Peer Review File
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Reviewer A

Thank you for the invitation to review this paper.

Reply: Thank you for the time taken for your insightful review of our manuscript.

The concept of a 3D model to assist with consent has merit however the very low numbers within this paper do not allow any robust conclusions.

Reply: We agree that the low numbers are the biggest limitation of this study and have acknowledged this in our limitations section. The infrequency of complex paediatric otolaryngology surgery performed in our center by a single surgeon who adopted this technology is the main explanation for the low numbers. Nevertheless, we do believe our paper shows the feasibility and potential utility of this technology in otolaryngology, particularly for informed consent which has not been described previously in our field. Our hope is that this will fuel later studies where more robust conclusions can be made.

The graphs illustrating satisfaction outcomes do not display raw numbers - but I suspect there were just 6 responders. This results in inappropriate data visualisations.

Reply: Changes have been made to display raw numbers

Changes in the text: Figure 4. Line 384-387

The cost of the 3D model is not listed as a limitation but it clearly would be if this was to be rolled out in larger numbers.

Reply: The cost 3D models typically used in ENT varies depending on the printing technology. They typical cost of production, including engineering time to design the 3D model and the cost of production, currently ranges from AUD280 to AUD680.

Many hospitals are increasingly providing these models at the Point-Of-Care [RadioGraphics 2022; 42:451–468] and the associated costs are typically far cheaper than sourcing models for commercial third-party manufacturers.

We have added some commentary about the cost and production of these 3D models to the manuscript.

Changes in text: Cost may be a limitation on some centers to adopt this technology. Cheaper models may have limitations including single-colour and not being

sterilisatble. However, these limitations might not impact their utility as pure aids for patient informed consent. Once produced, the model can be used for clinician-to-clinician communication, surgical practice and visual reference in-theatre. Often, a model is required for one or more of these other purposes and patient informed consent is an additional use that comes at no extra cost as the model is already produced. Line 254-262

Comparing a 3D computer animation to a model may have more scientific significance and may be a way to improve the paper.

Reply: The use of 3D computer animation to aid in patient understanding would be an interesting study, although it is not something we would consider undertaking as we do not produce 3D computer animations for this purpose.

It is arguable as to whether a 3D computer animation to a model may have more "scientific significance" than a physical 3D model. Our facility has supplied (physical) patient-specific 3D models to surgeons for almost 40 years, including the first ever patient-specific anatomical model from CT data [The Journal Of Bone and Joint Surgery, 1986 68B(2), 208-212]. Compared to viewing a 3D render on a screen, the response from a clinician when holding and interacting with a physical model is profound. The responses from patients, who are mostly unfamiliar with complex anatomy, is equally compelling. There's something about being able to tangibly interact with a physical object which greatly aids in communicating (often complex) surgical plans. Hopefully our manuscript has communicated this.

Note that part of the cost of producing a 3D printed model is the design, which would be equally applicable to generating a 3D computer animation. While the cost of a 3D computer animation will be of a lower cost than a physical model, it will not be zero cost. As above, the physical 3D models typically have uses beyond patient informed consent. Uses such as surgical training (eg. instrument sizing, etc) and physically practicing on atypical anatomy are not easily achieved using 3D computer animations.

Changes in text: While the option of using a 3D computer animation without printing the models exist, there would be several reasons why animations are inferior to models. Animations do not allow a clinical to hold and physically interact with the model. Equally from a patient's perspective, interaction with a physical object greatly aids communication and complex surgical discussions. Furthermore, it is worth noting that part of the cost of producing a 3D printed model is the design, which would be equally applicable to generating a 3D computer animation. Further studies comparing animations to models may contribute to our understanding of this technology. Line 240-252

Reviewer B

Overall, I think this is a valuable and well written paper. It would benefit from the corrections and additions listed below.

- Methods: please articulate if this was a prospective or retrospective study. Give the satisfaction questionnaires are not standard of care, I assume this was prospective.

Reply: changes made as requested

Changes to text: prospective. Line 98

- Line 41 – "to agree to a healthy treatment" – should read "health treatment"

Changes to text: "health treatment" Line 64

- Line 62 "adapted" – Does the author mean "adopted"?

Changes to text "adopted" line 88

- Line 98 "3D-ptinted" – should read "3D-printed"

Changes to text: "3D-printed" line 125

- Line 132-140 – some comment should be made that further statistical analysis was not attempted due to low case numbers, justifying the limited statistics presented.

Reply: changes made as requested

Changes in text: "Further statistical analysis was not attempted due to low case numbers" Line 175-176

- 156-158 – "3D printing was historically first used as a training tool for placement of tracheobronchial stents" – the paper quoted was from 2019. 3D printing temporal bones was used in in paediatric operative planning well before 2019. Can the author please check the validity of this statement?

Reply: This is for paediatric otolaryngology not for ENT in general. Additionally the original paper was from 2013, the quoted paper was referencing the original paper. Changes have been made to the references.

Changes to text: reference change. Line 199

Pre-operative simulation of pediatric mastoid surgery with 3D-printed temporal bone models *Int J Pediatr Otorhinolaryngol.*2015 Mar 10. pii: S0165-5876(15)00115-9.

- Discussion: Though there is good elucidation of positive factors, it would be important for the author to also presents negatives of 3D printed models for routine cases - ie financial cost to the health care system and time delays to surgical care. The author could then use this as a rational for recommendations for when this technology should be utilised, as compared to when it would be redundant or not cost-effective

Reply:
Many hospitals are increasingly providing these models at the Point-Of-Care [RadioGraphics 2022; 42:451–468] and the associated costs are typically far cheaper than sourcing models for commercial third-party manufacturers. Producing the models at the Point-Of-Care also has the added benefit of facilitating the rapid production and delivery of the model, which can be ready as rapidly as the day after the request. Our facility has even produced a model that was requested while surgery was underway. Nevertheless, we acknowledge it may be a limitation to some centres and have made changes as requested.

We have also highlighted potential issues with cost as raised by reviewer 1.

Changes to manuscript: line 264-268