Purpose/Objective: Whilst moderate hypofractionation radiation therapy (HFRT) is routinely used in many European centres data supporting its use in Indians is unavailable. Indian patients were likely to present with more advanced disease and there are questions on biological dissimilarity between Caucasians and Indians. This analyses reports the demographic data, toxicity profile and control outcomes of the breast cancer patients.

Materials and Methods: From May 2011 to January 2014, 496 patients with breast cancer underwent HFRT with 3DCRT (4005cGy in 15 fractions) to whole breast or chest wall and/or supraclavicular fossa following curative surgery. The demographic data with respect to age, sex, neoadjuvant chemotherapy, type of surgery (modified radical mastectomy (MRM) vs Breast conservation surgery (BCS), histopathology (grade, tumour size, nodal status, ER/PR/Her2Neu status, margins and LVI), Nottingham Prognostic Index score (NPI) and Cambridge score were analyzed. Locoregional (LRR) and distant failures were analyzed using Kaplan Meier curves, univariate and multivariate analyses was done using the Cox regression model to identify predictors of failure.

Results: The mean age at presentation was 52 years (23 – 88 years) and 206 patients (41.6 %) had breast conservation surgery. Patients who are younger than 40 years had higher rates of breast conservation surgery (p=0.01) irrespective of the tumour size. The histopathological variables and prognostic indexes were not significantly different across various age groups. The hypofractionated radiation therapy was well tolerated with 1.2 % and 7.1% having grade 3 and 2 acute skin toxicity. At 6 months 13.5% had Gr 1 and 1.6% Gr 2 lymphoedema, 5% reported distortion with no reported long term pneumonitis or cardiac complications. The median follow up period was 18.5 months. 90.2 % of the patients were on regular follow up. The crude LRR and distant failure rate was 3.42% (17 patients) and 7.66% (38 patients). In patients who failed loco-regionally had higher NPI score, greater than 70% had node positive, tumour size > 2 cm, Gr 3 tumours. In univariate Cox regression analysis, patients with positive nodal status (p=0.007), grade 3(p=0.003), MRM (p=0.034) and triple negative status (p=0.027) had significant higher distant failure rates while nodal status (p=0.005) alone stood significant risk factor for LRR. In multivariate analysis, node positivity was remained significant for locoregional recurrence but none of the factors were significant for distant metastases. The actuarial locoregional failure and distant metastases at 2 years were 3.4 % and 11.2% respectively

Conclusions: HFRT was well tolerated and loco-regional and distant failure rates were comparable to the published data establishing its safety and effectiveness in Indian population. Node positivity, grade 3 and triple negative tumours are more aggressive and tend to have higher locoregional and distant failure.

Radiation doses to cardiac structures in women treated for breast cancer in Sweden and Denmark between 1958 and 2001


1University of Oxford, Clinical Trial Service Unit, Oxford, United Kingdom
2University of Southern Florida, Clinical Trial Service Unit, Tampa, USA
3University of Southern Denmark, Institute of Clinical Research, Odense, Denmark
4Aalborg Hospital, Oncology Department, Aalborg, Denmark
5University of Oxford, Gray Institute for Radiation Oncology & Biology, Oxford, United Kingdom
6University of Oxford, The George Centre for Healthcare Innovation, Oxford, United Kingdom
7Karolinska Institutet, Unit of Cardiovascular Epidemiology, Stockholm, Sweden
8Karolinska Institutet, Department of Medical Epidemiology and Biostatistics, Stockholm, Sweden
9K. Rahimi, University of Southern Denmark, Institute of Clinical Research, Odense, Denmark
10University of Oxford, Clinical Trial Service Unit, Oxford, United Kingdom
11University of Oxford, Clinical Trial Service Unit, Oxford, United Kingdom

Purpose/Objective: To report the distribution of radiotherapy dose within the heart of women irradiated for breast cancer in Sweden and Denmark between 1958 and 2001, who later developed a major coronary event. In the future, these doses will be used to assess the association between the spatial distribution of radiation dose in the heart and the location of cardiac damage.

Materials and Methods: 487 women irradiated for breast cancer between 1958 and 2001 and who subsequently developed a major coronary event with known location of cardiac damage were included in the study. Each woman's radiotherapy chart was reviewed, and categorised according to the regimen used. The four most commonly used treatment regimens were reconstructed on 10 randomly selected CT planning scans of women irradiated for breast cancer at Odense University Hospital in the year 2010. One representative patient was selected who was typical for mean cardiac doses. All regimens identified were then matched the different sites of cardiac damage for the women studied. Several sources of dosimetric uncertainty were considered.

Results: 31 regimens were identified and these were further categorised into six: left and right tangential irradiation, left and right direct electron or orthovoltage irradiation and left and right direct megavoltage regimens. The estimated mean heart dose ranged from 3-27Gy for left-sided treatment and 0.6-27Gy for right-sided treatment. Doses to different segments of the left ventricle varied substantially e.g. left tangential irradiation delivered 10-48Gy to the apex but only 0.3-5Gy to the inferior segment. Coronary artery doses also varied between regimens. Left-sided regimens resulted in highest doses (3-46Gy) to the left anterior descending coronary artery whereas right-sided regimens gave highest...
doses to the right coronary artery (0.4–35Gy). Analyses of cardiac doses for the 10 randomly selected CT scans showed considerable inter-patient dose variation for left tangential radiotherapy but less variability for left direct beams.

Conclusions: Doses to cardiac structures varied considerably depending on the regimen used. These doses can be used to assess which parts of the heart generally received higher doses relative to other parts of the heart. For example, left sided tangential radiotherapy tended to give higher doses to the apex compared with the other ventricular segments. Left sided regimens tended to deliver high radiation doses to the left anterior descending coronary artery, and right-sided regimens tended to deliver high doses to the right coronary artery.

Poster: Clinical track: Gastrointestinal tumours (upper and lower GI)

**PO-0692**

Role of neo-adjuvant radiotherapy in rectal cancer - less is more?

M. Qamar¹, H. Gourier¹, M.A. Hawkins², R. Hompes³, R. Muirhead⁴

¹Oxford University Hospital, Department of Oncology, Oxford, United Kingdom
²CRUK/MRC Oxford Institute for Radiation Oncology, Department of Oncology, Oxford, United Kingdom
³Oxford University Hospital, Department of Colorectal Surgery, Oxford, United Kingdom

**Purpose/Objective:** Neo-adjuvant radiation in rectal cancer improves R0 resection rates and reduces local relapse. ESMO and UK National Institute of Clinical Excellence (NICE) guidance advocate consideration of short course radiotherapy (SCRT) or long course chemoradiotherapy (CRT) for intermediate risk rectal cancer and CRT for high risk tumours. However the Mercury group suggests only selected high risk tumours require neo-adjuvant CRT. As such there remains controversy regarding patient selection for radiation, with significant variations in current practise. Our use of radiotherapy over a 5-year period has mirrored Mercury guidance; we aim to assess the application of this guidance in a routine clinical setting.

**Materials and Methods:** A retrospective analysis was performed, at a single tertiary referral centre, of patients receiving radical surgery for primary rectal cancer from 2007 to 2012. Using multiple hospital electronic data-bases, we collected patient demographics, radiological TNM stage and CRM status, radiation delivered, pathological presence of extra mural vascular invasion (EMVI), R1 resection and local relapse rates. Risk stratification was based on the NICE criteria.

**Results:** A total of 275 patients were identified. Of these, the proportion with T1, T2, T3 and T4 tumours was 12%, 17%, 58% and 13% respectively. The percentage of patients with N0, N1 and N2 was 52%, 30% and 18% respectively. 1% of patients had low volume metastatic disease. 40% had threatened/involved CRM and 29% of the tumours had EMVI. Only 5% of the patients had R1 resection. The proportion with low, intermediate and high risk were 18%, 42% and 40% respectively. No patient received SCRT. 82% of the high risk patients and only 8% of intermediate risk received long course CRT. Median follow up was 54 months (range 15 to 60 months). 4 patients had synchronous metastases and hence were excluded from follow up. Of the remaining 271 patients, the rate of local and distant recurrence was 2% and 20% respectively. In the intermediate risk group, the R0 rate was 97% and the local relapse rate was 1.7%.

**Conclusions:** This data concurs with the Mercury guidance that only selected high risk rectal cancer patients require CRT. Over a 5 year period despite the increasingly narrowed selection of patients for CRT we have maintained a local relapse rate of 2.5%. The intermediate risk group had acceptable R0 resection and local relapse rates; therefore we would suggest that there is no role for SCRT in rectal cancer. Lastly, due to the significant rate of distant relapse, our data concurs with current plans to investigate the role of neo-adjuvant chemotherapy in rectal cancer.