# Is Evaluation of Coronary Anatomy by CT Sufficient for CAD?
## : Lessons and Un-lessons from PROMISE

**YONG Hwanseok**

**Radiology, Korea University Guro Hospital**

Computed tomography coronary angiography (CTA) entered clinical practice around 2005, mainly due to advances in CT technology. Multi-center clinical trials using CTA demonstrated very good sensitivity and excellent negative predictive value (NPV) for the diagnosis of obstructive coronary artery disease (oCAD) compared with invasive coronary angiography. CTA has been compared with exercise electrocardiogram (ECG), using ICA as the gold standard, CTA was found to have an excellent NPV compared with exercise ECG. Cost-effectiveness studies suggest that CTA is more cost-effective than MPI in patients with stable chest pain. As a result, international societies have incorporated CTA into guidelines as a rule-out test in patients with chest pain and low to intermediate likelihood of CAD.

In an analysis of the National Cardiovascular Data Registry (NCDR), 58.4% of patients undergoing elective angiography did not have oCAD. In that subset, the largest cohort had undergone MPI, only 44.4% of patients in whom MPI studies led to cardiac catheterization had oCAD in invasive angiography. Exercise treadmill testing, stress echocardiography, and magnetic resonance imaging yielded similarly low rates of obstructive disease. In comparison, 70% of patients with CTA were found to have obstructive disease in invasive angiography, representing more than a 50% improvement in identifying patients with obstructive disease compared to any functional test. Thus, the Prospective Multicenter Imaging Study for Evaluation of chest pain (PROMISE trial) was undertaken to evaluate if this superior test performance would lead to improved outcomes. In the PROMISE trial, 10,003 patients with suspected CAD were randomized to the strategy of initial anatomic testing with the use of coronary CTA or to functional testing (exercise ECG, nuclear stress testing, or stress echocardiography). The composite primary end point was death, myocardial infarction (MI), hospitalization for unstable angina, or major procedural complication. Unfortunately, the original study design called for a minimum 2-year follow-up of the cohort, but because of budget restraints, minimum follow-up was decreased to 1 year. A second large-scale study was published simultaneously to PROMISE, called CT coronary angiography in patients with suspected angina due to coronary heart disease (SCOT-HEART). In SCOT-HEART, 4142 patients with suspected CAD were randomized to receive either only standard workup (in most cases, functional testing) or standard workup plus coronary CTA.

In this lecture, I aimed to review the clinical utility of CTA on the diagnosis, management, and outcome of patients with suspected CAD.