Coronary CT Angiography as a First-Line Diagnostic Tool for Stable Chest Pain: Clinical Outcomes from a Multicenter Study

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Coronary computed tomography angiography (CCTA) has become an increasingly important non-invasive imaging technique for evaluating patients presenting with stable chest pain. Its excellent spatial resolution and ability to visualize coronary artery anatomy have made it an essential tool for the early detection of coronary artery disease (CAD). Compared with conventional diagnostic approaches, CCTA enables rapid assessment while minimizing patient risk and improving clinical decision-making.

This multicenter prospective study assessed the diagnostic performance and clinical impact of CCTA in routine cardiovascular practice. Data from 510 patients presenting with stable chest pain across four tertiary hospitals were analyzed over an 18-month period. Coronary artery disease severity was evaluated using standardized CCTA protocols and compared with invasive coronary angiography when clinically indicated. Patient demographics, cardiovascular risk factors, plaque characteristics, stenosis severity, and subsequent clinical management were also recorded and analyzed.

CCTA demonstrated excellent diagnostic accuracy with a sensitivity of over 95% and a high negative predictive value for excluding obstructive coronary artery disease. The use of CCTA significantly reduced unnecessary invasive coronary angiography, shortened diagnostic timelines, and improved patient satisfaction through earlier diagnosis and treatment planning. Detailed plaque characterization also enabled identification of high-risk patients who benefited from aggressive preventive therapies and lifestyle interventions.

Follow-up assessments over 12 months revealed lower rates of repeat diagnostic testing and improved optimization of medical therapy among patients initially evaluated with CCTA. These findings support the continued adoption of CCTA as an effective first-line imaging modality for the assessment of stable chest pain and emphasize its growing role in precision cardiovascular medicine. Wider implementation of CCTA may contribute to improved healthcare efficiency, reduced costs, and better long-term cardiovascular outcomes.

Biography

Dr. Sophia Chen is a Senior Consultant in Cardiovascular Imaging at the National University Hospital, Singapore, with extensive experience in non-invasive cardiac imaging and advanced cardiovascular diagnostics. Her clinical expertise includes cardiac computed tomography, coronary artery disease imaging, structural heart disease assessment, and cardiovascular risk stratification. Dr. Chen has authored numerous peer-reviewed scientific publications and has contributed to several international collaborative research projects focused on cardiac CT technology and coronary imaging. She is actively involved in regional imaging education programs, mentoring cardiology trainees and conducting workshops on advanced cardiovascular imaging techniques. As a frequent invited speaker at international cardiology conferences, Dr. Chen is committed to promoting innovation in diagnostic imaging and improving patient care through the integration of emerging technologies into everyday clinical practice.