Editorial Comment

A new Screening Tool for Detecting Early Atherosclerosis

Charlie W. Sheafer, Palm Spring CA, Thach Nguyen

Department of Medicine, Eisenhower Medical Center, Rancho Mirage, California 92270, USA.

In a study published in the current issue of the Journal of Geriatric Cardiology, Ang and co-investigators used the high-resolution 64-slice CT coronary angiography to detect coronary lesions in a group of patients with atypical angina. The clinical data of these patients were also used to calculate their risk according the Framingham and PROCAM scoring system. As the cohort is composed with a majority of low risk patients with atypical angina, only a small minority of the patients were classified as having medium and high risk. The results showed that MDCT uncovered 18% either significant lesions (>50% stenosis) or calcifications (>400 Agatston units) in the low risk patients and 33% in the medium and high risk subgroups.

The first question is whether the data from this 64-slice MSCT are reliable. Through the review of literature, the results from a 64-Slice MSCT were quite accurate: Leber, et al, compared 50 patients using 64-slice CT angiography and conventional coronary angiography. Sensitivity was approximately 80% and specificity greater than 90% with direct correlation. Mollet, et al, reports even higher sensitivity and specificity with an excess of 90% between the two methods, indicating that this is an acceptable alternative to conventional coronary angiography in selected patients. Fine, et al, demonstrated high sensitivity and specificity in 66 patients including 9 patients with vein grafts. They again reemphasized the significant improvement in accuracy over a 16-slice CT system. Kuetten, et al, describe 66 patients with 105 lesions and point out the significant problems with interpretation in the presence of extensive intracoronary calcification. In their experience, a calcium score of greater than 335 Agatston units precluded correct diagnosis when correlated with coronary angiography in 44% of cases.

The second question is whether the data bring anything new in the studied patient population. With an 18% significant lesion or calcification in the low risk group, the results seem to be somewhat surprising because this happened in the low risk group patients, who by history did not have symptomatic coronary artery disease nor a prior coronary event. The results in the atypical patients with intermediate to high risk level were somewhat low. However, this can be explained because the low absolute number of the study population (27 patients).

In contrast, for the high risk and symptomatic patients, in a prior publication of the same authors, a much higher incidence of 85% disease was reported.

So the most provocative data are the 18% significant lesions or calcifications in a group of patients who were classified as low risk. In any situations, under mathematical calculation, any plaque which occupies around 50% a coronary lumen is possible to crack, to rupture creating a thrombus. If the thrombus is small and transient, then the patient may present with unstable angina symptom. If the thrombus is bigger, temporarily obstructs the lumen and causes mild elevation of cardiac enzyme, the patient would present with non-Q myocardial infarction. If the fracture of the plaque results in total and persistent occlusion, then the patient would present as ST elevation myocardial infarction. These >50% plaques in low risk patients are not of low risk. They are high risk lesions. They are time bombs waiting to explode.

Follow-up information in Ang’s patient population would be of great interest. It would be interesting to know: 1) If a significant number of their patients have undergone conventional angiography, then it would be of interest to see what the degree of accuracy of MDCT is. 2) The presence of calcification in the current author’s study may affect their conclusions in that the heavy calcification group may have a different clinical course from patients with demonstrated arterial obstruction. 3) Correlative stress testing data would be interesting.

Could the discovery of asymptomatic plaques at an early stage as in this provocative study prevent future development of clinical coronary artery disease? If aggressive prevention of CAD through cholesterol lowering drug, diet, exercise etc could delay and neutralize the progression of CAD in these small and fresh plaques, then MSCT of the coronary artery will be the MOST RELIABLE SCREENING tool for all asymptomatic middle aged men and women, replacing all the risk scores calculations.

The demonstration of a significant percentage of coronary artery obstructive disease in an asymptomatic low-risk group of patients with atypical chest pain is of GREATEST interest, and further investigations confirming the above preliminary data are eagerly awaited.

References

1. Ang CK, Fong AYY, Chin SP, et al. High-resolution computed to-


