Author’s response to reviews

Title: Chest-wall reconstruction with a customized titanium-alloy prosthesis fabricated by 3D printing and rapid prototyping

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Author’s response to reviews:

Dear Reviewers,

I would like to thank all of you for taking time to critically review this manuscript, and for your acknowledgement and advices, the manuscript have been carefully edited by language professionals and additional information/clarification has been added.

Here is the point by point response:

Reviewer #1: Dear Author, the issue of the paper is very interesting and the pictures are remarkable and useful to better understand the clinical situation. However there are too much language wrongs to consider the paper for publication.

Dear Reviewer: After consulting with professional manuscript language editing services, there was indeed many mistakes, and with the help of professionals, this version has corrected/improved a lot.
Reviewer #2: Thank you to provide your experience in the treatment of the large chest wall resection with 3D printing custom made titanium prosthesis. Topic of manuscript is interesting and still stimulating argue in thoracic surgery. Nevertheless some issues should be addressed.

1) May you provide some informations about time and costs for the 3D printing process of the prosthesis?

2) May you explain the surgical plan before surgery: how do you estimate resection margins and length of the prosthesis? Do you provide for a intraoperative frozen section analysis of the tissue during surgery? do you use the implant as a template during surgery?

3) It not clear if both steel wires and screws were used for fixing the implant

4) I suggest a language revision

5) I would replace figure 5c with a more clear chest x ray

Dear Reviewer,

Thank you for taking time to critically examine our manuscript and for your constructive advices, all of the questions above have been carefully addressed.

1) This has been added to the manuscript,

“Finally, the 3D data of the prosthesis was imported into the printing device to produce the titanium-alloy prosthesis, this step usually takes 3 work days.”

“although commercially available materials are generally more cost-efficient but this is associated with risks including plate exposure, plate-screw fracture, screw loosening, infection, and poor cosmetic and functional restoration. It is also worth to point out that the cost of the custom prosthesis is not that high: $1200 for two ribs and $1300 for the sternum”

2) This has been addressed in the manuscript

i) We utilize numerous modalities of preoperative image study and 3D reconstruction to make surgical plan.

ii) We sometimes make decisions with the aid of intraoperative frozen section, but due to limitations of the frozen section itself, we cannot lean on frozen section when dealing with primary bone pathologies, but as stated in the manuscript, we also include a 2cm redundant
fixing area to accommodate the intraoperative alteration of surgical plan when designing the implants. This redundancy of fixing area greatly improves the safety of the surgery on both oncological and mechanical aspects.

iii) We do use the implant as cutting template, but as stated earlier some alterations of cutting zone is well tolerated.

3) When fixing rib prosthesis, stainless steel wire is used. When fixing sternal-rib prosthesis, screws are placed on prefabricated screw holes.

4) The manuscript have been thoroughly edited by professionals.

5) The figure has been replaced by a chest x-ray taken on POD1.

Reviewer #3: Authors report their exxperience in the use of customized titanium prosthesis fabricated by 3D printing. The paper is interesting and deals with a common and important problem in chest wall reconstruction: the availabilty of a specific prosthesis adapted to the specific defect. They report two cases with successful application of this technique reporting a lot of technical and specific data regarding the process of data acquisition, elaboration and final production, such as data regarding the physical properties. The follow up is still short however sufficient to say that it is technically easy and feasible, even if the long term results could be important. The english language need some editing for small grammatical errors, such as some abbreviations have to be better placed in the text (i.e page 4 SLA). I think the paper is well written and interesting adding new information to the current literature.

Dear Reviewer,

Thank you for taking time to critically examine our manuscript and for your constructive advices, the manuscript have been thoroughly edited by professionals and all of the questions above have been carefully addressed.

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