AbstractID: 11658 Title: MLC quality control evaluation combining dynalog files and portal dosimetry using proprietary software

Purpose:
MLC quality control evaluation combining dynalog files and portal dosimetry using proprietary software

Method and Materials:

The MLC positioning and gap precision plays an important role in the dose delivery for IMRT treatments. The MLC controller verifies the position of each leaf every 50ms, compares with the planned position and generates a log file called dynalog for each carriage. We created a dynamic MLC movement test based on the standard Picket Fence test, but without the 1mm strip and using every 120 leaves. We deliver this test in a daily basis generating the dynalog files and acquiring the portal dosimeter integrated image (PD). Proprietary software was developed in C# to correlate the information from dynalog files and the PD exported ASCII file. The evaluation parameters chosen for the dynalog analysis were: 99% of the control point deviations below 1mm, no beam hold off and no errors greater than 2mm. For the PD we compared a measured with a reference image using the gamma method parameters distance to agreement of 2mm and dose difference of 3%, where 99% of the points were below Gamma 1 (score) for a specified ROI.

Results:
During 2 months 50 dynalogs files and PD were analyzed showing that 44 of them were in accordance with the allowable values limits showing an average score of 99,8% (99,6-100%). However, 6 tests failed showing errors above 1mm and average score 93% (90-96%). It happened due to a reduction in the performance of some MLC motors that lately had to be replaced.

Conclusion:
The method developed can be a predictor of MLC failures in the morning quality control preventing maintenance and beam hold off's during patient treatments.

Conflict of Interest (only if applicable):