

Three-Dimensional Planning in Maxillofacial Surgery



One of the finest advances in the Oral and Maxillofacial Surgery (OMFS) is the increased utilisation of three-dimensional (3D) models for planning and simulating surgical interventions. There are several types of printers and materials used for clinics. With more adaptation, the decreased cost of printers and allied materials and the increasing demand for precision and accuracy for better results accelerated the need for 3D printing in Maxillofacial Surgery.^[1] With such a 3D model utilisation, it has been reported that the surgery time is reduced by up to 20% with a documented decrease in failure rate.^[2] A study by Jacek Banaszewsk *et al.* performed a case-control type of study for surgical reconstruction of the mandible, and the functional and aesthetic results were greater in the group that utilised 3D models.^[2] A pooled data analysis that pooled data from 297 articles from 35 countries comprising 2889 patients studied the utilisation pattern of 3D printing in surgery. They observed that dental implantology and mandibular reconstruction are the two most common procedures, for which 3D models were sought. The form was a surgical guide for the former and an anatomical guide for mock surgery for the latter. From these studies, they could identify that reduction of surgical time and better precision were the advantages while the increased cost and time taken were the disadvantages posed.^[3] It was also observed that Chinese OMFS utilised the technique more than others and 45% of all cases were done by professionals. Interestingly, the remaining 55% were done by amateurs. This trend is a welcome one where more work is done by amateurs rather than professionals. The interesting features are that there is less regulation for the technology and usage. As these entities such as anatomical models are still not recognised as medical devices, they are not regulated by appropriate authorities.^[4] Without appropriate regulations, the use of non-standard, cheap devices could lead to disastrous outcomes and unnecessary outcomes. In cases where the surgical plates and critical-sized defects are printed, precision and biocompatibility become crucial. Till meaningful guidelines

are implemented by authorities, the profession must evolve a uniform good manufacturing and good clinical practice for 3D models, surgical guides and other crucial parts.

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REFERENCES

1. Meglioli M, Naveau A, Macaluso GM, Catros S. 3D printed bone models in oral and cranio-maxillofacial surgery: A systematic review. *3D Print Med* 2020;6:30.
2. Jacek B, Maciej P, Tomasz P, Agata B, Wiesław K, Radosław W, *et al.* 3D printed models in mandibular reconstruction with bony free flaps. *J Mater Sci Mater Med* 2018;29:23.
3. Alodadi A. Utilizing three-dimensional printing in treating challenged dental implant cases. *World J Dent* 2018;9:235-41.
4. Louvrier A, Marty P, Barrabé A, Euvrard E, Chatelain B, Weber E, *et al.* How useful is 3D printing in maxillofacial surgery? *J Stomatol Oral Maxillofac Surg* 2017;118:206-12.

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