	Heart volume		Volume change		
	# 2	# 19	Δ #19-#2		
	cc	cc	cc	%	*p-value*
Whole group: mean (SD)	996 (258)	928 (256)	-69 (70)	-7.0 (6.0)	p<0.001
Neo-adjuvant protocol: mean (SD)	1033 (267)	968 (259)	-66 (76)	-6.2 (6.0)	P=0.002
Inoperable protocol: mean (SD)	884 (205)	807 (222)	-77 (54)	-9.4 (6.6)	p=0.016

Table 1: The measured heart volumes.

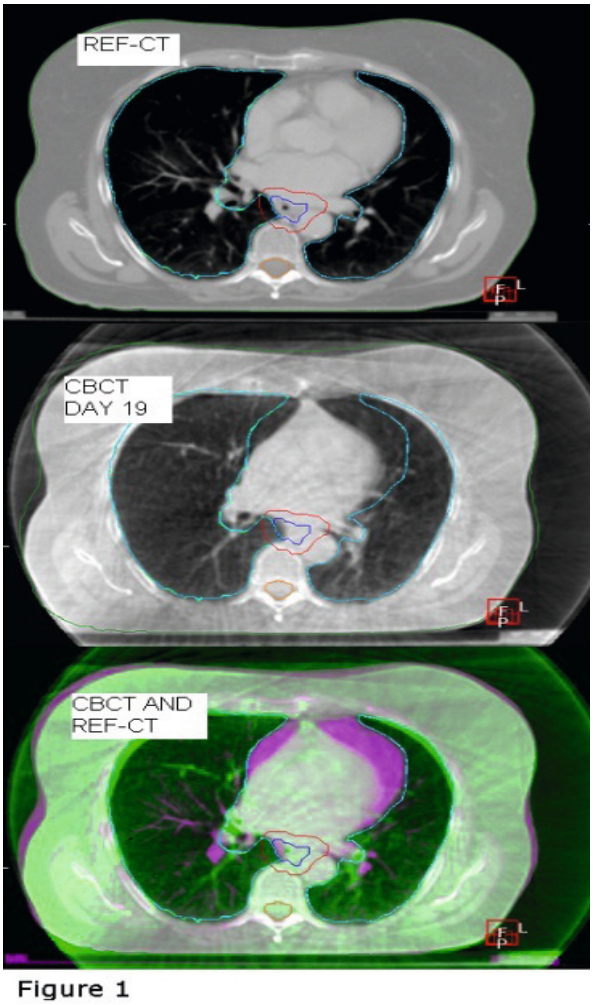

Figure 1

Conclusions: A significant volume reduction of the heart was demonstrated during chemo radiotherapy treatment for patients with oesophageal cancer. Additional studies are carried out to identify its determinants.

PD-0274

18F-FLT and 18F-FDG PET imaging of proliferation and glucose metabolism in radiotherapy planning of cervical cancer

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Purpose/Objective: The assessment of the extend of the tumor mass and its metabolic activity has been reported to have an important role in radiotherapy planning. Positron emission tomography is a non-invasive imaging method considered very helpful in the evaluation of metabolic activity of tumor mass in vivo. The purpose of the study was to compare the molecular activity of cervical tumor before radiotherapy planning, based on glucose metabolism and proliferation image, measured by PET/CT.
Materials and Methods: The study population comprised on 13pts (aged 59±15years) with histologically confirmed cervical cancer. All pts were injected with 185MBq of [(18)F]-fluoro-3'-deoxy-L-thymidine([(18)F]FLT) (IASON, Austria) and 370MBq of 2-[(18)F]-fluoro-2-deoxy-D-glucose ([(18)F]FDG) (FCON, Germany) on two separated days. The acquisition over abdomen and pelvis were performed twice using PET/CT scanner (Gemini TF Philips, USA). The collected data was reconstructed using dedicated Philips workstation. On reconstructed images the tumor borders were evaluated using semiautomatic dedicated software based on 30 % threshold method. Metabolic parameters of the tumor tissue and the tumor volume were evaluated on each nuclear image. For statistic analysis T-test was used.
Results: There was nosignificant difference (p>0.05) in the tumor volume calculated on FDG images (83.3±55.4cc) and FLT images (86.3±67.2cc). The maximum standardized uptake values (SUV) of the tumor were similar in both examination- SUVmaxFDG=10.8±2.7, SUVmaxFLT=8.2±3.6; p>0.05. The mean SUV values in FDG images showed significantly higher values than on FLT images (SUVmeanFDG=5.1±1.2, SUVmean FLT=3.4±1.1; p<0.05). No correlation was observed between glucose metabolism and proliferation activity in the evaluated patients (r=0.3).
Conclusions: There are no significant differences in tumor volume calculation based on FLT and FDG image data.The proliferation activity in cervical cancer did not correlate with glucose metabolism in the tumor mass and this phenomenon should be further evaluated in radiotherapy strategy planning and prognosis.

POSTER DISCUSSION: 8: PHYSICS: DOSE CALCULATION AND PLANNING

PD-0275

The influence of phase space and polarisation on MRT dose distributions

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Purpose/Objective: Microbeam Radiation Therapy (MRT) is a new treatment strategy that utilizes arrays of micrometer sized parallel beams with high peak doses, separated by low dose regions of a few 100 µm width. This beam setup has shown high tumour control while sparing surrounding normal tissue. In order to avoid dose blurring and maintain steep dose gradients in the patient synchrotron radiation is required. A special property of synchrotron radiation is its linear polarisation. The influence of polarisation on MRT doses has been a matter of debate in recent years. Furthermore it has been discussed whether the assumption of ideal parallel beams, originating at the collimator is valid or whether a full description of the phase space (PS) is required. We have systematically studied the influence of the PS and the polarisation at different positions in the microbeam (MB) field. We compare dose simulations with measurements at the biomedical beamline ID17 at the ESRF in Grenoble, France.
Materials and Methods: Monte Carlo simulations were carried out in Geant4.9.3.p02 employing the physics of the Livermore low-energy libraries. The target was a water box of 16x16x16 cm^3 as in the experiments. Simulations were done with and without PS. The PS at the ID17 was described by I. Martínez-Rovira, Med. Phys. 39(1) 2012. Calculations were performed with polarised and non-polarised photons.
Results: The simulation of an infinitesimal pencil beam reveals varying influence of the polarisation depending on the distance from the beam. Comparing dose perpendicular and parallel to the polarisation direction, there are 3 regions to differentiate: The region within the mean free path length of electrons (< 10 µm) with dose differences of up to 400 %, the region of electron scattering with negligible dose differences and the region of photon scattering with deviations of up to 60 % depending on the depth in the phantom. However, in a MB field it becomes apparent that the peak-to-valley dose ration (PVDR) depends mainly on electron scattering. Apart from