

AbstractID: 8117 Title: A Quality Assurance test based on gamma analysis of fluence test patterns for HDR brachytherapy

Purpose: To perform a Quality Assurance test based on gamma analysis of fluence test patterns for HDR brachytherapy

Method and Materials: A phantom using physiotherapy wax material was made to carryout the study. Five stainless steel interstitial needles of 20 cm length with beveled point end and 1.5mm outer diameter were implanted. A computed tomography image of the phantom with 1mm slice thickness was obtained. Patient specific treatment plans were generated and the fluence maps at the reference plane for all plans were generated. All the treatment plans were transferred to the MICROSELETRON HDR machine and the fluence was delivered. Gafchromic and EDR2 films were placed at the reference plane i.e., 5 mm from the center of the implant for measuring the fluence. The calculated and measured fluences were then compared and analyzed using commercial software (PTW VERISOFT) based on the gamma index method.

Results: As there are no specific guidelines for the DD and DTA values to be used for brachytherapy, various combinations of DD and DTA values were tried and analyzed .The results for both EDR2 and Gafchromic films were analyzed. The response of Gafchromic film at various times after irradiation was also included in the analysis.

Conclusion: The results indicate that 2 mm DTA and 10 % DD is optimum for gamma analysis of fluence test patterns for QA in HDR brachytherapy. Radiochromic films are a better choice than EDR2 films. Like patient specific QA procedures practiced widely in IMRT based on gamma analysis, a similar approach in HDR brachytherapy can be adopted.

Conflict of Interest (only if applicable):Nil