Reviewer's report

Title: Horizontal Ridge Reconstruction of the Anterior Maxilla using Customized Allogeneic Bone Blocks with a Minimally Invasive Technique - a Case Series

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Reviewer: Raquel Zita gomes

Reviewer's report:

In the present article entitled "Ridge reconstruction using individual customized allogeneic bone blocks with a minimally invasive technique - A case series" the authors aim to present a new, minimally invasive surgical technique for regeneration of alveolar ridge defects, consisting of preparation of bone regenerative materials/scaffolds by means of CAD/CAM technology and placement of the same scaffolds with a different surgical approach (i.e. the tunnel technique).

This work is valuable and deserves publication but there are some major issues that require clarification, before the paper can be considered for publication.

1. title. Which kind of ridge reconstruction? I think "horizontal". So please add it because I think in this paper you mainly focus on this kind of rehabilitation - not vertical. In addition, all surgeries were performed in the maxilla, no one in the mandible. The title should include this information and should be modified accordingly. "Horizontal ridge reconstruction of the anterior maxilla" would be suitable for the purpose.

2. abstract. It should be completely rewrited following the instructions below. Please provide a short background before your aim/scope, this will help to reader to understand the background. In the m&m when you talk about "restorations" you mean "implants"? or crowns? Please expand the abstract that is too short, you do not provide info on how these customized scaffolds are produced. In the results of the abstract, you do not provide any info about the clinical precision/adaptation of the scaffolds on the selected sites: please provide them. Conclusions are acceptable here.

3. keywords. Are acceptable.

4. intro. Too short. Please introduce the topic of horizontal resorption of the maxilla, this is what are you talking about (and the related aesthetic problems when placing implants). Then, you can state that autogenous bone is the goldstandard, giving pertinent references, but also autogenous bone presents drawbacks - limited availability, double surgery. Then, you can state there are other materials that we can use as alternative, including allografts
but please do not forget to properly cite xenografts and synthetic grafts as well, with proper references. This part of materials should consist of at least 1-2 paragraphs with pertinent references. Then you can state "irrespective of the material". Very interesting that you state the important goals to reach that are: "perfect adaptation of the block graft to recipient site in order to increase stability, preservation of blood supply by keeping the raised flap in good condition and maintaining edge to edge closure of the surgical site following surgery". These are important topics to discuss in the discussion. Please state that Jacotti was the first to introduce the method of customizing allografts to improve the success of regenerative bone surgery in dentistry, in a case report. Then, the aims of your paper are "describe the use of a 3D printed model to prepare a customized allogeneic bone block, and 2) to place the milled block on the defect area with a minimally invasive sub-periosteal tunneling technique to improve blood supply". Basically, you want to develop and further refine the approach described by Jacotti, in a case series that is better than a case report- please state it as it is a clear advantage of this study, there is nothing in the present literature on this topic!

5. m&m. please define the condition of horizontal deficiency of the maxilla in the enrolled patients, as inclusion criteria. Graft material: can you better explain what do you mean for "rehydratating the graft" before use? What is the purpose? I do not agree(108,681),(879,979) with you that this step render the graft less breakable and facilitate the vascular invasion. Please refer to pertinent reference if available, otherwise erase this part. Surgical procedures are clearly described, the pictures used are very clear and the 3D reconstruction, really beautiful.

6. results. No information about the clinical fit of the customized scaffolds: please add this part. No information about any intraoperative surgical complication, please add this part, if any. Please refer to the 3D reconstruction and to the augment of volume - even if i think it is not all bone, but biomaterial. Histology would be highly recommendable.

7. discussion. Before to focus on the tunnel technique and the related advantages, please shortly re-introduce a background for this study. It is not acceptable to have such a shorter discussion. I believe you really focus well on the advantages of the tunnel technique here but you should first talk about the advantages of the customization of biomaterials which are not a common thing- probably the most important aspect in this paper. So please expand the beginning of the discussion by introducing proper background. Finally, the limits of the present study should be clearly reported at the end of the discussion- limited number of patients and surgeries performed, too short follow-up time, the need to manually mill the scaffold over a bone replica (there are studies in which a milling machine is used to directly fabricate and prepare the custom made scaffolds without any manual adaptation- you cited some of them- please expand). The absence of an histologic evaluation is a limit too because we do not know if all the augmented area is really bone at 6 months- despite the beautiful 3d reconstruction, it may be all biomaterial.
8. conclusions. Please expand this section referring to your results, their limits and the need of more studies.

9. references must be expanded to 40 minimum as requested.

10. figures are beautiful.

**Are the methods appropriate and well described?**  
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**  
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**  
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**  
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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Please indicate the quality of language in the manuscript:

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