CORONARY COMPUTED TOMOGRAPHIC ANGIOGRAPHY MORPHOLOGIC CHARACTERISTICS OF LIPID-CORE PLAQUES IDENTIFIED BY INTRACORONARY NEAR-INFRARED SPECTROSCOPY

i2 Oral Contributions
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Background: Although intracoronary near-infrared spectroscopy (NIRS) has been validated against histopathology to accurately detect lipid-core plaque (LCP), the morphology of such lesions has not been delineated. Coronary CT angiography (CTA) provides highly reproducible, quantitative plaque characteristics. The present study describes the CTA morphology of LCP by NIRS.

Methods: We studied patients undergoing NIRS who had previously undergone CTA within 30 days. LCP by NIRS was defined as bright yellow signal in a 2 mm segment on block chemogram (>95% specificity for LCP). All plaques seen by CTA with >25% diameter stenosis were analyzed quantitatively for plaque volume, remodeling index, and plaque attenuation; and qualitatively for features of disruption including ulceration and intra-plaque dye penetration. NIRS data was then co-registered to CTA images employing anatomic fiduciary landmarks with each vessel.

Results: 20 patients underwent both CTA and NIRS and had ≥1 LCP. LCP were characterized by CTA as large volume (mean 278 mm3), positively remodeled (85% with remodeling index >1.1), and contained considerable low-attenuation material (22% of total plaque volume). The mean diameter stenosis was 56%. The majority of LCP (60%) contained calcification. CTA evidence of plaque disruption was seen in 60% of LCP.

Conclusion: LCP lesions by NIRS have CTA morphologic features characteristic of vulnerable plaques, including large volumes, positive remodeling, and evidence of disruption.

![Figure 1: Ulcerated Low Attenuation Plaque by CTA Composed of LCP by NIRS](image-url)