

Peer Review File

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Reviewer A

This is an interesting study about a common invasive exam, like coronary angiography.

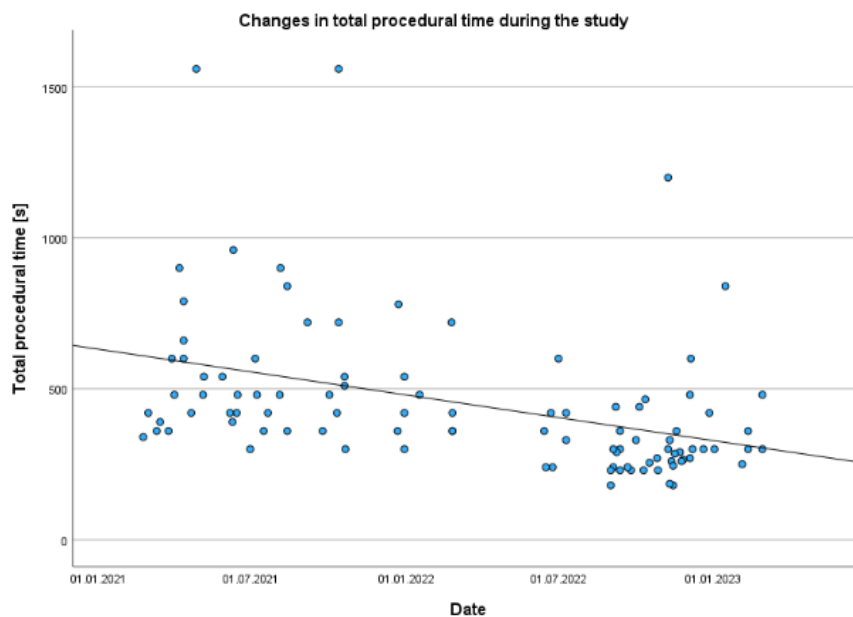
Young interventional cardiologists can start their practice with SCT, but they need to learn to use also other catheters because patient's anatomy could change.

Did you observe a difference in the duration time between the first cases and the lasts, due to the improvement of the operator's experience?

The difference in procedural performance between interventional cardiologists that learn from the beginning SCT and those who learn SCT after DCT, should be investigated.

Reply: Thank you for your comments. In the graph below you can see the changes in the total procedure time during the study with a fitted line of regression. The observed relation is significant with Pearson's correlation coefficient $r = -0.402$, $p < 0.001$ and $r^2 = 0.162$. However, due to the poor fit of the linear regression model (r^2 less than 0.5) we decided not to mention it in the manuscript.

For each of the operators, SCT was not the first contact with coronary angiography, they had previous experience of performing at least 200 self-made diagnostic procedures using standard two-catheter technique, thus it is impossible to conduct proposed investigation.



Changes in the text: Information about the experience of cardiologists performing angiographies has been added, see page 3, lines 73-75.

Reviewer B

Major:

Comment 1: Please clarify the reason did the authors compare these catheters.

I the introduction, they mentioned that “The Ultra Curve and the Trapease Curve catheters appear to be the most optimal for SCT, therefore, both were included in this study.” However, it seems speculation of the authors.

Please provide the previous data or mention about the reason.

Reply 1: Thank you for your comments. These catheters were selected, because in the previous edition of the study (Chyrchel M, Bartuś S, Dziewierz A, Legutko J, Kleczyński P, Januszek R, Gallina T, Chyrchel B, Surdacki A, Rzeszutko Ł. Safety and Efficacy of Four Different Diagnostic Catheter Curves Dedicated to One-Catheter Technique of Transradial Coronary Angiography-Pro prospective, Randomized Pilot Study. TRACT 1: Trans RADial Coronary Angiography Trial 1. J Clin Med. 2021 Oct 14;10(20):4722. doi: 10.3390/jcm10204722. PMID: 34682845; PMCID: PMC8541157.), they had better outcomes (lower rate of catheter replacement, shortest catheter dependent time, lowest total contrast volume) than the others investigated catheters. Thus, as the best, they were included in the continuation of the research (TRACT 2).

Changes in the text: A detailed description of the reason for choosing these catheters for study has been added, see page 3, lines 68-72.

Comment 2: They mentioned “less experienced young adepts of interventional cardiology”, however, this is quite unclear. The authors should clarify more details and describe the definition of the young adepts of interventional cardiology.

Reply 2: The young adepts of interventional cardiology were cardiology fellows in 3rd year of a specialization program in cardiology with previous experience in standard DCT angiography.

Changes in the text: New, more detailed description of the cardiologists performing the procedures has been added, see page 3, lines 73-75.

Comment 3: Why did they use 6F catheter in this study. In the clinical setting, 4F or 5F catheter are usually used for coronary angiography.

And interested in the reason of right radial access as well.

Reply 3: The right radial access was chosen according to the local procedure protocol. Considering the diameter of the catheter, the 6F one was chosen arbitrarily at the research design stage due to its potentially better maneuverability for beginners.

Changes in the text: None

Comment 4: The authors should mention about the evaluation for ostial stability. Which means who evaluated the 3-point scale for each coronary artery.

Reply 4: The operator who performed the angiography was responsible for evaluation of ostial stability and the rating was based on the operator's opinion.

Changes in the text: The above information was added to the text, see page 5, lines 113-114.

Comment 5: There are unclear definition of optimal and suboptimal visualization.

Reply 5: The definitions used in the study protocol were identical with the ones mentioned in the initial study [Chyrchel M, Bartuś S, Dziewierz A, Legutko J, Kleczyński P, Januszek R, Gallina T, Chyrchel B, Surdacki A, Rzeszutko Ł. Safety and Efficacy of Four Different Diagnostic Catheter Curves Dedicated to One-Catheter Technique of Transradial Coronary Angiography-Pro prospective, Randomized Pilot Study. TRACT 1: Trans RADial Coronary Angiography Trial 1. J Clin Med. 2021 Oct 14;10(20):4722. doi: 10.3390/jcm10204722. PMID: 34682845; PMCID: PMC8541157]. Therefore, 'optimal' is defined as the coaxial position of the catheter in the ostium of the coronary artery, followed by optimal filling of the artery with the contrast agent during injection. The term 'suboptimal' referred to the situation when the catheter position had to be changed due to its falling out from the coronary ostium.

Changes in the text: The definition of optimal grade has been changed to a more precise one, see page 5, lines 114-116.

Comment 6: Should mention about the they injected the contrast manually in the limitation section, because it depends on the operator.

Reply 6: This information was added to the limitation section.

Changes in the text: See pages 17, lines 312-313.

Comment 7: The authors mentioned "SCT seems to be superior to DCT in terms of ostial stability during RCA visualization" in the conclusions. Please provide the p value between Group 2 and 3 in terms of ostial stability assessment in RCA visualization in Figure 1.

Reply 7: The p value between groups 2 and 3 in terms of ostial stability assessment in RCA visualization is 0.005, while between groups 1 and 3 it was 0.345. Statistics for summed up SCT and DCT have been added to table 2 in order to change conclusion into: "SCT was associated with lower necessity of catheter exchange during RCA visualization".

Changes in the text: Inter-group p-value for ostial stability evaluation has been added to Figures 2 and 3, see pages 23, 24, lines 441, 461. New statistics were added to Table 2, see page 9, line 180. Conclusion "SCT seems to be superior to DCT in terms of ostial stability during RCA visualization" was changed to "SCT was associated with lower necessity of catheter exchange during RCA visualization", see page 2, lines 43-44 and page 17, lines 321-322.

Comment 8: The authors mentioned that the reason of a larger contrast volume was used both for LCA imaging and during the entire procedure in the TrapEase curve catheter group can be explained on the basis of the fact that the necessity to switch to another catheter was more frequently observed in group 2.

Please provide the p value between Groups 1 and 3 in terms of percentage of procedures requiring a change of catheter in Table 2.

Reply 8: In Table 2, detailed statistics comparing each of the groups and statistics comparing summed up SCT with DCT procedures have been added. These changes confirm the validity of the conclusion mentioned in the previous comment and the fact that group 2 was associated with more frequent catheter changes compared to group 1.

Changes in the text: Changes in Table 2, see page 9, line 180.

Comment 9: Please discuss the periprocedural complications, especially radial artery spasm and pain during catheter insertion. These complications might prevent by using FMD before CAG especially for the younger interventional cardiology [Ref].

Ref: Cardiovasc Revasc Med. 2023 Jun;51:38-42.

Impact of Upper Arm Prolonged Occlusion on Radial Artery Diameter Before Coronary Angiography in Patients With Coronary Artery Disease.

Reply 9: The discussion was supplemented with a fragment concerning the mentioned complications together with the suggested citation.

Changes in the text: See page 16-17, lines 297-306.

Comment 10: They mentioned “Despite the previously mentioned advantages, the transradial approach is regarded as more technically demanding than the transfemoral one and is associated with a longer procedure duration along with greater radiation exposure, particularly taking procedures provided by less-experienced operators and/or complex patient anatomy into consideration.”

Please cite the previous literatures for your comments in Page5, Line 211.

Reply: Appropriate references have been added.

Changes in the text: See page 14, line 246.

Comment 11: Please change the “age” in the Page 6, Line 255. There is no explain about “age” of the operator in the manuscript.

Reply: Information about the operator's age has been removed from the text

Changes in the text: See page 15, line 284.

Minor:

Comment 1: Please delete the “aorta” in the T4, Page3, Line 118.

Reply: The word “aorta” was deleted.

Changes in the text: See page 6, line 128.

Reviewer C

Congratulations on submitting a detailed investigation of a technique that remains hotly debated, using new trainees as a baseline for which technique is more successful.

Reply: Thank you for your comments.