Purpose:

To develop a QA tool and methodology to be used with an Elekta SL 25 Linear Accelerator retrofitted with a 3DLine Micro-MLC gantry attachment in a room installed with the 3DLine Dynatrac camera localization system.

Methods:

A phantom was manufactured from clear polyester casting resign. This phantom was designed to fit within the localizing head frame to test the accuracy of the 3DLine camera system in terms of isocenter localization. The phantom was aligned using the imported isocenter coordinates from the ERGO++ TPS. The phantom consists of metallic wires intersecting at the center and extending outwards to the center of each of the six sides of the cube. Gafchromic film was taped to each side and the cube was irradiated at different gantry and couch angles to verify isocenter accuracy to within 1mm in accordance with TG 142. The films were analyzed with RIT113 software, using the 50% isodose curves as the field edges and the center of the field as marked by each of the wires extending outwards from the isocenter.

Results:

Preliminary results of this isocenter test with the retrofitted Micro-MLC gantry head attachment show a deviation of 0.72mm and -1.25 in the x and y directions respectively for the 90° gantry angle. A deviation of -1.27mm and -2.35mm in the x and y directions, respectively were measured for the 270° gantry angle. The additional sides will be irradiated and their results along the results of the additional tests will be presented at the AAPM national conference.

Conclusions:

After successful completion of the above procedures for SRS QA, it was determined that the phantom made with the localization wires can indeed be used to accurately and efficiently QA a linac-based SRS system for isocenter location accuracy.

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No conflict