

Peer Review File

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Reviewer A

The present submission “Effect of local warming for arterial catheterization in adult cardiac surgery: A randomized controlled trial” aimed to determine if local warming of the radial artery (RA) catheterization site could improve the success rate of catheterization.

To test this hypothesis the authors randomized 160 patients undergoing heart surgery to non-warming palpation (NP), non-warming ultrasonography-guided (NU), warming palpation (WP), and warming ultrasonography-guided (WU) groups.

While local warming increases the ID and CSA of the RA and prevent vasospasm, first pass success was not affected.

First attempt success rate for AC is pretty high. Therefore, I’m not sure if sample size is sufficient to test the hypothesis. Maybe authors can comment how sample size was calculated.

Reply) Thank you for your comment. Authors already described how to calculate the sample size. [The sample size was calculated based on previous studies. The first-attempt success rates of palpation- and ultrasonography-guided RA catheterization in adult cardiac surgery were 57.5% and 95%, respectively. We assumed that the first-attempt success rate for RA catheterization was 90% in the WU group and 60% in the NP group. Assuming a power of 0.8 with a 25% difference and two-sided alpha of 0.05, the sample size for each group was calculated as 36. Considering the attrition rate of 10%, 160 patients were recruited.]

Changes in the text: Page 7, Line 143-148.

Minor:

- Line 65 its not used for blood test but blood draws

Reply) Thank you for your comment. I changed [blood test] to [blood draws].

Changes in the text: Page 3, Line 65.

- Line 66 ff. Please be more specific. What are the systemic patient factors you are referring to? A recently published study revealed that lower weight and height are associated with reduced first time success rates PMID 36983225

Reply) Thank you for your comment. I added the systemic patient factors such as hypotension, edema, and obesity.

Changes in the text: Page 3, Line 67.

- Line 69 f. What have these resulted in eg US

Reply) Thank you for your comment. To reduce these complications caused such as bleeding, hematoma, vasospasm, dissection, and occlusion by multiple attempts of

arterial catheterization, various arterial catheterization techniques have been reported in many studies, particularly those that were guided by ultrasonography.

Changes in the text: Page 3, Line 69.

- Line 72. What poor conditions? Be more specific

Reply) Thank you for your comment. I added poor condition of arteries such as radial artery with small diameter, or tortuous pathway.

Changes in the text: Page 3, Line 72.

- Line 88. What is an inappropriate US image?

Reply) Thank you for your comment. I described an inappropriate US image which means the quality of the acquired image is very low, making it difficult to accurately identify the boundary of radial artery.

Changes in the text: Page 4, Line 88.

- Line 162 152 were analyzed

Reply) Thank you for your comment. I changed [included] to [analyzed].

Changes in the text: Page 6, Line 162.

Reviewer B

Authors study an interesting hypothesis which was well executed. It is well written. One of the major limitations which authors did mention that Anesthesiologist A (researcher) who took the images in both the groups was not blinded, which could have influenced the first pass success rate significantly as they have already localized the radial artery, even in palpation groups. This limitation should be highlighted, so future researchers will not make that mistake.

Reply) Thank you for your comment. I added the limitation about anesthesiologist A (researcher) who took the images in both the groups was not blinded. [This limitation may have affected the

273 ultrasonography assessment of the RA and its catheterization because localized RA could have influenced the first-attempt success rates significantly even in palpation groups. Therefore, it may be necessary to conduct a study in which the researcher who acquires the images of the RA, and the researcher who performs arterial catheterization are separated, and blinded.]

Changes in the text: Page 11, Line 273.

Specific comments:

P2 L 37 – An increased → The increase in

Reply) Thank you for your comment. I changed [An increased] to [The increase in].

Changes in the text: Page 2, Line 37.

P3 – What is known and what is new

Rewrite the sentence - Local warming does not increase the first attempt success rate of peripheral artery catheterization in adults undergoing cardiac surgery but increases the ID and CSA of the RA and prevents vasospasm.

Reply) Thank you for your comment. I rewrote the sentence with following sentence [Local warming does not increase the first attempt success rate of peripheral artery catheterization in adults undergoing cardiac surgery but increases the ID and CSA of the RA and prevents vasospasm.].

Changes in the text: Page 3, Line 62.

P3 L 65 – blood test → Blood draws

Reply) Thank you for your comment. I changed [blood test] to [blood draws].

Changes in the text: Page 3, Line 65.

P3 L 75 – However, there are only few studies comparing

Reply) Thank you for your comment. I corrected this sentence to [However, there are only few studies comparing].

Changes in the text: Page 3, Line 75.

P3 L 77 – We aimed to compare the influence of local warming on first pass success rate of radial artery catheterization...

Reply) Thank you for your comment. I corrected this sentence to [We aimed to compare the influence of].

Changes in the text: Page 3, Line 77.

L 88 – enrollment is misspelled.

Reply) Thank you for your comment. I corrected that.

Changes in the text: Page 3, Line 88.

L 120 – To eliminate vasodilatory effects – this sentence is confusing, please re-write . Did the authors get images before induction or after induction? Or both

Reply) Thank you for your comment. Only image of radial artery after induction was acquired.

I changed this sentence to [To exclude the vasodilatory effect caused by anesthetics,].

Changes in the text: Page 6, Line 120.

L 282 – This is a study on adult patients – authors should remove the comment in conclusion about children and effective vasodilation with local warming, which was reported from other studies. They can include in the discussion.

Reply) Thank you for your comment. I removed that sentence from conclusion, and moved it to discussion.

Changes in the text: Page 9, Line 204-205.