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	Diploma
Thesis Title	ROLE OF NONO-INVASIVE CT ANGIOGRAPHY IN IMPROVING RISK STRATIFICATION FOR PATIENTS WITH CORONARY ARTERY DISESES.
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Abstract	ABSTRACT

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Background: From a worldwide perspective, the rate of change in the global burden of CVD is accelerating, reflecting the changes in the low- and middle-income economies, which represent 85% of the world's population. This fact triggered a great demand for improving risk stratification for CVD (IHD on top of the list), PCI angiography being the golden standard in IHD, nevertheless, non-invasive imaging fell in trail at this target as a very attractive non-invasive alternative tool. This has yielded the rapidly growing field of non-invasive cardiac imaging using different techniques such as CCTA and MRCA among many others.

Objective: Our objective is to correlate CCTA study readings of coronary artery lesions with the concept of coronary artery remodeling, whether this remodeling is positive, negative or equivocal, in CAD (STEMI, UA and SA, STEMI was excluded from this study).

Patients & methods: We have retrieved previous CCTA studies, of which we have excluded evidence-lacking or ambiguous results, and chose the best results in 40 patients who had conventional PCI angiography within 4-10 days after CCTA. We traced the hospital records for these patients, according to which, 27 patients were diagnosed to have ACS (UA or NSTMI) and the remaining 13 had SA.

Results: We re-evaluated 40 lesions (one lesion from each patient-the most significant and most assessable) with high image quality (obtained by Toshiba Aquilione 64-slice CT machine at Ibn Al-Nafees Cardiac Center), in 27 patients with ACS and 13 patients with SA. Culprit unstable lesions in patients with ACS (n=14) had greater plaque area and a higher remodeling index (RI) - on cross section vessel analysis – than both stable lesions in patients with ACS (n=13) and in patients with SA (n=13), showing Plaque Area (PA) as follows;

(15.2 ± 2.2 mm2 VS. 7.8 ± 1.3 mm2 VS. 13.7 ± 4.8 mm2, p = 0.01; and RI (1.5 ± 0.2, 0.9 ± 0.1, 1.2 ± 0.08) p = 0.01, respectively.

Conclusion: In this study, we demonstrate (comparing to standard IVUS methodology, i.e., cross-section measurements of stenosis degree, lumen and plaque area) that CCTA can noninvasively detect differences in lesion composition and morphology between unstable lesions in patients with ACS, stable lesions in patients with ACS, and stable lesions in patients with stable angina. These data suggest that noninvasive visualization of coronary atherosclerotic plaque by CCTA might improve risk stratification of patients with suspected CAD. Initial data on the detection and characterization of coronary atherosclerotic plaque indicate that CCTA can measure plaque area, remodeling index (RI), and the degree of stenosis with good correlation to intravascular ultrasound (IVUS) and coronary angiography, respectively, in selected patients with high image quality.