AbstractID: 13187 Title: Feasibility Study and Clinical Application of Partial Conebeam Computed Tomography (pCBCT) for Boost Braest Treatment in RT

Purpose: To investigate the feasibility of using partial CBCT (pCBCT) as a setup aid for boost field verification of conventional breast treatments in RT

Method and Materials: Elekta XVI Linacs (Synergy) and XVI (v. 3.5) are used to take pCBCT images of the boost breast with S20 collimator, H&N Reconstruction options, and 240^{o} scan angles. 2 breast phantoms are used: water-filled mannequins phantom, and acrylic cone attached onto humanoid phantom. They are used to estimate the patient dose, and to investigate geometrical distortions caused by partial volume scans: mainly determined by clearances between patient body and treatment head. The commercial XVI software is used without any modifications. CT images with extra contours including surgical clips, lung, skin, and nipples with their 3-5mm margins are exported and correlated with those in pCBCT images. The patient dose was also measured with standard commercial phantom with pencil chambers using a commercial phantom using TLD.

This pCBCT procedure has been used to determine its clinical advantage with 8 patients compared with MV/KV images. All the surgical clips are well defined in 3 planes of the pCBCT images. The image fusion is based upon bone, clip, skins, and/or breast implant. They are mainly chosen by a physician.

Results:
The setup uncertainties can be as much as 8mm, which seems to be related to deformation of the breast, and seroma changes. The clips can be defined in the 3 planes or all the patients. The MV/KV portal images are used to confirm the image matching procedure of partial CBCT.

Conclusion:
The pCBCT is a reliable and convenient tool to verify the treatment setup as well as treatment fields. The pCBCT with smaller collimators (16cm*20cm, and 12cm*20cm) are under investigation to improve image quality so that the seroma could be defined for the ABC breast patients.