Abstract: P3730

Left atrial appendage perimeter measurement by cardiac CT is superior to transesophageal echocardiography for watchman device sizing

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Topic(s):
LAA Closure

Citation:
Background: Left atrial appendage occlusion with Watchman device traditionally relies on accurate left atrial appendage (LAA) ostium diameter measurement by 2D or 3D transesophageal echocardiogram (TEE). Alternate methods of ostium measurement including area-derived diameter and perimeter-derived diameter using cardiac computed tomography (CT) have been proposed.

Purpose: We aim to use CT technology with an advanced medical imaging application to measure LAA ostium perimeter for improved pre-procedural device sizing.

Methods: We performed a retrospective analysis of 92 patients with atrial fibrillation (Afib) who underwent Watchman implantation with pre-procedural TEE and cardiac CT between May 2015 and December 2018. LAA characteristics including ostial or landing zone perimeter, minimum and maximum diameters were acquired utilizing 3mensio Structural Heart Imaging Program. Proposed Watchman device size was estimated utilizing ostium perimeter by CT and compared to the current standard utilizing ostium diameter by 2D-TEE. Both measurements were then compared to actual implanted Watchman device size which met the P.A.S.S. criteria of position, anchor, size and seal.

Results: Watchman device sizing based on novel LAA landing zone perimeter size by CT had a very high correlation with the actual implanted Watchman size (Pearson coefficient r= 0.94, p<0.001). Traditional TEE based Watchman sizing only had a modest correlation with the implanted Watchman size (Pearson coefficient r= 0.66, p<0.001). CT predicted Watchman size had a significantly higher agreement compared to current standard TEE based sizing (93.4% vs 47.8%), inter-rater agreement was very high for CT based Watchman sizing compared to current standard TEE based sizing (Cohen’s kappa = 0.91 vs Cohen’s kappa = 0.32, p<0.001, p<0.001 respectively). Bland-Altman analysis also showed better correlation with CT based sizing compared to TEE (see Figure 1).

Conclusion: CT LAA perimeter sizing is superior to the current standard TEE based Watchman sizing. Larger, multi-center studies may be necessary to further validate our results.
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Bland-Altman analysis of CT perimeter size vs actual Watchman implant size (left) and TEE diameter size vs actual Watchman implant size (right).