The role of 2D speckle tracking echocardiography in predicting the culprit vessel in patients with non-ST segment elevation acute coronary syndrome

Thesis

Submitted for partial fulfillment for the requirements for
Master Degree in Cardiology

By

Arwa Maher El-Tabey Abd El-Aziz
M.B.B.CH

Cardiovascular medicine Department

Faculty of Medicine

Fayoum University

2024

The role of 2D speckle tracking echocardiography in predicting the culprit vessel in patients with non-ST segment elevation acute coronary syndrome

Thesis

Submitted for partial fulfillment for the requirements for
Master Degree in Cardiology

By

Arwa Maher El-Tabey Abd El-Aziz
M.B.B.CH

Under Supervision of

Prof. Khaled Ahmed Emam ElKhashab
Professor of Cardiology
Faculty of medicine - Fayoum University

Prof. Gomaa Abdelrazek Ahmed Abdelrazek
Assistant professor of Cardiology Faculty of medicine - Fayoum University

Dr. Moustafa Kamal Eldin Ibrahim Khalil
Lecturer of Cardiology
Faculty of medicine - Fayoum University

Faculty of Medicine
Fayoum University
2024

Name of the candidate: Arwa Maher El-Tabey Abd El-Aziz **Degree:** master

Title of thesis: The role of 2D speckle tracking echocardiography in predicting the culprit vessel in patients with non-ST-segment elevation acute coronary syndrome.

Supervisors:1- Prof. Dr. Khaled Ahmed Emam Elkhashab Professor of Cardiology - faculty of medicine - Fayoum university**.**

2- A.Prof. Dr. Gomaa Abdelrazek Ahmed Abdelrazek Assistant professor of Cardiology-faculty of medicine - Fayoum university**.**

3- Dr. Moustafa Kamal Eldin Ibrahim Khalil Lecturer of Cardiology-faculty of medicine - Fayoum university**.**

Department: Cardiovascular **Specialization:** Cardiovascular **Approval Date:** / /

ABSTRACT

Acute coronary syndrome is a leading cause of mortality, morbidity, and health care cost worldwide, accounting for half of all deaths due to cardiovascular disease.

However, ECG has limited ability to detect acute coronary occlusion, with a sensitivity of 70%. Hence, 30% of patients with acute coronary occlusion do not develop ST-segment elevation and are diagnosed as non-ST-elevation acute coronary syndrome.

Acute coronary occlusion is followed by rapid changes in LV systolic function that can be quantified by echocardiography. In the setting of NSTE-ACS patients, the conventional echocardiographic assessment may reveal regional myocardial wall motion abnormality of the left ventricle. however, there is absence of kinetic alteration in up to 76% of cases.

Speckle tracking echocardiography (STE) is a validated and accurate technique able to detect subtle changes in the regional left ventricular systolic function. It has also been shown to be superior to visual assessment of wall motion in detection and quantification of regional systolic function.

Consequently, this study aimed at assessing the diagnostic accuracy of 2D speckle tracking echocardiography technique using territorial longitudinal strain (TLS) for the detection of the culprit lesion in (NSTE-ACS) patients scheduled for invasive coronary angiography (ICA).

A cohort, including one hundred NSTE-ACS patients scheduled for ICA, was constructed. All patients in the cohort were subjected to thorough history, physical examination, ECG and Echocardiography. GLS and TLS parameters were obtained through 2D speckle tracking within 24 h of admission prior to ICA.

The study revealed the following:

• The predictive power of 2D-STE for LAD affection was markedly significant with 85% sensitivity, 78% specificity and 81.5% accuracy, For LCX affection was significant with 78% sensitivity, 72% specificity and 75% accuracy and for RCA affection was less significant with 67% sensitivity, 61% specificity and 64% accuracy.

• There was a significant difference in the validity of 2D STE in the prediction of culprit vessel in case of one and two-vessel disease in comparison with three vessel disease with a sensitivity of 80% and 76% respectively while the latter showed a 64% sensitivity.

• There was significant difference in TLS values among various degrees of vessel affection i.e., cases with significant stenosis and culprit vessel affection had significantly lower mean values in comparison with cases without significant stenosis.

So, based on the results of the study, the use of territorial longitudinal strain by 2D STE provides an early and accurate non-invasive method for prediction of the culprit lesion in NSTE-ACS patients undergoing ICA.