**PS66.**

Carotid Artery Segmentation and Wall Thickness Measurement Using CTA

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**Objectives:** Carotid wall thickness (CWT) is important for cardiovascular risk stratification and for biomechanical modeling of carotid atherosclerotic disease. Surface ultrasound (US) is the standard means of measuring carotid intimal-medial thickness (IMT). We hypothesized that semi-automated segmentation algorithms applied to computed tomographic angiography (CTA) can accurately measure CWT.

**Methods:** Patients (n=5) with carotid disease having undergone both CTA and US were identified retrospectively. CTA DICOM images were segmented with custom algorithms utilizing active contour generation for luminal surfaces, and isoline contour detection to delineate the outer (adventitial) carotid wall and both calcified and soft plaque. CWT was computed in areas absent of plaque as the minimal distance between the luminal and adventitial walls. Six corresponding locations in the common and internal carotid in each patient were identified on duplex and wall thickness measurements taken to validate CTA results (n=30 comparisons).

**Results:** CWT by CTA ranged from 0.78 to 1.41 mm. There was 3.8% ± 2.4% absolute difference between CTA and US. The measurements correlated well with R=0.955. There was no detectable bias by Bland-Altman analysis.

**Conclusions:** CTA can be used to accurately measure CWT. 3D models of the carotid bifurcation which incorporate locally-resolved wall thickness are possible and will allow more realistic biomechanical engineering analyses.

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**PS68.**

Association between Carotid Artery Occlusion and Ultrasonographic Plaque Type: A Case Control Study

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**Objectives:** Internal carotid artery (ICA) occlusion is associated with acute stroke and carries significant morbidity and mortality. The aim of this study was to examine whether ultrasonographic carotid plaque type may be an independent risk factor for ICA occlusion.

**Methods:** During a 25-year period, 211 consecutive patients (85% males, mean age 66.01 ± 9.52) with ICA occlusion were included in this case-control study. Ultrasonographic Gray-Weale plaque type (I-V, echolucent to echogenic) characterization was obtained in both occluded and contralateral ICA. Each carotid artery with stenosis was treated as control to the occluded contralateral ICA of the same patient.

**Results:** A total of 261 carotid arteries (61.8%) were recorded with type I-II plaque type. Of the occluded ICAs 165/211 had a type I-II plaque, while 96/211 of the contralaterals (P<.001). Univariate analysis showed that carotid plaque type I-II significantly increased the risk for carotid artery occlusion (OR=4.29, 95% CI=2.81-6.57, P<.001) compared to plaque type III-IV.

**Conclusions:** Echolucent plaques are associated with increased risk of carotid artery occlusion. Carotid duplex ultrasound may help identifying the subgroup of patients with carotid stenosis that are more prone to occlusion.

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**PS70.**

Alcohol Use Patterns as an Independent Risk Factor for Symptoms in Patients with Carotid Artery Stenosis

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**Objectives:** Patterns of alcohol use have been associated with increased risk of cardiovascular events. Our lab...