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OPEN PEER REVIEW

Use of Cone-Beam Computed Tomography (CBCT) for Targeting the Portal Vein in Transjugular Intrahepatic Portosystemic Shunt (TIPS) Procedures: Comparison of Low-Dose with Standard-Dose CBCT

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About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

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Contents

1 **Original submission** Referee 1, Associate Editor, Editor-in-Chief 2
2 **Revision 1** Associate Editor, Editor-in-Chief 4
Authors' reply to reviewers 5
Reviewer and editor comments 8
3 **Revision 2** Editor-in-Chief 9
Authors' reply to reviewers 10
Reviewer and editor comments 13
4 **Revision 3** Editor-in-Chief 14
Authors' reply to reviewers 15
Reviewer and editor comments 16

1 Original submission

3 comments · 15 Dec 2020 – 28 Dec 2020

Referee 1 Reviewer

MAJOR REVISION 15 Dec 2020

Although the researchers tried to design and implement the study correctly and with high quality, there are methodological problems, as follows:
1. To validly compare two diagnostic or therapeutic methods, a randomized clinical trial should be designed and performed. Here, however, a case-control design was used, based on past data intended for patient care rather than research; therefore, there may be problems with data quality.
2. In addition, the sample sizes in the groups are unequal and small, which can negatively affect the statistical power to detect a difference between the two methods; this issue is also evident in the results of the study.
3. Since data from 2014 to 2019 were used, different personnel and individuals may have been involved in carrying out the work and collecting the data, and the accuracy and quality of their work may have differed; this also has a negative effect on the results.
4. The manuscript should be written according to the journal instructions.
5. The statistical analysis section should be written more clearly. The method used to determine normality should be stated, and the statistical test used for each purpose should be explained separately. In addition, the statistical significance level should be added, and the box plots used must also be described.
6. The titles of the tables should be written above them and should be self-explanatory.
7. For Table 2, a statistical significance column should be added.
8. In Table 3, each of the parameters within each group can be compared before and after.
9. The order of the figures is not correct, and Figure 2 was presented first. In addition, the title should indicate the type of chart, which is a box plot.

Associate Editor

MAJOR REVISION 27 Dec 2020

Dear Dr. Arne Estler,

Thank you again for submitting your manuscript to "Iranian Journal of Radiology" for peer review. It has now completed our peer-review process, and I write to inform you that we would like you to revise your manuscript.
The comments on your paper are appended to the bottom of this letter, along with a list of suggested amendments. We would like you to revise your manuscript with regard to these comments. If you are prepared to undertake the revision work required to address these concerns with your manuscript, one or more reviewers will review your revised manuscript.
In revising your work, please indicate your changes and relate them to each concern.
Thank you for your submission.
Best reagrds

Reviewer 1 #
Regarding the well-done research:
1- All arrangements and articles were good.
2-The English writing was good and acceptable.
3- The title, method and material... were well explained.
4- Only one major weakness stands out in the subject: it is obvious that a low-dose technique would result in a lower absorbed dose and lower image quality (but tolerable); it would be better to compare more low-dose

techniques and explain their costs and benefits to the readers in more detail. In this paper, only qualified engineers can fully understand your aim.
5- It is accepted after a minor revision.

Reviewer 2 #
Although the researchers tried to design and implement the study correctly and with high quality, there are methodological problems as follows:
1. To validly compare two diagnostic or therapeutic methods, a randomized clinical trial should be designed and performed; however, a case-control design was used here, based on past data intended for patient care and not for research. Therefore, there may be problems with data quality.
2. In addition, the sample sizes in the groups are unbalanced and small, which can negatively affect the statistical power to detect a difference between the two methods; this issue is also evident in the results of the study.
3. Since data from 2014 to 2019 were used, it is possible that different personnel were involved in performing the work and collecting the data, with differences in the accuracy and quality of their work; this also has a negative effect on the results.
4. The manuscript should be written according to the journal instructions.
5. The statistical analysis section should be written more clearly; the method used to determine normality should be stated, and the statistical test used for each purpose should be explained separately. In addition, the statistical significance level should be added; the box plots used must also be described.
6. The titles of the tables should be written above them and should be self-explanatory.
7. For Table 2, a statistical significance column should be added.
8. In Table 3, each of the parameters within each group can be compared before and after.
9. The order of the figures is not correct, and Figure 2 was presented first. In addition, the title should indicate the type of chart, which is a box plot.

Editor-in-Chief MAJOR REVISION 28 Dec 2020

Dear authors,
Your article needs Major Revision.
Regards

2

Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Point-by-point Reply:

Reviewers' Comments:

Reviewer 1:
Although the researchers tried to design and implement the study correctly and with high quality, but methodologically there are problems that are:

1. To validly compare two diagnostic or therapeutic methods, a randomized clinical trial study should be designed and performed; but here, a case-control design was used which is based on past data and it is intended for patient care and not for research, therefore, it can have problems in terms of data quality.

Reply by author: Thank you for this comment. Indeed the study is designed as a retrospective study as the LD-CBCT is only available since a few years.

2. In addition, the number of sample groups is unbalanced and low, which can negatively affect the statistical power and find the difference between the two methods; this issue is also evident in the results of study.

Reply by author: Thanks for this comment. We agree with the reviewer. Unfortunately, TIPS creation is not a very common procedure, which is one reason for the limited sample size. However, despite the relatively small number of patients, the difference in radiation dose between the groups reached statistical significance.

3. Since data from 2014 to 2019 were used; as a result, it is possible that different personnel and individuals are involved in the process of doing the work and collecting the data, which can differ in terms of accuracy and quality of work; this also has a negative effect on the results.

Reply by author: Thank you for this comment. Indeed variations in personal experience can not be fully excluded. However this bias is expected to be small as all TIPS implantations were performed by the same three interventional radiologists.

4. The manuscript should be written according to the journal instructions.

Reply by author: Thank you for this comment. We already tried to implement the journal´s instructions, but furthermore, we included font and size of the main manuscript, which were lacking. If you have further supplements, please let us know.

5. The statistical analysis section should be written more clearly; It should be stated what method was used to determine the normality, it should be explained separately about the statistical test used for each purpose. In addition, a statistically significant level should be added; also must be mentioned about box plots that used.

Reply by author: Thank you for this comment. The Shapiro-Wilk test was used to test for normal distribution. We have supplemented a paragraph with the appropriate information (see "Statistical analysis").

6. The titles of the tables should be written above them and should be self-explanatory.

Reply by author: Thanks for this comment. This was revised accordingly.

7. For Table 2, a statistically significant column should be added.

Reply by author: Thanks for this comment. This column was added.

8. In Table 3, each of the parameters within each group can be compared before and after.

Reply by author: Thank you for this comment. We included pre- and post-TIPS information in the sections. After TIPS the portosystemic gradient was significantly reduced in both groups. There was no difference in pressure reduction between the two groups.

9. The order of the shapes is not correct and Figure 2 was presented first. In addition, the title should indicate the type of chart that is the box plot.

Reply by author: Thanks for this comment. This was revised.

Reviewer 2:
Dear Editor in Chief
Regarding to the well done research;
1- All arrangements and articles were good.

Reply by author: Thank you for this comment.

2-English writing were nice and accepted.

Reply by author: Thank you.

3- title , method and material... were good explained .

Reply by author: Thank you for this nice comment.

4- Only one big weakness is bold in the subject: it is so obvious that low dose technique would have lower absorbed dose and lower image quality (but. tolerable); I would be better to compromise more low dose techniques and suggest to the readers cost and benefits by more details. In this paper, only qualified engineers can get the deep of your aim.

Reply by author: Thank you for this comment. We agree with the reviewer that low dose techniques should be implemented in protocols for TIPS creation as TIPS creation usually is an intervention with very high radiation dose. As such there is an urgent need to test novel techniques for lowering radiation dose. However it is very important to test if these techniques still deliver an acceptable image quality.

5- It is accepted after a miner revision.

Reply by author: Thank you very much.

2 Revision 1

2 comments · 21 Jan 2021 – 4 Jun 2021

Associate Editor

ACCEPT 21 Jan 2021

Dear Authors:
We are pleased to inform you that, following peer review, your paper has been accepted for publication.
Kind regards,

Editor-in-Chief

MINOR REVISION 4 Jun 2021

Dear authors,
Your article needs Minor Revision.
Regards

3

Revision 2

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Reviewers' Comments:

Reviewer 1:
The title of Table 4 is incorrect. Please correct it according to the text of the article.

➔ Title of Table 4 was adjusted according the comment of Reviewer 1

Associate Editor's Comments:

Associate Editor 1:
Dear Authors:
We are pleased to inform you that, following peer review, your paper has been accepted for publication.
Kind regards,

Thank you very much.

Associate Editor 2:
1-the title in word file is wrong. [lines 1 and 2] -> Thank you, this was corrected.

2-please change 3D to three dimensional for the first time. -> Thank you, this was adjusted along the proposals of the editor.

3-please add a brief background to abstract according to journal format. In addition, please add objective part to main paper based on the journal format. -> Thank you, this was added along the proposals of the editor.

4-line 9, please change 44 to Forty-four and 18 to Eighteen -> Thank you, this was adjusted along the proposals of the editor.

5-Liker is wrong. It is Likert -> Thank you, this was corrected.

6-please add full term of abbreviations for the first time in abstract and main paper separately for example; TIPS, 3D, MPR,…… -> Thank you, this was adjusted along the proposals of the editor.

7-please correct: "Neither the VVS (VVS-LD-CBCT: 2.78; VVS-SD-CBCT:2.54, p=0.467) nor the procedure time (LD-CBCT:48.3 min; SD-CBCT: 0.2 min, p=0.45) showed any statistically significant difference. -> Thank you, this was corrected.

8-line 26, SD is SD-CBCT. -> Thank you, this was adjusted along the proposals of the editor.

9-please add sequential numbers to titles and subtitles: 1-background-2-objectives-3-patients and methods-3.1- Patient selection-3.2-TIPS procedure-,……..-> Thank you, this was added along the proposals of the editor.

10-this sentence is unclear: "Contraindications to TIPS, such as hepatic encephalopathy, defined exclusion criteria." -> Thank you, this was clarified to be more understandable.

11-3-D is 3D. CB-CT is CBCT -> Thank you, this was adjusted along the proposals of the editor.

12-in line 115, please delete) after second. -> Thank you, this was deleted.

13-in line 120, SB-CBCT is SD-CBCT. -> Thank you, this was corrected.

14-in CNR formula, it is unknown what is the Mean standard deviation [SD]? SD of HU in liver? There is both mean and SD in this part and it is unclear. -> Thank you for this remark. We measured the HU in the liver in three different axial slices and determined the mean HU and SD.

15-explanations about VVS and its scores and other likert scales are better mentioned in abstract compared to the main paper [lines 13-17]. these explanations should be mentioned in main text of paper too. -> Thank you, this was added in the main manuscript along the proposals of the editor.

16-line 163, please write ver. 25 -> Thank you, this was adjusted along the proposals of the editor.

17-in line 186, is it TIPS implantation or TIPS placement? -> Tank you, we corrected it and used the term "TIPS procedure".

18-lines 204 and 205, please correct: "Mean VVS did not show any statistically significant difference (VVS LD-CBCT : 2.78±1.2; VVS SD-CBCT : 2.54±1.0, p=0.467)" -> Thank you, this was adjusted along the proposals of the editor.

19-in line 207, please correct: "……1.79±0.43 (p=0.837)." -> Thank you, this was adjusted along the proposals of the editor.

20-in lines 236 and 237 and 274 , please write LD-CBCT and SD-CBCT [instead of full term ones] [] -> Thank you, this was adjusted along the proposals of the editor.

21-in line 244, the verb excluded could be replaced by ignored. -> Thank you, this was replaced along the proposals of the editor.

22-please explain abbreviations in full term in footnote of tables. [for example CBCT, CNR, VVS] -> Thank you, these were added along the proposals of the editor.

23-the row: "Budd-Chiari-Syndrome" has been added to CHILD score part of table 2. It seems wrong. -> Thank you, this was a mistake, we changed the term to unknown CHILD score.

24-in table 3, please follow this format: Mean Procedural Time (± SD), min
And Mean DAP CBCT (± SD), µGm² . in footnote of this table, please write: Results are displayed as mean± standard deviation (SD). -> Thank you, this was adjusted along the proposals of the editor.

25-please follow journal format in references. They don't have issue number and page for papers. -> Thank you, this was adjusted along the proposals of the editor.

26-in figure 2, please correct TIPSS to TIPS. Please explain in parenthesis at the end of legend the abbreviations such as DAP, TIPS,… -> Thank you, this was added along the proposals of the editor.

27-The title of Table 4 is incorrect. it does not mention specifically what are mentioned in table. Please correct it according to the text of the article. and based on the content of table. -> Thank you, this was adjusted along the proposals of the editor.

3 Revision 2

1 comment · 14 Jun 2021

Editor-in-Chief

MINOR REVISION 14 Jun 2021

Dear authors,
Your article needs Minor Revision.
Regards

4

Revision 3

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Associate Editor's Comments:

Associate Editor 1:
1-in the tables footnote, please change CBCT abbreviation to Cone-beam Computed tomography. [all Tables 1-4]. The author has written Cone-beam Computertomography. It is better to write: “Cone-beam Computed tomography”
-> Thank you, this was adjusted along the proposals of the editor.

2-table 4 footnote, CNR is contrast to noise ratio.
-> Thank you, this was adjusted along the proposals of the editor.

3-in table 2, mean age does not have SD of age. Please add.
-> Thank you for this remark, the missing numbers were added and statistically corrected.

4-please add full term of abbreviations for the first time in main text. For example, CBCT have not been introduced in the text for the first time. [please check the paper for all abbreviations]
-> Thank you for this remark. We adjusted all abbreviations and added the full term for each of them.

4 Revision 3

1 comment · 19 Jun 2021

Editor-in-Chief

ACCEPT 19 Jun 2021

Dear authors,
Your article is acceptable for publication in IJR.
Regards