AbstractID: 9190 Title: Evolution of Adrenal Gland Perfusion with Anti-Angiogenic Therapy: A CT-Based Approach

PURPOSE: In radiology it is important to understand and interpret anatomical changes which correlate with treatment plans. Several anticancer agents exist that affect tumor vasculature growth and normal vessel growth. Monitoring these effects with CT imaging may be useful to guide dosing of treatment. Observing perfusion of certain organs it possible to monitor vessel competency. If perfusion is constant over time, it can be assumed there is no significant change in vasculature, and no damage due to chemotherapeutics. In contrast, significant changes in perfusion over time may suggest a decrease in normal vessel growth as a result of therapy.

METHODS & MATERIALS: Patients receiving the vascular endothelial growth factor (VEGF) inhibitor sorafenib underwent CT imaging every six weeks, beginning with baseline studies. A "jog scan" tracked perfusion through the highly fenestrated adrenal glands. Sixteen pairs of adrenal images were contoured, with each of the sixteen scans representing different perfusion time intervals from 0-90 seconds. The mean pixel values of each gland were obtained and compared over time for any significant changes in pixel value that could indicate change in vascular perfusion over time. Further calculations were performed isolating the medullary component of the glands because of its high vascularity.

RESULTS: The average change in maximum pixel values from baseline to six weeks after treatment initiation demonstrated a 4.58% increase in peak pixel value for both adrenals, with a subsequent decrease of 3.2% in the third scan. Changes in the medullary region demonstrated a 6.1% increase in pixel value in comparison to the entire adrenal area.

CONCLUSION: Manual contouring of adrenal glands in conjunction with calculated maximum pixel values revealed changes in adrenal perfusion between baseline and therapy-monitoring CT scans. The continued monitoring of perfusion could prove beneficial to the radiologic diagnosis of significant anatomical changes as a result of chemotherapy.