#EA21: Use of 3D Printing and Virtual Reality in Anaesthesia
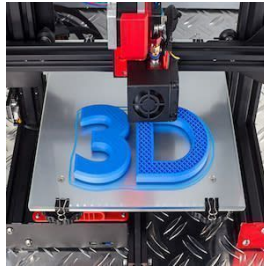

Research presented at Euroanaesthesia 2021 suggests that using 3D printing and virtual reality can improve patient care and reduce equipment wastage and anesthesiologist stress.

The research was presented by a team from the Tel Aviv Sourasky Medical Center in Israel. During the presentation, they reported the use of 3D technology to prepare for operations in 20 patients. Most of the patients involved in the study involved children undergoing lung surgery.

The team used imaging scans to print accurate models of patient airways on which to plan the procedures. The ability to see, hold and rotate a precise replica of the patient's airway provided clinicians' information on the most appropriate airway equipment.

The researchers report that a 3D model can be made in only 30 minutes, and a single print can be turned around in 3-4 hours. 3D printing is not a new technology in healthcare and is already used in other specialties such as orthopaedic surgery, paediatric cardiology and dentistry. However, so far, the use of 3D printing and virtual reality is quite limited in anaesthesia.

Image Credit: Euroanaesthesia 2021

The Tel Aviv Medical Center has been using 3D printing and virtual reality modelling since 2019 to assess patients before surgery who had a potentially difficult airway and children requiring one-lung ventilation so surgery could be performed on the other lung.

During this study, the researchers reviewed 20 patients referred for 3D modelling. 3D printing was used for airway cases (15 patients) with virtual reality for large mediastinal masses (MM) cases (3 patients).

Findings show that when 3D printing was used, the airway plan practiced on the 3D model ended up being the final airway plan in 87% of the patients. In one case, the model plan was more conservative, and in another case, the model could not be made because of poor imaging scans. None of the MM patients needed invasive procedures before being anaesthetised. No anaesthetic complications were reported in the patients who were referred for 3D modelling.

Overall, the researchers report that with 3D printing, there is less trauma to the patient, trial and error are reduced, and there is less wastage of equipment. Moreover, the anaesthesiologists involved in these cases reported less stress, and there was a greater understanding of the challenges involved for each patient. Finally, sharing these 3D models with patients provided them with a deeper understanding of their surgery and helped improve communication. The researchers believe that 3D printing has significant potential even though it is still underutilised for pre-operative planning in anaesthesia.

Source: Euroanaesthesia 2021

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