

Peer Review File

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Reviewer A

In this manuscript, the authors report their findings of an observational study among 195 patients undergoing right heart catheterization (RHC). The main objective was to assess the way to obtain a valid PAWP. The authors followed a systematic approach and applied clear criteria for a valid PAWP. A valid PAWP could be obtained at the first attempt in 71% of the procedures. The topic of the paper is clinically relevant. The findings are in agreement with what we also see in clinical practice. It is also good to see that it is not always possible to get blood with an oxygen saturation >88% in the wedge position. The data will not be surprising for experienced RHC operators. Still, such a systematic description can be useful. It is important to note that the findings only apply for RHC procedures through the right internal jugular vein (probably also when using a brachial vein) but might be different for a femoral access. In addition, when using smaller catheters (6 F) wires may be needed more frequently.

We appreciate the reviewer's comments. We did add in the limitation section that our findings applied when using the right internal jugular vein approach. We added the following text: "Our findings are only applicable when performing the RHC through the right internal jugular vein, using 7 or 7.5 F PAC".

Specific comments

C1- Line 187: the standard deviation for PVR is large. Was there a normal distribution?

R1- We agree with the reviewer. Normality was tested visually with Q-Q plot and by the Shapiro-Wilk test. PVR has a right skewed distribution. We have now changed the reporting of PVR to median (IQR) and tested the comparison among groups using Kruskal-Wallis test. Also associations were tested with Spearman rank correlation test. The statistical section was updated to reflect this.

C2- Line 187: it is "isolated post-capillary PH" rather than only "post-capillary PH".

R2- We agree with the reviewer and changes were made in the text.

C3- Table: the standard deviation for NT-proBNP proves that there is no normal distribution. Data have to be expressed as median (IQR), and a non-parametric test has to be used.

R3- We agree with the reviewer. Normality was tested visually with Q-Q plot and by the Shapiro-Wilk test. PVR has a right skewed distribution. We have now changed the reporting of NT-pro BNP to median (IQR) and tested the comparison among groups using Kruskal-Wallis test. Also, associations were tested with Spearman rank correlation test. The statistical section was updated to reflect this.

C4- Table 2: the correct terms for hemodynamic classification are “isolated post-capillary PH”, “combined pre- and post-capillary PH”, and “unclassified PH”.

R4- We agree with the reviewer and changes were made.

C5- SwO2: the standard deviations also suggest a skewed deviation (otherwise some patients required two attempts for a valid PAWP would have an SwO2 >100%).

R5- We agree with the reviewer. Normality was tested visually with Q-Q plot and by the Shapiro-Wilk test. PVR has a right skewed distribution. We have now changed the reporting of SwO2 to median (IQR) and tested the comparison among groups using Kruskal-Wallis test. Also associations between continuous variables were tested with Spearman rank correlation test for non-normal distributed variables. The statistical section was updated to reflect this. In addition, we tested all other continuous variables are the remaining ones have a normal distribution.

Reviewer B

C1- These authors have recorded the number of attempts needed to obtain a valid wedge pressure during a right heart catheterization in 195 patients. 39 patients required 2 attempts to obtain a valid pressure; 17 patients required three or more attempts to obtain a pressure. They also recorded the average balloon volume and the distance the catheter had been inserted into the pulmonary circulation. This study is relatively straightforward. However, the authors have recorded significant detail during this project, and this could help others evaluate their performance and outcomes during right heart catheterizations.

R1- We truly appreciate the reviewer’s comments.

C2- Also, many readers will have a reasonably good idea about a failed wedge pressure measurement, but it might be useful if the authors provided examples of abnormal waveforms, incomplete wedging, and over wedging to remind us.

R2- We agree with the reviewer’s comment, and we have now incorporated figure 1.

C3. The authors should review line 248 in the text. The second R-value is likely wrong with a misplaced decimal point.

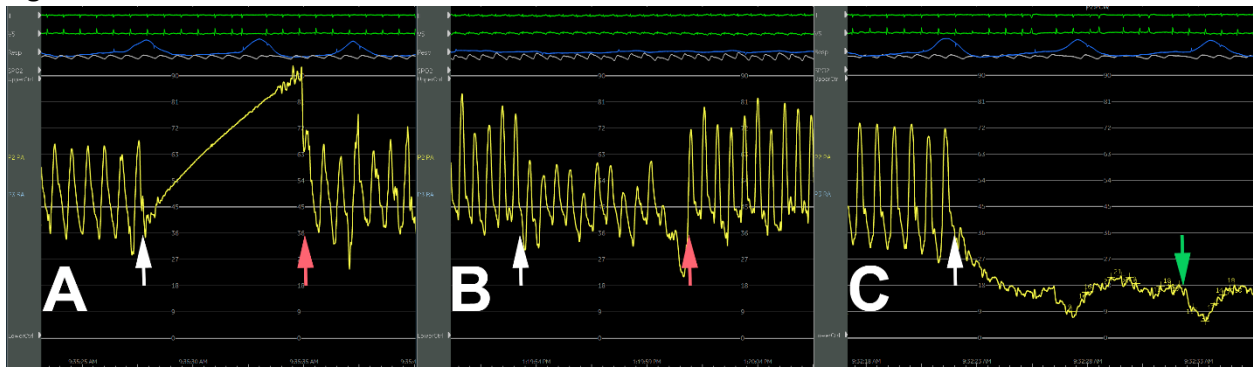
R3- The reviewer is corrected. We have now corrected this typo.

Comment 1:

C4-Reply 1: Added imaging examples of abnormal waveforms, incomplete wedging, and over-wedging.

R-4 We agree with the reviewer’s comment, and we now added the corresponding waveforms in figure 1.

Figure 1: PAWP determination



The figure shows three PAWP attempts in the same patient. The initial attempt corresponded to overwedge (panel A), with a rapid and linear increase in vascular pressure without the characteristic PAWP waveform. Therefore, the PAC was withdrawn, and a new PAWP determination attempt was performed. However, in this second determination, we noted an incomplete PAWP (panel B), with vascular pressures higher than the diastolic PAP and lacking the characteristic PAWP waveform. Hence the PAC was slightly advanced. The third attempt yielded a valid PAWP (panel C) with a vascular pressure that is lower than the diastolic PAP, while depicting characteristic waveform and the expected respiratory oscillation in vascular pressures. The white arrows pointing upwards mark the moment of PAC balloon inflation. The red arrows pointing upwards mark the time of PAC balloon deflation. The green arrow points the place for a valid PAWP determination (mid “a” wave at end-expiration). Y axis shows EKG in DII and V5, respiratory impedance, pulse oximetry and PAP determination with pressure scale lines every 9 mmHg starting from 0 mmHg.