**Feasibility of myocardial perfusion imaging studies in morbidly obese patients with a cadmium-zinc-telluride cardiac camera**

**BACKGROUND**: A novel cardiac SPECT camera with cadmium-zinc-telluride (CZT) based technology has a fixed array of semiconductor detectors paired with pinhole collimators focused on the heart. Image acquisition in obese patients can be challenging because of much smaller detector field of view compared to conventional gamma cameras. The aim of this study was to evaluate the impact on high body mass on the feasibility of CZT myocardial perfusion imaging (MPI). The additional aim was to investigate the mechanism of the banana-shape/obesity artifact, as referred to in literature, and to attempt of simulating it on a phantom study.

**MATERIAL AND METHODS**: Study group consisted of 43 patients with morbid obesity (BMI >= 40 kg/m2). All these patients had myocardial perfusion imaging on both CZT cardiac camera, as well as general purpose SPECT/CT gamma camera. Control group consisted of all patients who underwent myocardial perfusion imaging on CZT camera throughout one calendar year and whose BMI was lower than 40 kg/m2. In this group all repeated studies were re-analyzed for estimating the frequency of heart mispositioning in the camera field of view. The number of studies performed was 1180. A static cardiac phantom was used to simulate a banana-shape artifact. A series of phantom acquisitions during which the phantom position was altered in the camera field of view was performed.

**RESULTS**: In control group 3.7% of all cardiac scintigrams required repetition, 18.9% of which were repeated due to wrong heart positioning; median BMI in this group of patients was 36.0. Banana shape artifact was observed in one female patient with BMI 36.0. In morbid obesity group 32.6% of the studies were non-diagnostic with “truncation effect” on Scan Quality Control (QC). Median BMI in patients with diagnostic scans was 42.0 while in patients with not acceptable quality control test was 45.0 (p<0.05). Banana shape artifact was observed in 5 non-diagnostic studies. In a phantom study artifact of banana shape was obtained when gantry was distant from the phantom and target was on the edge of the camera field of view and was slightly truncated.

**CONCLUSIONS**: Problem with heart mispositioning during imaging on the CZT camera affects less than 1% of all performed studies. Morbid obesity is not a contraindication to perform myocardial perfusion scintigraphy with the use of a CZT camera because over 2/3 of the studies of very obese patients is diagnostic.

**KEY words**: obesity, BMI, myocardial perfusion imaging, CZT, cardiac camera, image artifacts