

ANSWERING REVIEWERS



June 24, 2014

Dear Editor,

Please find enclosed the edited manuscript in Word format

Title: Assessment of liver ablation using Cone Beam Computed Tomography

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Name of Journal: *World Journal of Gastroenterology*

ESPS Manuscript NO: 11039

We have taken into considerations all comments and suggestions of Editor.
The manuscript has been improved according to the suggestions of reviewer.
Online we found comments and question of Reviewer #1

1. The results demonstrated that the rate of primary effectiveness of the ablation is 100% (The minimal margin ablation of 5 mm was achieved in all cases) as well as good correlation between peri-procedural and post-procedural CT ablation volume. With this result, it seems to me that this peri-procedural ablated volume assessment by cone-beam CT might not be necessary. Because, it didn't add any changes in treatment or intervention to this selected group of patients. In addition, the technique is also added more radiation hazard and risk of intravenous contrast. One reason behind that might be the population include mostly small tumor size that could be ablated with single session. Therefore, the result does not demonstrate a good use of peri-procedural assessment of this technique (cone-beam CT).

We thank reviewer #1 for this comment. Contrast-enhanced CBCT did not lead to change of treatment in this group of patient. This may be explained by the experience of interventional radiologists and the size of the lesions. However, this does not mean that such treatment modification is not possible, only that it is not frequent. Aside from that, we agree that ablation or larger lesions are more challenging and that in this setting the usefulness of periprocedural CBCT might be more important. However, we believe that our result show interesting data on that may be used for further studies, for instance performed on larger tumors.

Regarding dose deposition the Dose Area Product (DAP) of each 3D acquisition performed on CBCT was initially stored and the mean DAP was calculated. We also recorded the radiation dose of 1-2 month post-procedural multiphasic MDCT. In order to compare the radiation dose between 3D C-arm Cone beam CT and CT, conversion factors were used to obtain effective dose estimation in milliSievert (mSv). For CT, we used the conversion factor of 0.015 mSv.mGy⁻¹.cm⁻¹) which is commonly used. The issue of patient dose in C-arm CBCT is complex). No conversion factor has been yet broadly adopted for 3D acquisitions with C-arm Cone beam CT. Mc Parland et al estimated a DAP to Effective dose coefficient for hepatic interventions of 0.16 mSv.Gy⁻¹.cm⁻². We extrapolated this result to calculate a mean effective dose.

Based on that, we found that the median DAP of 3D acquisitions performed on CBCT was 43.8 Gy.cm² (range, 21-74 Gy.cm²). The median effective dose was 7.0 mSv (range: 3.3-11.8 mSv) for CBCT. The median effective dose was 36 mSv (range, 20-52 mSv) for all MDCT phases and 14.7 mSv (range, 6-27 mSv) for one MDCT acquisition.

We have added these data to the manuscript. We have also added a short paragraph at the end of the discussion

to address this point.

2. Table 1. The author did not state the meaning of the registration time and how to interpret. It might be better if the author gives the tumor volume together with tumor size. So, we will see the relationship between tumor volume and ablation volume.

We have added the tumor size as suggested in Table 1.

We have also explained the registration time in the legend of the table

3. The author did not explain clearly why some cases demonstrated a certain volume differences between peri-procedural and post-procedural ablation seen in Fig 3b.

These discrepancies are most of the time limited. This is partially explained by the image quality, but also by the temporal evolution of the ablation area. It has been reported that ablation area may present with an initial moderate volume variation between the procedure and first tumoral evaluation between 1 and 3 months after the treatment. After that, most ablation areas show progressive volume decrease, in relation with the scarring process.

4. There are some sentences that have not been finished writing, that I highlighted below in red and underline text.

The different sentences have been corrected as suggested by Reviewer

Thank you again for considering publication of our manuscript in the *World Journal of Gastroenterology*.

Sincerely yours,

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