

ROUND 1

February 18, 2021

Dear Editor, *World Journal of Cardiology*

Enclosed please find our revised manuscript submission titled, “Modes of Failure and Adverse Events with Fractional Flow Reserve Guidewires: Insights from the MAUDE Database”. We appreciate the opportunity and thank the reviewer for their in-depth appraisal of our manuscript. We have addressed all concerns and believe that the manuscript is improved after incorporating the suggested changes. Below is our response to the reviewer’s comments. Thank you again for your consideration.

Waleed Tallat Kayani, MD,

Baylor College of Medicine,

1 Baylor Plaza, Houston, TX 77030, United States.

Email: waleed83@gmail.com

Rebuttal: Modes of Failure and Adverse Events with Fractional Flow Reserve Guidewires: Insights from the MAUDE Database: Manuscript Number: 61545

Reviewer # 1

1. The new finding of this manuscript is the records of errors of the devices which may help the healthcare provider to select the devices. However, this statistic could not represent the whole errors in the real world.

Response: We thank the reviewer for their comments. We agree that our findings do not represent true incidence rates and are rather proportion of the reported events. Because of lack of total number of FFR wires used during that time period (i.e., the denominator) incidence rates of complications cannot be ascertained.

2. Although the results of this manuscript showed the complications and adverse patient outcomes along with the failure of the devices, the authors needed to comment about each mode of failure of the devices related with the clinical outcome for the future awareness.

Response: In our discussion section we have categorized guidewire failures into two broad groups: structural failure and errors in signal communication. The structural failure could occur because of distal tip or shaft fracture, kinking and peeled coating. As highlighted further, structural failures are directly associated with patient harm: 53% of adverse patient events were related to fractured guidewire tips that remained in the coronary arteries. Retained guidewire fragments increase the risk of dissection, embolization, and thrombus formation and necessitate further interventions. Management options include percutaneous retrieval with a snare, surgical retrieval combined with coronary bypass, or stenting with antiplatelet therapy. The other category of guidewire failure is an error in signal communication. As highlighted in our discussion, communication errors are important to detect, as they can result in inaccurate measurements, prolonged procedures, and the need for additional instrumentation and with that the risk of associated adverse events (vessel dissection or perforation and stent dislodgement).

3. In my opinion, if the authors explore in depth about the mode of device failure of only one brand and feedback that drawback issue to the company to improve that device will be the crucial data for our health community.

Response: We thank the reviewer and completely agree with their comments. There are two important considerations: First, as reported earlier our analysis is a summary of the reports submitted to the MAUDE databases and not true incidence rates of

device failure modes or adverse events. In reality the incidence rates may be much smaller because the successful cases are not reported to the MAUDE database and there is significant underreporting as the reporting is not mandatory for all. The total number of devices used during that time period is not readily available and as such without knowing the true incidence rates our feedback may not garner a significant response. Second the total number of device failure modes were 486 [Verrata™ (Philips) n=199), Comet™ (Boston Scientific) n=180 and PressureWire™ X (Abbott) n=107]. Given there is significant variability across institutions regarding the type of FFR guidewires used, we wanted to cover the 3 most commonly utilized guidewires. Also, we wanted to capture a large number of device failures to get a better sense of common pitfalls with this technology. Nonetheless, we hope that with the publication of this paper there will be heightened awareness among operators to anticipate common issues and tackle them and the manufacturers to improve device safety and clinical outcomes. Furthermore, the FDA and manufacturers routinely monitor medical device reports submitted to the MAUDE database to identify and remedy device-related safety events in a timely manner. If the device is found to be defective, the FDA can issue safety advisories or recalls. We have added the highlighted part in our discussion (Page 5/16, Paragraph 2).

4. The attached file is my suggestion related your English.

Response: Thank you for your valuable feedback and suggestions, we have incorporated these in our paper.

ROUND 2

The revised manuscript incorporates revisions based on the comments from both the reviewers.