

AbstractID: 10777 Title: A video guided breath hold treatment technique for cardiac sparing breast radiotherapy

Purpose:

The purpose of this work was to examine the reproducibility of the treatment position for a breath hold treatment technique for left sided breast cardiac sparing treatments. The feasibility of three dimensional video feedback for breath hold was also examined.

Method and Materials:

Patients with left sided breast cancer and unfavorable cardiac anatomy were treated with a breath hold cardiac sparing technique. One cohort of patients was treated without any feedback and with only simple verbal instructions. Three dimensional surface images during breath hold were obtained using the AlignRT system (VisionRT, London, UK). The reproducibility of the position of the breast surface was tested by registering the surfaces to a reference image taken on the first day. The daily surfaces were also registered with the skin surface generated from the CT simulation to check for systematic setup errors. The feasibility of a video-based patient feedback system was tested using simple video goggles that interfaced with the AlignRT system. Patients were able to visualize the relationship of their current breast surface during breath hold relative to the CT-based reference surface used for treatment planning in near real time.

Results:

The variation of the breath hold surface without feedback was significant. The overall standard deviation of the breath hold surface was approximately 3-4 mm, but the range of positions of the surface was in some cases as large as 10-15 mm. Surface registration with the CT-based reference surface showed setup errors that were in some cases as large as 10 mm. Surface matching was shown to reduce the discrepancies between the daily and reference surface. Furthermore, video feedback appears promising as a method to reduce day-to-day breath hold variations.

Conclusion:

Surface imaging is a useful tool in image guided breath hold breast treatments.