70% in 2009. In unadjusted analysis, the cumulative rates of all-cause mortality, EC-specific mortality, and cardiac mortality were significantly lower in the IMRT vs 3DCRT group (all: 52.4% vs 74.5%, p<0.0001; EC: 40.3% vs. 55.6%, p<0.0001; and cardiac: 1.6% vs. 5.3%, p=0.0043). However, no difference was seen in deaths from pulmonary (0.96% vs. 1.55%, p=0.419) or other causes (9.6% vs. 12.1%, p=0.204). On propensity score-adjusted MVA, IMRT was not associated with EC-specific mortality (HR 0.87, 95%CI 0.69-1.06), pulmonary mortality (HR 1.04, 95%CI 0.29-3.79) or other cause mortality (HR 0.81, 95%CI 0.54-1.22) but was significantly associated with lower all-cause mortality (HR 0.83, 95%CI 0.70-0.98) and lower cardiac mortality (HR 0.35, 95%CI 0.14-0.88). Similar associations were seen adjusting for physician experience and sensitivity analysis removing hybrid radiation claims.

Conclusions: In this population-based analysis, IMRT use was significantly associated with lower all-cause mortality and cardiac mortality in patients with esophageal cancer.

OC-0125
Cyberknife-based reirradiation for head and neck cancers: dosimetric analysis and clinical impact on carotid vessels
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Purpose/Objective: Carotid blowout is an uncommon but serious complication of salvage reirradiation (Re-RT) for head and neck cancers (HNC). We evaluated carotid artery doses in high dose regions during Cyberknife-based fractionated stereotactic reirradiation (CK-FSRT) of HNC, and correlated them to complication risk.

Materials and Methods: Patients who received CK-FSRT from October 2012 to April 2014 were included. Entire course of internal or common carotid arteries ipsilateral to the high dose region either within or adjacent to the target volume was contoured, and doses to these vessels evaluated (Dmax, Dmean, D0.2 cc, D0.5cc, D1cc, V25, V30). The clinical course including responses and complications were prospectively recorded.

Results: Twenty-two patients received CK-FSRT during this period; of these, 13 (11 males, 2 females) with median age 56 years (range 31-83 years) received reirradiation, either for second primary (2) or recurrence (11); dose being 20-37.5 Gy, respectively for the FSRT plan, and median composite BED3 maximum was 100 Gy (55-146 Gy) and 92.3 Gy (39.9-137.3 Gy), respectively for the FSRT plan, and median composite BED3 maximum was 225 Gy (189-252 Gy). Six patients (7 vessels) had at least 50% volume within PTV. The patient who developed bleeding was a 73-year lady who had earlier undergone surgeries for 2 primaries. The first and repeat irradiation interval was 47.7 months and the respective dose-volume parameters for Re-RT (30 Gy in 5 fractions, prescribed to 74% isodose) were: Dmax 39.9 Gy, Dmean 36.2 Gy, BED3 Dmax (FSRT) 146 Gy, composite BED3 Dmax 252 Gy, and V30 18.9cc (100%).

Conclusions: During SBRT Re-RT, it is advisable to keep carotid Dmax BED3 (FSRT & composite) below 145 Gy & 220 Gy, respectively, though several other factors such as diabetes, carotid encasement, number of FSRT fractions, inter-RT interval & mucosal involvement contribute to risk. Evaluation of a larger number of patients with longer follow up and more events would help estimate the relationship between carotid doses and observed toxicity, which would serve as a useful reference to define respective dose constraints for Re-RT.

Symposium with Proffered Papers: Clinical outcome of image guided brachytherapy in cervical cancer

SP-0126
Dose response and dose effect of IGABT in cervix cancer
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The introduction of 3D image guided brachytherapy has been instrumental for reaching new knowledge about dose and effect in locally advanced cervix cancer treated with combined external beam radiotherapy and brachytherapy. Previous to the era of 3D image guided brachytherapy, dose assessment was mainly based on points for primary tumour (point A) and organs at risk (ICRU bladder and rectum points, and applicator related vagina points). ICRU rectum point dose was a successful predictor for rectal bleeding - however, the point dose assessments associated with tumour, bladder and vagina has not been sufficiently specific to result in consistent evidence on dose and effect for local control and bladder/vaginal morbidity. During the last decade, the GEC ESTRO recommendations on contouring, dose reporting, applicator reconstruction and imaging for 3D MRI guided brachytherapy have spread throughout the world. This has significantly moved the field forward, and currently, a vast new experience is being built up on dose and effect with regard to both tumour control and morbidity.

As one of the largest clinical initiatives in 3D image guided brachytherapy, the GEC ESTRO Gyn network initiated the prospective EMBRACE trial in 2008 (International Study of MRI guided Brachytherapy in Cervix Cancer) (www embracestudy dk). EMBRACE comprises 27 key international centers who deliver MRI guided brachytherapy in locally advanced cervical cancer according to the GEC ESTRO recommendations. The aim of the EMBRACE protocol is to benchmark MRI guided brachytherapy in a multicenter setting within the frame of a prospective observational study and to correlate image based DVH parameters for the clinical target volume and for organs at risk with outcome. More than 1200 patients have been enrolled, and accrual will finalize in 2015. Furthermore, the retrospective retroEMBRACE study has enrolled >700 patients treated with image guided brachytherapy from 12 international centers
(www.retroembrace.com). Data from the EMBRACE and retroEMBRACE studies show significant correlation between dose and outcome for both local control and morbidity (bladder, rectum, bowel, vagina). While there is currently not international consensus on dose planning aims and dose prescription in cervix cancer, the dose effect data from the EMBRACE and retroEMBRACE studies will change this situation. The upcoming evidence can be used to recommend certain dose planning aims and dose prescription levels. A new study (EMBRACE II) will for the first time implement a prospective dose prescription protocol for both target and organs at risk based on clinical outcome data from EMBRACE and retroEMBRACE. EMBRACE II will be initiated in 2015.

SP-0127
Clinical impact of IGABT in cervical cancer
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Abstract not received.

SP-0128
Patient reported quality of life with IGABT in cervical cancer
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Image guided adaptive brachytherapy (IGABT) as part of combined radiochemotherapy for locally advanced cervical cancer is associated with improved rates of local control with simultaneous decrease in morbidity compared to use of standard brachytherapy plans in several institutional series. Besides tumor control and morbidity, health related quality of life (HR-QoL) including patient reported symptoms can provide additional important information to evaluate treatment efficacy. While clinician-assessed morbidity scales are objectively defined, patient reported symptoms provide a subjective evaluation without clinical interpretation. Several studies have pointed out that there can be considerable underreporting of morbidity when patient reported symptoms are taken into account, especially for low grade morbidity. Comparison of HR-QoL results with age matched normal population data can help to point out which symptoms or issues are most prevalent during further follow-up after treatment. In addition these results can provide patients with more detailed information on what to expect during follow-up.

Most HR-QoL studies in patients with cervical cancer report on a cross-sectional cohort, are not prospective, and have included patients with different treatments and gynaecological malignancies. Despite these limitations, in general radiochemotherapy for locally advanced cervical cancer has found to have a considerable impact on HR-QoL and patient reported symptoms. During treatment patients report more symptoms of fatigue, nausea, appetite loss, diarrhea, pain and insomnia, affecting global health status and emotional, social and role functioning, although part of these symptoms recover over time. Most studies with longer follow-up after treatment still find impairments in functioning compared to the general population. And some of the symptoms may persist years after treatment, like diarrhea, urinary frequency and leaking of urine. In addition, survivorship studies indicate that sexual symptoms are prevalent and sexual functioning is frequently impaired and a major source of distress.

The EMBRACE study (www.embracestudy.dk) investigated the introduction of IGABT in a multicentre setting and included prospective HR-QoL assessment with EORTC quality of life questionnaires. This trial started in 2008 and has included over 1200 patients. In an interim EMBRACE report, a comparison between CTCAE morbidity and EORTC patient reported symptoms confirmed that there was considerable underestimation between both endpoints. Preliminary EMBRACE HR-QoL results of this study including a comparison with age matched norm population data will be presented.

In conclusion, HR-QoL outcomes provide useful additional information besides tumor control and clinician-assessed morbidity. These outcomes provide useful information when counselling patients on what to expect regarding functioning and symptoms. Patient reported HR-QoL and symptom endpoints can play and important role in future research in order to to optimize the therapeutic window, to decrease most prevalent symptoms and to increase patient functioning and HR-QoL during follow-up.

OC-0129
Image-guided adaptive brachytherapy in cervical cancer: towards a personalization of planning aims
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Purpose/Objective: To identify prognostic factors for local control in patients treated for locally advanced cervical cancer with image guided adaptive brachytherapy, and analyse their potential impact on planning aims.

Materials and Methods: Patients treated with curative intent by a combination of external beam radiotherapy and pulsed-dose rate brachytherapy were selected. Local failure was defined as any relapse in the cervix, vagina, parametria, or uterus during follow-up. Prognostic factors were selected based on log rank tests and then analyzed with a Cox model. Dose/effect correlations were performed using the Probit model.

Results: Two hundred and twenty-five patients treated from 2006 to 2011 were included. According to the FIGO classification, 29% were stage IB, 58% stage II, 10% stage III, and 3% stage IV; 95% received concomitant chemotherapy. Thirty patients were considered having incomplete response or local failure. Among the selected parameters, D90 for HR-CTV, D90 for IR-CTV, the overall treatment time, the TRAK, and the HR-CTV volume appeared significantly correlated with local control in univariate analysis. In multivariate analysis, overall treatment time > 55 days and HR-CTV volume > 30 cm3 appeared independent. The Probit analysis showed significant correlations between the D90 for both CTVs, and the probability of achieving local control (p=0.008 and 0.024). The thresholds to reach to warrant a probability of 90% of local control were 85 Gy to