Control/Tracking Number: 24-A-12105-ACC
Activity: ACC Abstract
Current Date/Time: 10/12/2023 2:09:30 AM

SUPERIOR OF ARTERIAL PHASE FRAME COUNT IN QUANTIFYING THE RESTORATION OF CORONARY BLOOD FLOW OF THE RIGHT CORONARY ARTERY IN ACUTE CORONARY SYNDROME BY A DYNAMIC ANGIOGRAPHY AND MACHINE LEARNING ANALYSIS

Author Block: Loc Vu, Diep Tuong, Thanh Ho, Dang Nguyen, Anh Nguyen, Phú Vuong, Minh Mai, Thuan Huynh, Hien Quang Nguyen, Trang Thi Bich Le, Trien Tran, Khang Nguyen Phuc, Ngoc Thai Kieu, Le Anh Do, Tu Tran, Yen Thanh Nguyen, Thao Nguyen, Thach N. Nguyen, Tan Tao University, Long An, Viet Nam

Abstract:
Background: In percutaneous coronary intervention (PCI), the Thrombolysis in Myocardial Infarction (TIMI) Myocardial frame count (TMFC) is frequently used to estimate coronary flow and assess post-PCI restoration. However, it is dependent on the contrast injection force. Hence, how can we quantify the coronary flow in an independent, realistic situation?
Methods: Acute coronary syndrome (ACS) patients with a single lesion were selected. The control group comprised patients with non-significant coronary lesions, a normal ejection fraction, and no valvular disease. All patients underwent a dynamic angiography technique. The angiographic recording began with the injection of contrast into the coronary artery and continued with the white-colored blood moving until all the contrast had been flushed from the arteries. The review of coronary images, captured at a rate of 15 frames per second, was focused on the white-colored blood flow against a black contrast background. The arterial phase (AP) calculation started when the blood began moving and ended when all the contrast was flushed out of the distal arterial vasculature. At the same time, ML models were built based on independent datasets (200 angiogram videos). The ML program was constructed using a combination of U-net and Densenet-121. The catheter guide segmentation model and a convolutional neural network were used to detect the starting frame of AP with a complete contrast index, while the vessel segmentation model detected the ending frame of AP.
Results: The study included 30 cases (10 from the control group) with a mean age of 64.4±12 years (24 males). In the control group, the AP was 25±2.6 frames compared with 33±3.3 frames for the study group before they underwent PCI ($p<0.05$). After PCI, the AP was restored to 25.3±2.4 frames. The ML model was successfully developed with a root mean square error 5.4.
Conclusion: The AP calculated by the dynamic angiogram review technique is a potential marker for evaluating coronary flow and restoration besides the TMFC.

Category (Complete): 16. Interventional and Structural: Coronary Interventions
Clinical Implications (Complete):
*__My study will help enable cardiovascular clinicians to...__ : New technique in evaluate the restoration of coronary flow

Presentation Preference (Complete): Oral or Poster Presentation
Institution Information (Complete):
*__Responsible Institution 1:__ : Tan Tao University
*__City:__ : Long An
*__Country:__ Viet Nam
Choose a Lead Investigator: : 000003483319|Vu|Loc

Payment (Complete): Your credit card order has been processed on Thursday 12 October 2023 at 0:55 AM.
Status: Complete

Need Technical Assistance?
Contact Customer Support

American College of Cardiology
2400 N Street, NW
Washington, DC 20037

Feedback