

AbstractID: 13030 Title: A Study of Computed Radiography for High Dose-Rate Brachytherapy Source Position Quality Assurance

Purpose: To search the suitable parameters of CR system, as a replacement for film for quality assurance of the source position in HDR brachytherapy. **Method and Materials:** The HDR treatment machine used in this study is a Nucletron Microselectron HDR unit. It has an Ir-192 source which the activity of 3.398 Ci. The Fuji FCR plate was exposed as a single co-registered image by superimposing a source autoradiograph with an overhead radiograph of a dummy x-ray marker. By varying the autoradiograph time from 0.1 to 1.0 s and the diagnostic radiograph was 125 kVp and 25 mAs. The CR images were read in the fixed Exposure Data Recognizer (EDR) mode. The image processing parameters of the Latitude (L) and the Sensitivity (S) were varied from 1 to 4 and 20 to 60 respectively. The visual inspection was used for the comparison methodology. **Results:** The co-registered CR images were well suited to qualitative assessment by visual inspection. The suitable autoradiograph irradiation time was less than 0.7 s and the exposure technique was 125 kVp and 25 mAs. The suitable parameters of image processing were L=1-2 and S=20-40. Because of CR much higher sensitivity than film, there is more scatter around the source than film. **Conclusions:** CR might substitute the traditional radiographic film. It is no need for a wet developer and the image plate can be reused, thus controlling cost for the department. CR could be a better technique or at least a back-up one. Future investigation will include the use of the brass plate to absorb the scatter ray, to improve the image quality.