

Aortic Dimensions by CT versus ECHO: Some are More Equal than Others

*Vassilenko, Lubov; Blondheim, David S.; Kazatsker, Mark; Meisel, Simcha R.; Asif, Aya; Shochat, Michael; Shotan, Avraham; Zeina, Abdel-Rauf
Hillel Yaffe Medical Center, Hadera, Israel*

Background: During long-term follow-up of dilated aortas, it is common to perform CT and Echo measurements alternately to prevent excessive exposure to radiation. However, guidelines on locations and methods for measurement for both modalities differ.

Aim: To determine the relationship between measurements by CT and ECHO at various locations and using various methods.

Methods: We studied 14 patients who had a chest CT with contrast and an ECHO study. Measurements of the aorta were performed at 6 locations: aortic annulus, sinuses of Valsalva, sino-tuberal junction, 3 cm above the sino-tuberal junction, the widest area in the ascending aorta and at the aortic arch. At each location measurements were repeated using 3 techniques: internal to internal edge (INT), leading to leading edge (MIX) and external to external edge (EXT). Measurements were done on standard CT and ECHO views, readers were blinded to the other modality's results.

Results: Significant differences between modalities were found for the EXT method (mean 32.7 ± 4.3 mm by ECHO vs. 30.4 ± 4.0 mm by CT, $p < 0.0001$). Annular measurements were lower by ECHO ($p < 0.02$) and variability (by standard deviation) was largest (4.7 mm). Excluding the annulus, average differences between ECHO and CT using INT, MIX and EXT methods were: 0.2 ± 2.8 , -1.0 ± 2.7 and -2.4 ± 3.0 , respectively ($p < 0.001$ for all combinations) but their correlations were similar (0.56, 0.63, 0.60, respectively). In table are averages in mm \pm standard deviations.

*= $p < 0.03$, SIN-JUNC = mean of sinus of Valsalva and sino-atrial junction, ASC-AORTA = mean of 2 measurements in the ascending aorta.

Conclusions: There is considerable variability between the modalities. Measuring by EXT method is not advised because of significant differences between modalities. Variability is considerable within each modality for measurements of the annulus and sinuses. Difference between modalities is smallest using the INT method.