Supplementary Figure 1

Informed consent and questionnaire

from the Affiliated Hospital of Xuzhou Medical University

Dear Participants:

We warmly invite you to participate in a research project “Comparison of diagnostic value between STE+LDDSE and CMR-FT for evaluating coronary microvascular obstruction in post-PCI patients for STEMI” approved by the ethics committee of the Affiliated Hospital of Xuzhou Medical University. This study will be conducted in the Affiliated Hospital of Xuzhou Medical University, and it is estimated that 100 subjects will voluntarily participate.

You have abundant rights to decide whether participate our study. Even if you have signed your consent to participate, you can change your decision at any stage of the study to abandon participation. No reason is needed for withdrawing from the study and we fully respect your autonomy.

Why was this study conducted?

ST-segment elevation myocardial infarction (STEMI), as a severe type of acute myocardial infarction, is an important cause of death and disability in the world. Percutaneous coronary intervention (PCI) can reduce the mortality of STEMI patients, but approximately 50% of patients experienced cardiac microvascular obstruction (CMVO) after primary PCI. CMVO is associated with poor prognosis. Therefore, it is important for STEMI patients to formulate treatment strategy and judge clinical prognosis by early detection of CMVO. Currently, late gadolinium-enhancement cardiac magnetic resonance imaging (LGE-CMR) has become a preferred method for noninvasive diagnosis of CMVO. However, the operation time in LGE-CMR is too long for many patients to

tolerate. Moreover, the gadolinium contrast agent might be detrimental to renal function, and patients with poor heart function, pacemaker implantation and claustrophobia could not be used, which limits the clinical promotion of cardiac magnetic resonance imaging (CMR) to some extent. For cardiac magnetic resonance feature-tracking (CMR-FT), myocardium contractile reserve was also evaluated by myocardial deformation calculated through the optical-flow method. However, CMR-FT might be not applicable for detecting CMVO in patients with pacemaker implantation, claustrophobia and severe heart failure. Speckle tracking echocardiography (STE) based on frame-to-frame tracking of ultrasonic speckles could be a promising technique to identify left ventricular (LV) regional function by quantifying the analysis of myocardial deformation. low-dose dobutamine stress echocardiography (LDDSE) can improve the clinical application value of STE. The the present study aimed to explore and compared the value between STE+LDDSE, and CMR-FT in detecting CMVO and find a safe, reliable, cheap, and convenient new method for detecting CMVO.

Who should not be included in the study?

If you are: I) Patients younger than 18 years old; II) Patients who are unable to perform cardiac magnetic resonance, STE and STE+LDDSE; III) Patients who cannot obtain the satisfactory images. IV) Based on safety, patients with a previous history of myocardial infarction, severe arrhythmia, coronary artery bypass grafting, shock, severe hypertension, congenital heart disease, malignant tumor, dilated cardiomyopathy, hypertrophic cardiomyopathy, and myocarditis would be excluded. V) If you feel any discomfort during the imaging procedure, the trial will be stopped immediately and you will not be included in the study.

What needs to be done if enrolled in the study?

If you are a patient with STEMI and willing to participate in this study, you will answer and fill in the following questions.

1. Gender：□Male □Female
2. Age_____（year）
3. Height_____（cm）
4. Weight_____（kg）
5. History of surgery：□No □Yes（_____years ago, term of operation：_____）
   Receiving blood products：□No □Yes
6. Smoke：□No □Yes（_____years, _____branches/day，forbid smoking for approximately _____year）
7. Drink：□No □Yes（Category □Liquor and spirits □Wine □Beer，____year, ____g/day，frobid drinking for approximately ____days）
8. Physical activity：□Normal □Restricted
9. Hypertension：□No □Unclear □Yes（Highest___/___mmHg, Lowest____/___mmHg; Feel dizzy when blood pressure up to _____mmHg，Normal blood pressure _____ mmHg）
10. Diabetes mellitus：□No □Unclear □Yes（□Drug □Insulin）
11. History of gastric or duodenal ulcers：□No □Yes
12. Dietary：□Normal □Over □Less □Unable to eat
13. History of gastric or duodenal ulcers：□No □Unclear □Yes
14. History of drug allergy：□No □Yes（Name_____）

15. History of food allergy：□No □Yes（Name_____）

16. The recent medication：□No □Yes（Name_____）

17. Menstruation：□Menstrual period □Non-menstrual period

18. Relatives (blood relationship) related diseases:-without/with _____ (name)_____）

What are the benefits of participating in the study?

Our aim is to find a convenient, inexpensive, and clinically scalable method for the detection of CMVO in acute myocardial infarction (AMI) patients after PCI.

Is there a fee to pay for participating in the study?

You are required to pay for fees for related imaging tests, and if a study related adverse reaction occurs, we will take steps to prevent it.

Do I have to take part in the study?

Participation in this study is completely voluntary and you may refuse to participate in the study, or withdraw from the study at any time during the course of the study, which will not affect your treatment by your doctor. If you decide to withdraw from this study, please contact your doctor and you may be asked for the relevant tests, which are beneficial for protecting your health.

If you believe that study damage has occurred, please contact your study doctor at the following contact number: 13056205985.

If you feel your interests are compromised, please contact the hospital ethics committee at: 0516-85806993.

Subject statement: I have read the above introduction to this study, being well informed of the risks and benefits that may result from participation in this study.

I volunteered to participate in this study. I agree ☐ decline ☐ other studies than this study utilize my medical records and specimens for pathologic examination.

Subject's signature: Date:

Subject's contact phone: Mobile phone:

Doctor states: I confirm that details of this study have been explained to the patient, in particular the risks and benefits that may result from participating in this study.

Physician's signature: Date:

Physician's working phone: Mobile phone:

Clinical trial ethics committee of Affiliated Hospital of Xuzhou Medical University contact number: 0516-85802291.

Supplementary Table 2

ICC of radial and circumferential strain.

Strain Parameters	ICC	ICC（95%）
CMR-FT		
RS	0.813	0.656 - 0.902
CS	0.941	0.885 - 0.970
STE		
RS	0.828	0.681 - 0.911
CS	0.874	0.761 - 0.935
STE+LDDSE		
RS	0.832	0.689 - 0.913
CS	0.939	0.882 - 0.969