

CARDIAC IMAGING WITH DUAL SOURCE COMPUTERIZED TOMOGRAPHY

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Chest pain is the 2nd most common reason for patients to visit the emergency room. These patients number 5-8 million annually with resulting annual costs of about \$10 billion. Of these patients, only 10-15% has an acute coronary syndrome; in other words 85-90% do not have acute coronary syndrome. This 85-90% of the patients, however, undergoes lengthy and expensive observation and tests before being discharged. The conventional imaging tests cannot rule out significant coronary artery disease rapidly and non-invasively. Computerized tomography (CT) scanning for imaging coronary arteries became feasible following the introduction of helical acquisition of data and multi-detector CT (MDCT) scanners. Even MDCT scanners have been hampered by the temporal resolution needed to image the coronary arteries. One solution to the temporal resolution problem is to slow the heart with medications. However, some patients cannot be given these medications. Dual source CT enables twice the temporal resolution as against the single source CT and obviates the need to slow the heart with medications. The other impediment to widespread acceptance of CT scanning for coronary imaging has been concerns about radiation exposure. A recent innovation of the helical acquisition of data with the dual source CT scanner enables very fast acquisition of data as well as much less radiation exposure compared with earlier technology. The dual source scanner is also the first CT scanner to utilize dual energy from the two sources to characterize tissues and lesions. The ultrafast very low radiation dual source CT scanner appears to be very promising in the rapid evaluation of patients with clinical suspicion for acute coronary syndrome. The technical aspects of this scanner are presented in this seminar.