Supplementary

Atlas-based auto-segmentation for delineating the heart and cardiac substructures in breast cancer radiation therapy

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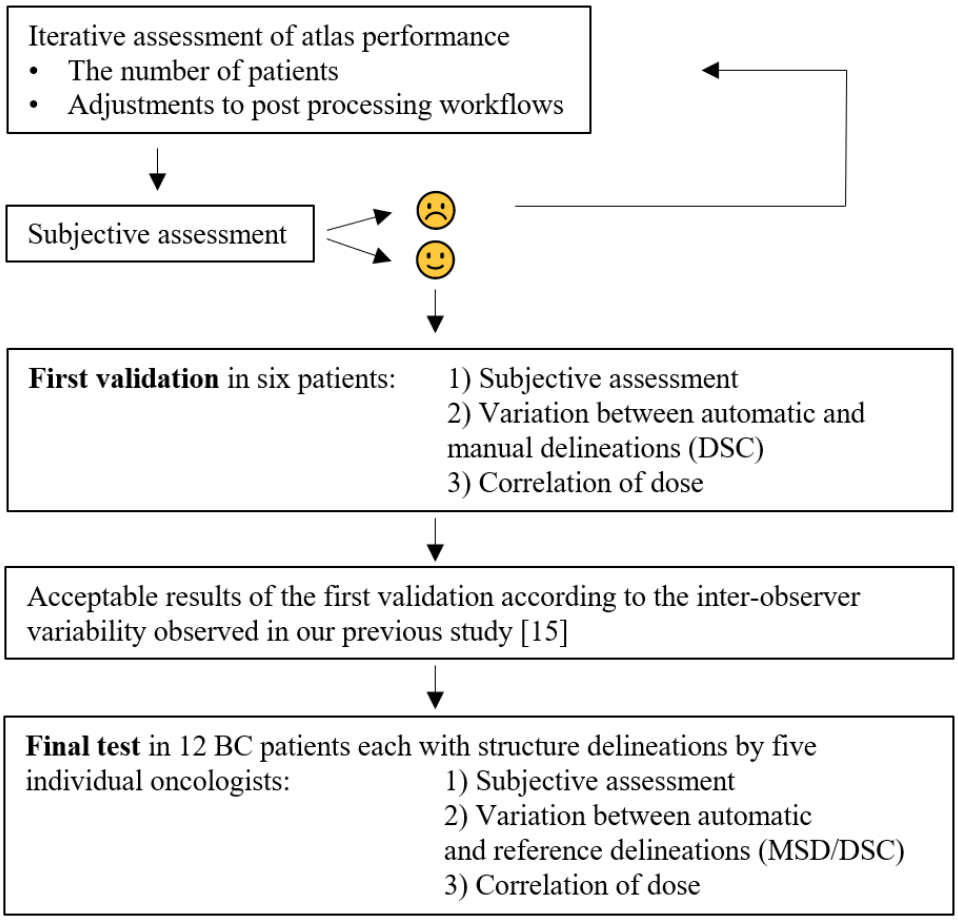
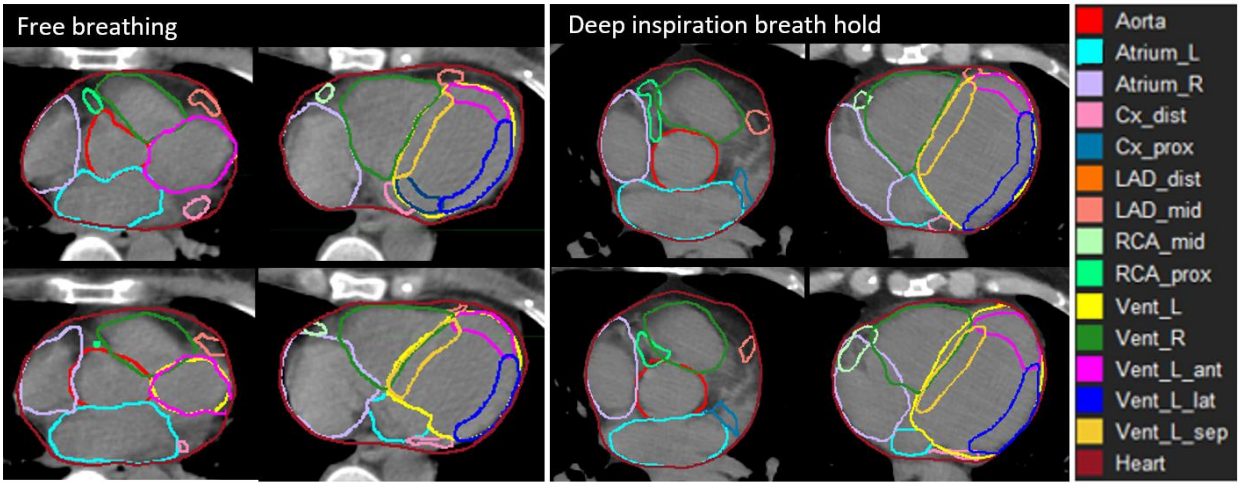
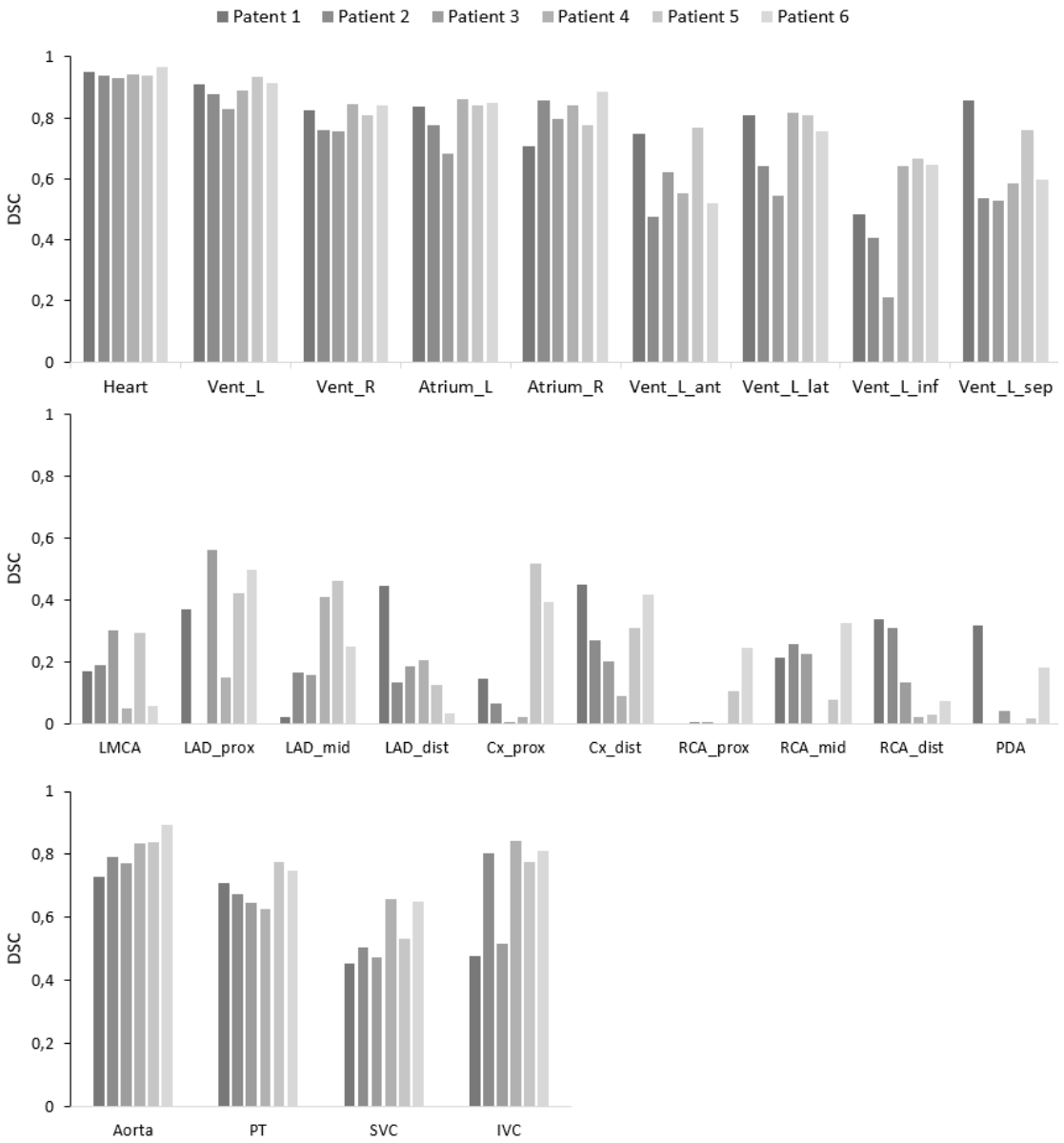


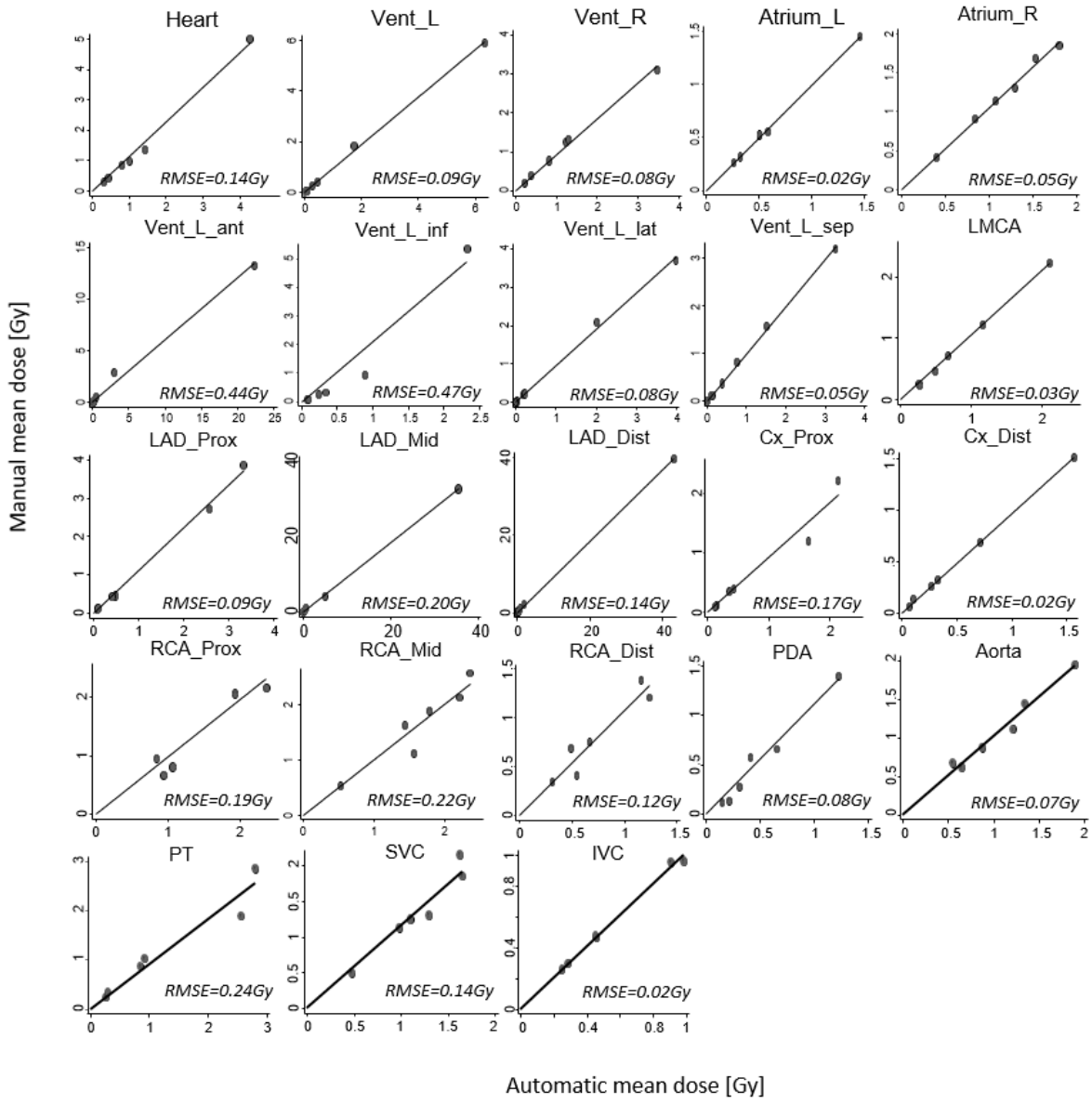
Supplementary Fig 1: The validation process of the atlas performance.



Supplementary Fig 2: In the top panel, the manual delineation of the heart, cardiac substructures and aorta are shown at two different levels of the heart for a patient scanned during free breathing and deep inspiration breath hold, respectively. The bottom panel shows the corresponding levels with the automatic delineation.



Supplementary Fig 3: The volume overlaps between the automatic and manual delineations in six patients representing the first validation of the automatic segmentation. Patient one to three was scanned under free breathing, patient four to six during deep inspiration breath hold. The Dice Similarity Coefficient (DSC) is shown for the heart, cardiac chambers and substructures of the left ventricle in the top panel, for the substructures of the coronary arteries in the middle panel and for the large vessels in the bottom panel. Abbreviations: Heart: Whole heart; Vent: Ventricle; L: Left; R: Right; Ant: Anterior; Lat: Lateral; Inf: Inferior; Sep: Septal; LMCA: Left Main Coronary Artery; LAD: Left Anterior Descending coronary artery; Cx: Circumflex coronary artery; RCA: Right Coronary Artery; PDA: Posterior Descending Artery; Prox: Proximal; Mid: Middle; Dist: Distal; PT: Pulmonary Trunk; SVC: Superior Vena Cava; IVC: Inferior Vena Cava.



Supplementary Fig 4: The correlation between RT doses in the automatic (x-axis) and the manual (y-axis) delineations for the heart and cardiac substructures in the first validation. The line is x=y (line of identity). Abbreviations: Heart: Whole heart; Vent: Ventricle; L: Left; R: Right; Ant: Anterior; Lat: Lateral; Inf: Inferior; Sep: Septal; LMCA: Left Main Coronary Artery; LAD: Left Anterior Descending coronary artery; Cx: Circumflex coronary artery; RCA: Right Coronary Artery; PDA: Posterior Descending Artery; Prox: Proximal; Mid: Middle; Dist: Distal; PT: Pulmonary Trunk; SVC: Superior Vena Cava; IVC: Inferior Vena Cava.