

## AbstractID: 13517 Title: Evaluating skin dose and dose distribution for the transcatheter arterial embolization

**Purpose:** The purpose of this study is to evaluate the entrance surface doses and dose distribution using Gafchromic films for patients who underwent the transarterial embolisation (TAE) for hepatocellular (HCC) by a flat-panel angiographic system.

**Methods and Materials:** Interventional fluoroscopy procedures may present deterministic and stochastic risk. The ICRP report No. 85 determined that patient doses for tumor embolisation belong to medium dose level. The FDA also suggested that the threshold absorbed dose in skin of 1 Gy should be recorded. In this study, three cases were performed on a digital flat-panel angiographic system (Siemens Axiom dBA system software version VB31). The cumulative skin dose, frames of digital subtraction angiography, and fluoroscopy time were recorded, whereas the dose-area product (DAP) was measured by the build-in transmission chamber. The skin dose distribution was measured with Gafchromic XR-RV2 films. According to the skin dose limit of ICRP and US Nuclear Regulatory Commission, averaged doses of hot-spot areas with 10 and 100 cm<sup>2</sup> were also evaluated. **Results:** The measured peak surface dose (PSD), mean dose, 10- and 100- cm<sup>2</sup> area dose were 1538±1214, 153±104, 1404±1047, 1030±761 mGy, respectively. The mean DAP values, cumulative skin dose, fluoroscopy time, and frames of DSA were 230±167 Gy-cm<sup>2</sup>, 40±22 minutes, 1991±1572 mGy and 105±91 frames, respectively. Only one case had the ESD over 1 Gy with 129-cm<sup>2</sup> skin area, and received over 2Gy with 41-cm<sup>2</sup> skin area. **Conclusions:** The Gafchromic XR-RV2 films are easy-to-use for measuring the entrance surface dose and have advantages to provide the dose distribution of skin. This study indicated that the patient doses are in the range of hundreds of mGy, which might cause deterministic effect and further dose reducing techniques are needed.