

Removing Calcification Artifacts in CAD

Images courtesy of Medical University of South Carolina, Charleston.

Patients with coronary artery disease (CAD) and high vessel calcification are contraindicated for traditional computed tomography (CT) and must undergo catheter-based angiography. Photon-counting CT has the potential to change this paradigm. In this case, a patient with persisting cardiac symptoms received a stent as treatment for severe stenosis. Unfortunately, the patient’s severe degree of CAD with calcifications (Figures 1 and 3) made interpretation challenging. Often, clinicians do not perform high-resolution scans with conventional CT because of the patient radiation dose, and even with increased image resolution, calcification still masks pathologies

due to image distortion (so-called “blooming”). After using photon-counting CT (the NAEOTOM Alpha CT scanner from Siemens Healthineers and its PURE Lumen feature¹) to eliminate the calcium and its effects on image reconstruction (Figures 2 and 4), the clinicians were able to determine the underlying pathology and the degree of impaired coronary blood flow. ■

¹Pure Lumen (Vascular Calcium Removal [VCR]) can be used to measure vessel (eg, coronary) stenoses by removing the contributions of calcium from images, based on a phantom evaluation (Allmendinger et al, *Invest Radiol.* 2022;57(6):399-405).

After using photon-counting CT (the NAEOTOM Alpha CT scanner from Siemens Healthineers and its PURE Lumen feature¹) to eliminate the calcium and its effects on image reconstruction (Figures 2 and 4), the clinicians were able to determine the underlying pathology and the degree of impaired coronary blood flow.

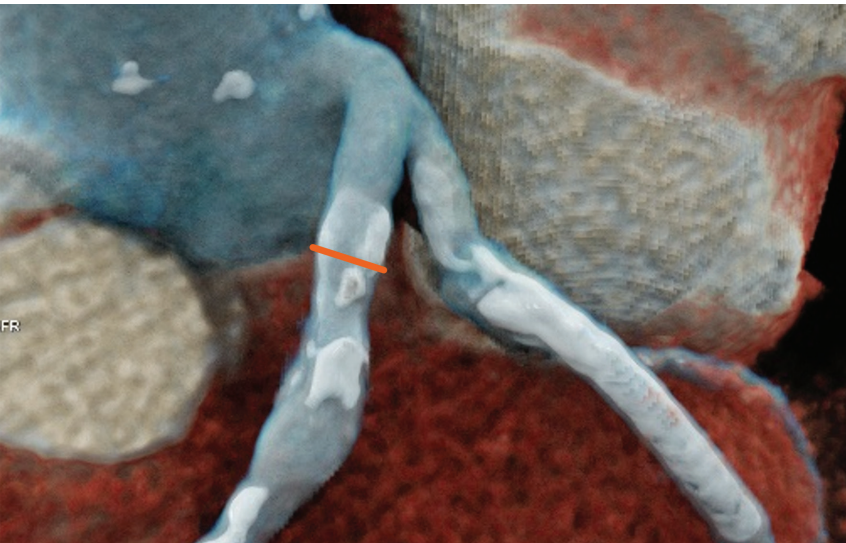


Figure 1. Cinematic rendering technique (CRT) view of heavily calcified (orange area) coronary artery.

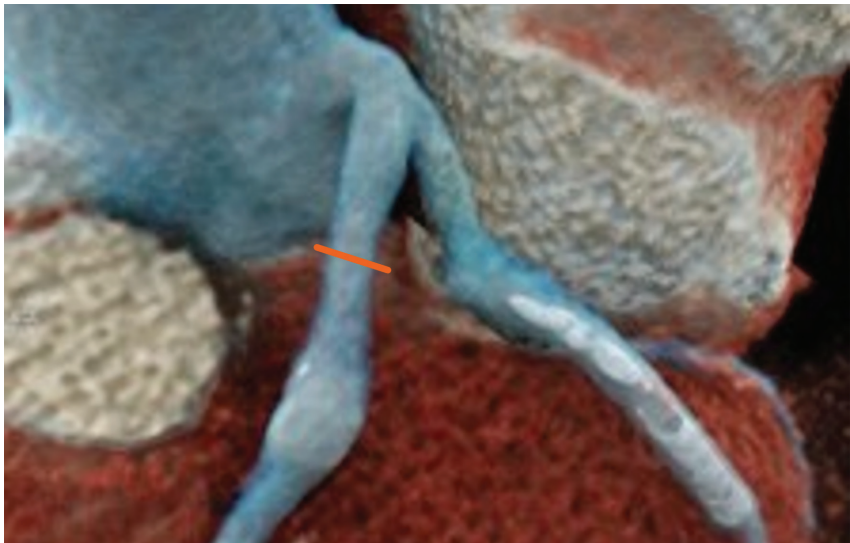


Figure 2. CRT view of coronary artery with calcium removed (orange area) via PURE Lumen.

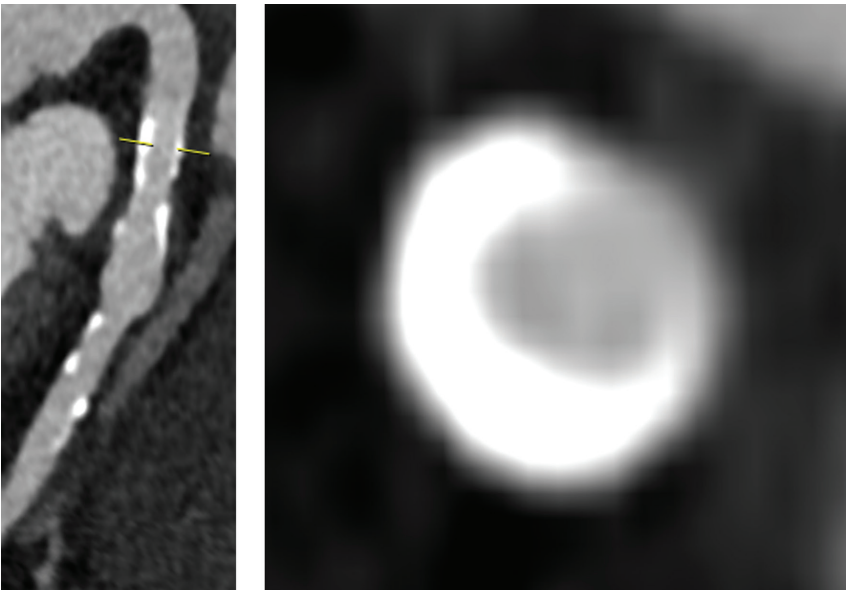


Figure 3. Curved planar reformat (CPR) and through-plane views of heavily calcified coronary artery.

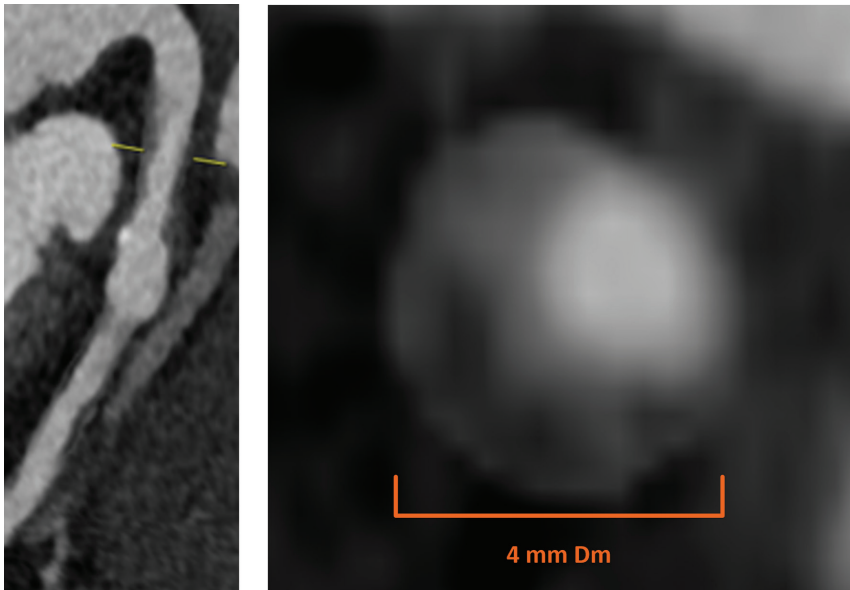


Figure 4. CPR and through-plane views of coronary artery with calcium removed via PURE Lumen.