

SSG07-03

Scientific Papers

Application of 3D Printing in Face Transplantation

Tuesday, 10:50 - 11:00 AM

Location: S402AB

— Award: Trainee Research Prize - Fellow

PARTICIPANTS:

Amir Imanzadeh MD (Presenter): Nothing to Disclose
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CITE THIS ABSTRACT

CONCLUSION

Based on this data, 3D printing is now a mandatory step in surgical planning for face transplantation and it is very likely to be implemented in the other VCA and complex surgeries in the near future.

Background

The role of 3D printing in surgical planning has been assessed in some studies; however, to date there is only sparse data to assess clinical impact. Vascular CTA is performed for surgical planning before face transplantation, a large scale Vascularized Composite Allotransplantation (VCA). The purpose of this study is to assess the clinical impact of 3D printing in face transplantation.

Evaluation

This study was approved by the institutional human research committee. Four face transplantation patients from a single, large, urban teaching hospital prospectively underwent pre-procedure 320 x 0.5 mm detector row CT (Aquilion One, CITY, Japan) with 3D visualization (Vitreia, Vital Images, Minnetonka, MN, USA). For 3D printing, DICOM images were segmented and processed using customized software (Mimics, Materialise, Leuven, Belgium) and the STL files were created. The models were printed subsequently (SLA 7000, 3D Systems, Rock Hill, SC) from the STL outputs. The clinical impact of the 3D models was assessed by consensus between one senior surgeon and one senior radiologist.

Discussion

3D printed models provide superior pre-operative data for face transplantation surgical planning when compared to 2D visualization. Complex anatomy and bony defects from either injury, prior surgeries, or both was better appreciated with 3D models. It was felt that the total procedure

time was reduced with the prospective use of 30 models.