

AbstractID: 4816 Title: Practical reconstruction method for 3D CT-Based Brachytherapy with shielded colpostats

Introduction and purpose.- The most extended worldwide HDR and PDR afterloading machines are from Nucletron, using the Plato Treatment Planning System (TPS) to perform the clinical dosimetry. The Fletcher-Williamson (FW) vaginal colpostat applicators are widely used with these machines, they are made of a very dense material (densimet-17) which allows shielding up to 50% of the dose. Almost all the TPS have incorporated the CT-Based Brachytherapy (BT), in which the CT catheters and applicators reconstruction is based on contiguous CT transverse slices where the user points the catheter position. The problem with these applicators is the production of artefacts that makes the reconstruction impracticable. CT Orthogonal Scout Views or scanograms (OSV) to reconstruct sources in Brachytherapy, have been well described (Meli 1995, Yue 1999). The purpose of this work is to incorporate the OSV reconstruction method to the PLATO TPS.

Material and methods.- We have taken profit of the fact that the TPS keeps the CT coordinates. A spread sheet has been developed to reconstruct the FW from OSV. The advantage of this method is that the obtained catheter coordinates are referred to the CT coordinates. The obtained OSV points are introduced on TPS as markers in the contouring routine because the TPS does not allow direct catheter coordinate input. Even in the catheter reconstruction routine it is easy to follow the markers to recognize the catheter within the FW.

Some phantoms have been built with pellets to check the procedure accuracy.

Results.- The global OSV accuracy obtained with the phantom tests is estimated to be within 1 mm. Significant step by step examples will be shown.

Conclusions.- The method is easy and feasible for Plato TPS users, and not only for shielded colpostats but also for implants quasi parallel to the CT slices as breast implant.