

## AbstractID: 2889 Title: Evaluation of Setup Accuracy for Hypofractionated Radiotherapy of Liver using Portal Imaging and On-line kV Fluoroscopy

**Purpose:** To compare image-guided accuracy for stereotactic radiotherapy of the liver in terms of reproducibility and targeting confidence.

**Method and Materials:** The study involved eight patients treated for inoperable liver metastases or hepatobiliary carcinoma. Each treatment fraction, these patients were imaged and repositioned using orthogonal portal images acquired in AP and lateral views. Repositioning occurred when the measured offset exceeded 3mm in any of the cranio-caudal (CC), anterior-posterior (AP), and medio-lateral (ML) directions. A second pair of orthogonal images assessed the residual setup accuracy. Orthogonal fluoroscopy sessions, each lasting 30 s, were acquired; some prior, but most after radiotherapy delivery. All images were acquired with the patient under active breathing control. All treatments were performed using a conventional medical linear accelerator equipped with a kilovoltage x-ray source and flat-panel detector mounted at 90 degrees from the linac beam central axis. The right diaphragm was used as a surrogate for the liver position. The reproducibility and stability of the diaphragm was thus analysed for a total of 48 fractions.

**Results:** After initial setup and repositioning, the residual setup error determined from portal images was 2.6 (CC), 3.0 (AP), and 2.6 mm (ML); conversely, the residual setup error measured from the kilovoltage fluoroscopy sessions was 3.2 (CC), 3.1 (AP), and 2.1 mm (ML).

**Conclusion:** Daily portal imaging and repositioning based on these images improves setup accuracy. Similar accuracy is shown from kilovoltage fluoroscopy analysis. On-line fluoroscopy can potentially assess patient position prior and after delivery of radiation therapy, and provide a baseline for cone-beam CT analysis.

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