

Does Absence of Coronary Artery Calcification Exclude Obstructive Coronary Artery Disease?

In symptomatic patients, overall sensitivity of a CAC score of 0 for predicting absence of obstructive CAD was only 45%.

Evaluation of coronary artery calcium (CAC) by computed tomography (CT) has been proposed as a filter before invasive diagnostic procedures or hospital admission in symptomatic patients. This proposal is based on data suggesting that low CAC scores are associated with low risk for obstructive coronary artery disease (CAD). In a substudy of an international trial of angiographic methodologies, investigators analyzed the prevalence of obstructive CAD ($\geq 50\%$ stenosis) in 291 symptomatic patients for whom CAC scores were available (obtained ≤ 30 days before angiography). Patients with CAC scores >600 were excluded.

Overall prevalence of obstructive CAD, as identified by angiography, was 56%, and 14 of the 72 patients (19%) with CAC scores of 0 had CAD. The overall sensitivity of a CAC score of 0 for predicting absence of CAD was 45%. In a vessel-based analysis, 47 of 383 vessels (12%) without calcification had CAD, whereas 13 of 64 occluded vessels (20%) had no calcification. Revascularization was performed within 30 days of CAC scoring in 9 patients with scores of 0. The authors conclude that the absence of CAC does not exclude CAD in patients for whom clinical suspicion is high enough to prompt referral for angiography.

Comment: This study suggests that the absence of coronary artery calcification cannot exclude obstructive CAD in symptomatic people who are referred for angiography. This finding contrasts with those of prior studies and meta-analyses, in which absence of calcification was associated with low risk for CAD and for adverse cardiovascular events. Clearly, pretest probability plays a role here, as 95% of this symptomatic population was at intermediate or high risk for CAD by clinical scoring. Nonetheless, these data call into question one proposed use for CAC evaluation — as a gatekeeper to determine who, in a symptomatic population with significant clinical suspicion for CAD, undergoes angiography.

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