

Reviewer #1

The authors attempted to highlight that plaque herniation or prolapse after stenting a MB segment in STEMI is a potential etiology for acute stent failure. This topic is very actual and clinically relevant.

The reviewer precisely emphasized the relevance of our case in clinical practice. We appreciate the recognition.

There are some comments and suggestions that the authors may want to address. 1) MB segment is usually observed in LAD and rare in RCA. This reviewer wonder whether MB segment was observed in RCA or not.

We agree that angiographically, MB appears more frequently in LAD. But in CCTA and autopsy series, LCx and RCA have similar involvement of MB. We have added a paragraph about MB in the discussion section with additional references as below:

“Myocardial bridging (MB) is a coronary anomaly in which a segment of epicardial coronary artery coursing under a “bridge” of overlying myocardium.(2) This phenomenon was initially discovered in autopsy. Coronary artery angiography, coronary computer tomographic angiography (CCTA) and IVUS are now commonly used imaging modalities to identify MB. In general population, the prevalence of MB reported by autopsy series was roughly 25%, similar by CCTA and lower in coronary angiography series (0.5-12%)(2). Angiographically, MB is most commonly seen in the mid segment of left anterior descending artery (LAD), followed by left circumflex (LCx) and least common in right coronary artery. However, some CCTA and autopsy series found similar involvement of LCx and RCA in MB.(3-6) The overlying myocardial fibers often lead to vessel compression during systole in cardiac cycle. Depending on the depth of MB, location of the MB, with or without myocardial hypertrophy, as well as systemic and coronary hemodynamic status, MB may result in clinical symptoms such as angina, myocardial ischemia or even ventricular arrhythmias. The first line of therapy of stable symptomatic MB remains medical treatment with beta-blockers and non-dihydropyridine calcium-channel blockers, while nitrates provides less consistent effects.”

The authors should provide the pre-IVUS image of MB segment before stenting.

We only performed IVUS after the initial stenting, but did not performed pre-stenting IVUS. We have reflected this both in “**Case presentation**” and “**Discussion**” sections in the manuscript.

2) The authors mentioned that the risk related to myocardial bridging in the STEMI culprit lesion was under-recognized. However, this reviewer thinks that IVUS study in primary PCI is an useful tool for detecting MB before stenting. Please comment about it.

The reviewer is correct. IVUS is an important imaging modality to identify and study myocardial bridging. We have revised the paragraph as below.

“IVUS is an important imaging modality to identify MB. On IVUS, the tunneled segment of coronary artery underneath the overlying myocardium demonstrates systolic vessel compression and highly specific echolucent “half-moon” appearance as shown in Figure (E, red arrows). The use of IVUS in primary PCI is a valuable technique to provide information to recognize overlying MB and plaque herniation, which can promote the consideration of approaches of prophylaxis of acute stent failure after stenting MB segment.(14,15) Empirically deploying an additional layer of stent may be advantageous after the recognition of MB and significant plaque burden and herniation in the stent on IVUS. This case further emphasizes the value of IVUS during primary PCI.”

Reviewer #2

The case report by Ma et al. presents the situation of plaque herniation after stenting the culprit lesion in a patient with STEMI and a myocardial bridge. This is a well-written, highly informative manuscript; the authors aim to raise awareness that plaque herniation or prolapse after stenting a MB segment in STEMI is a potential etiology for acute stent failure.

We fully agree with the reviewer’s precise summary of our manuscript’s aim, to raise awareness that plaque herniation or prolapse after stenting a MB segment in STEMI could be a potential etiology for acute stent failure. We appreciate the reviewer’s positive feedback.

There are only some minor issues to be corrected before publication. The editing of manuscript needs to be revised according to journal guidelines:

1. The Abstract is too short, it should be no less than 250 words. Also, it should be structured into the following sections: background, case summary, and conclusion.

By following the reviewer’s advice, we have revised the Abstract as it now reads below:

“Myocardial bridging (MB) is increasingly recognized to stimulate atherogenesis, which may contribute to an acute coronary syndrome. Stenting the coronary segment with MB has been recognized to have an increased risk of in-stent restenosis, stent fracture and coronary perforation. The safety and efficacy of stenting the culprit lesion with overlying MB in ST elevation myocardial infarction (STEMI) as primary

reperfusion therapy has not been established. We reported a patient who presented with inferior STEMI with a culprit lesion of an acute thrombotic occlusion in the right coronary artery and TIMI 0 flow. After the stent placement during primary percutaneous coronary intervention (PCI), intravascular ultrasound (IVUS) revealed myocardial bridging overlying the stented segment where heavy atherosclerotic plaque were present. Likely due to the combination of plaque herniation or prolapse caused by myocardial bridging, as well as local increased inflammation and thrombogenicity, acute stent thrombosis occurred at this region, which led to acute stent failure. The patient required an emergent repeated cardiac catheterization and placing a second layer of stent to enhance the radial strength and reduce the inter-strut space. This case highlights that a) plaque herniation or prolapse after stenting a MB segment in STEMI is a potential etiology for acute stent failure; and b) the value of IVUS to exam stent in primary PCI and recognition of overlying myocardial bridging and this potentially hazardous consequences.”

2. The Core tip is too long, it should be no more than 250 words.

By following the reviewer’s advice, we have revised the Core tip as it reads below:

“Stenting the coronary segment with myocardial bridging is associated with increased risks of in-stent restenosis, stent fracture and coronary perforation. Myocardial bridging is also increasingly recognized to be pro-atherosclerotic and potentially involve in acute coronary syndrome, including ST elevation myocardial infarction (STEMI). The safety and efficacy of stenting the culprit lesion with overlying MB in STEMI as primary reperfusion therapy has not been established. Here we present a case where plaque herniation or prolapse occurred after stenting a culprit lesion in STEMI, where overlying MB was recognized by post-stenting IVUS. The plaque herniation at the stented segment with myocardial bridging contributed to acute stent thrombosis which required a second layer of stent deployment. This case highlights that plaque herniation or plaque prolapse after stenting a MB segment in STEMI is a potential etiology for acute stent failure and the important role of IVUS in primary PCI.”

3. The Case presentation should be structured into sections: Chief complaints, History of present illness...

We understand the reviewer’s advice and understand that Case presentation is best to be structured in to sections: Chief complaints, History of Present Illness, etc as traditional case presentation. This case is somewhat unique clinically. It reports the series of events occurred during the management of a STEMI, especially the focus of the case was the recurrent symptoms due to acute stent failure and subsequent management, including imaging studies, etc. The authors felt that it might be less clear to present the case in the traditional sections. Therefore, we appears to the editors to see whether it would be acceptable in current format of presentation for publication. If the editors feel strongly and request us

to re-structure the case to above sections, we would be happy to revise the manuscript again by following the editors' instruction.

Reviewer #3

This is an interesting case report about plaque herniation after stenting induced by myocardial bridging in ST elevation myocardial infarction. This manuscript is nicely structured and well written. I have no question about this manuscript.

We appreciate the reviewer's favorable comments!

Reviewer #4

This is a very important case report study about myocardial bridging. The conclusion may be revised to include the description why IVUS study in primary PCI is a useful tool for detecting MB more detailed.

A section about IVUS study in primary PCI and potential detection of MB has been added. It is also part of the response to reviewer #1's comment (see above).