AbstractID: 1140 Title: Analysis of prostate deformation due to different MRI/MRS endorectal coils for image fusion and brachytherapy treatment planning

Combined anatomic (MRI) and metabolic (MRSI) imaging is used to define the validated cancer lesion within the prostate for the dose escalation purpose. For the acquisition of high spatial resolution (≈ 0.3cc) MR spectroscopic imaging (MRSI) data, an endorectal coil (ERC) is mandatory. However, its presence causes distortions of the prostate and of the surrounding organs, making it difficult to use MRI/MRSI data directly for CT or MRI planning. In this study, the extent of the deformation of the prostate produced by the balloon ERC (five patients) versus the rigid ERC (fifteen patients) was measured to select which ERC should be used for the fusion of MRI/MRSI data with planning CT or MRI in high dose rate brachytherapy. ERC forces the prostate to tilt anteriorly with an average of 19.4 degree on sagittal view (19.5 and 19.2 degree for rigid and balloon ERC, respectively). The ERC compress the prostate in the antero-posterior (AP) direction with an average of 1.2 and 4.7 mm for rigid and balloon ERC, respectively. In the lateral direction, the prostate is widened with an average of 1.5 and 6.1 mm due to rigid and balloon ERC, correspondingly. In conclusion, the rigid ERC creates less deformation. The rigid ERC MR images can be aligned to MR images (no ERC) by manually rotating and translating the ERC MR images with a precision of 2 mm in the AP and lateral direction.