, local control rate, late toxicity and mortality rate. Categorical variables are presented as frequencies and proportions, and continuous variables as the mean, median, and range. Local recurrence-free survival (LRFS) and overall survival (OS) after MUPIT treatment were estimated using the Kaplan-Meier method.

**Results:** Forty six patients were identified. The median age was 64 years (range, 28 - 85). Cervical and endometrial cancers were the most common primary site, with 20 and 16 cases respectively. The indications of interstitial BT were treatment of local recurrence (31), primary tumor (14) and metastases (1). Forty patients received external RT or BT before interstitial BT. High dose rate BT was used in 37 cases. Median LRFS was 76.2 months (CI 95% 61.6 - 90.7) and the median survival time was 82 months (CI 95% 67.5 - 96.5). There have been no cases of Grade IV late toxicity. Proctitis and pelvic pain were the most common grade III complications (4 patients).

**Conclusions:** Interstitial BT using MUPIT applicator is an effective treatment which obtains high rates of local control despite the bad prognosis of pelvic recurrences. Secondary effects are few, and manageable.

**EP-1267**

Defining a standard method for functional bone marrow sparing with IMRT for cervical cancer

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**Purpose/Objective:** Bone marrow sparing using intensity-modulated radiotherapy (IMRT) could reduce haematological toxicity from radical chemoradiation for cervical carcinoma. One challenge is to determine the location of functioning bone marrow rather than attempt to spare the whole bony pelvis. On FDG-PET the areas of higher activity correlate with SUV values, and the scans used to stage disease could potentially be used to also identify functioning bone marrow. The aims of this study were to identify functioning pelvic bone marrow using FDG-PET, to analyse the pattern of distribution between patients and to develop guidelines for defining bone marrow as an organ at risk which can be non-invasively monitored with MRI.

**Materials and Methods:** The FDG-PET scans from 10 patients treated for cervical cancer were assessed. Structure sets consisting 6 absolute SUV thresholds (0.5, 1.0, 1.5, 2.0, 2.5 and 3.0) were created. The volume of GTV was analysed for size, contribution to each region and to the total activity. The mean 18F-FMISO SUV-norm was 3.1 at baseline and 3.2 after 2 weeks (20-25Gy) and 7.7cc after 5 weeks (40-45Gy). Mean ADC values were 1.02x10⁻³mm²/sec increasing to 1.18x10⁻³mm²/sec after 2 weeks and to 1.27x10⁻³mm²/sec after 5 weeks and were 1.37x10⁻³mm²/sec at 3 months. All GTVs showed mean initial-enhancement (IE) followed by a plateau at an increasing IE at 2 weeks and washing out at 5 weeks. At follow up, the mean IE was 120% followed by a persistent enhancement. The mean 18F-FMISO SUV-norm was 3.1 at baseline and decreased to 2.3 at 2 weeks and 2.0 at 5 weeks and follow up.

**Conclusions:** There are morphological and functional changes in tumor diffusion, perfusion and hypoxia during treatment which can be non-invasively monitored with MP-MRI/PET.