INTRODUCTION:

Coronary artery calcium (CAC) has been recognized to be associated with CAD on the basis of anatomic studies for decades. The development of fast CT scanners has allowed the measurement of CAC in clinical practice. CAC has been evaluated in several clinical settings. The most widely studied indication is for the use of CAC in the prediction of future risk for CAD in patients with subclinical disease, with the goal of instituting appropriate risk-reducing therapy (eg, statin treatment; lifestyle modifications) to improve outcomes. In addition, CAC has been evaluated in patients with symptoms potentially consistent with CAD, but in whom a diagnosis is unclear.

EBCT (also known as ultrafast CT) and spiral CT (or helical CT) may be used as an alternative to conventional CT scanning due to their faster throughput. Their speed of image acquisition gives them unique value for imaging of the moving heart. The rapid image acquisition time virtually eliminates motion artifact related to cardiac contraction, permitting visualization of the calcium in the epicardial coronary arteries. EBCT software permits quantification of calcium area and density, which are translated into calcium scores. Calcium scores have been investigated as a technique for detecting CAC, both as a diagnostic technique in symptomatic patients to rule out an atherosclerotic etiology of symptoms or, in asymptomatic patients, as an adjunctive method for risk stratification for CAD.

EBCT and multidetector CT were initially the primary fast CT methods for measurement of CAC. A fast CT study for CAC measurement generally takes 10 to 15 minutes and requires only a few seconds of scanning time. More recently, computed tomography angiography (CTA) has been used to assess coronary calcium. Because of the basic similarity between EBCT and CTA in measuring coronary calcium, it is expected that CTA provides similar information on coronary calcium as does EBCT. CT scan–derived coronary calcium measures have been used to evaluate coronary atherosclerosis.

Coronary calcium is present in coronary atherosclerosis, but the atherosclerosis detected may or may not be causing ischemia or symptoms. Coronary calcium measures may be correlated with the presence of critical coronary stenoses or serve as a measure of the patient’s proclivity toward atherosclerosis and future coronary disease. Thus, it could serve as a variable to be used in a risk assessment calculation for the purposes of determining appropriate preventive treatment in asymptomatic patients. Alternatively, in other clinical scenarios, it might help determine whether there is atherosclerotic etiology or component to
the presenting clinical problem in symptomatic patients, thus helping to direct further workup for the clinical problem. In this second scenario, a calcium score of zero usually indicates that the patient’s clinical problem is unlikely to be due to atherosclerosis and that other etiologies should be more strongly considered. In neither case does the test actually determine a specific diagnosis. Most clinical studies have examined the use of coronary calcium for its potential use in estimating the risk of future coronary heart disease (CHD) events.

Coronary calcium levels can be expressed in many ways. The most common method is the Agatston score, which is a weighted summed total of calcified coronary artery area observed on CT. This value can be expressed as an absolute number, commonly ranging from 0 to 400. These values can be translated into age and sex-specific percentile values. Different imaging methods and protocols will produce different values based on the specific algorithm used to create the score, but the correlation between any 2 methods appears to be high, and scores from 1 method can be translated into scores from a different method.

INDICATIONS FOR EBCT:

Quantitative coronary artery calcium scoring using electron beam computed tomography or multidetector computed tomography meets primary coverage criteria of effectiveness when:

- Performed to determine if there is too much calcium present to proceed with CT coronary angiography OR
- Performed as part of a pre-operative evaluation for orthotopic liver transplantation

NON COVERAGE:

Quantitative coronary artery calcium scoring using electron beam computed tomography or multidetector computed tomography in all other instances is a screening test. Screening tests are exclusions in most member benefit certificates of coverage except for those screening procedures required by the Patient Protection and Affordable Care Act (PPACA), those procedures required by Arkansas legislative mandates of all fully insured health policies, and specific screening coverage included in member benefit contracts (e.g., wellness benefits).
REFERENCES


Reviewed/Approved by

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