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### SCCT Feature: CAC score only proves its value in asymptomatic patients

Within a large diagnostic population of patients with coronary artery calcium (CAC) scores of zero, 13 percent still manifest plaque of all types on cardiac CT angiography (CCTA), according to a study presented at last week's Society of Cardiovascular CT (SCCT) meeting in Orlando, Fla.

Lead author Seth Uretsky, MD, director of cardiac CT and MRI at St. Luke's and Roosevelt Hospitals in New York City, said in an interview that in real-life clinical practice, the CAC score is best applied to patients who are asymptomatic, and of low or low-intermediate risk, in order to assess if that person should be treated more aggressively.

"However, once the patients have symptoms, the amount of missed plaque on a coronary calcium scan is greater, which has previously been indicated through smaller studies," he said. "The previous literature has indicated that on average, CCTA finds plaque in about 5 percent of asymptomatic patients with a coronary calcium score of zero, whereas CCTA finds plaque in about 20 percent of symptomatic patients with a coronary calcium score of zero. Our cohort was mixed, so our data falls in the middle at 13 percent."

The researchers assessed 1,119 patients without known coronary artery disease (CAD) (51 years, 52 percent male) and a CAC score of zero during diagnostic CCTA study. They performed all CAC and CCTA studies using a 64-slice CT system (Lightspeed Volume, GE Healthcare). They assessed age, gender, CAD risk factors and the presence, morphology, location and severity of coronary plaques on CCTA.

Uretsky noted that CCTA is more effective in detecting plaques because of the use of thinner-sliced compared with thicker-sliced images in a conventional CAC scan. However, he also said that the use of contrast with CCTA makes its detection rates higher, by "giving us a greater ability to define what is and is not plaque."

As a result, Uretsky suggested that the findings would be similar with a CCTA scanner less than 64 slices. "The only trick is to have a well-performed, and the CAC scan and CCTA should ideally be performed on the same machine and on the same day."

The prevalence of coronary plaque was 13 percent (147 patients), according to the investigators. Among the 212 plaques identified in these patients, 73 percent were non-calcified, but 13 percent were calcified plaques and 14 percent were of mixed morphology. They found that the vast majority of plaques were mild, including 87 percent plaques with stenosis less than 50 percent, 11 percent with stenosis of 50-70 percent and only 2 percent with stenosis of greater than 70 percent.

Uretsky commented that most of the plaques revealed by CCTA were found in the left anterior descending artery.

The investigators found that frequency of more than 70 percent luminal diameter stenosis (i.e., about 50 percent cross-sectional narrowing) is rare in such patients. The authors concluded that the "presence of CAD risk factors does not help to predict plaque presence among patients with zero CAC scores."

Uretsky acknowledged that the study's largest limitations were its retrospective nature, and as a result, the researchers could not obtain the indications for all the patients in the study.

Of note, the researchers discovered that only four patients died in the total of 1,119 patients after two years of follow up. These four patients were among the group that initially had a CAC score of zero and no plaque detected by CCTA.

"Obviously, more research is required to fine tune these findings. However, our data suggests that while we may be missing certain patients with a CAC score of zero, which may be discovered with CCTA, in our study it didn't portend to a poor outcome," Uretsky noted. He said that he and his colleagues are going to continue to follow these patients up to four or five years.

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