Manufacturing splints for orthognathic surgery using a three-dimensional printer.

OBJECTIVE: A new technique for producing splints for orthognathic surgery using a 3D printer is presented. STUDY DESIGN: After 3-dimensional (3D) data acquisition by computerized tomography (CT) or cone-beam computerized tomography (CBCT) from patients with orthognathic deformations, it is possible to perform virtual repositioning of the jaws. To reduce artifacts, plaster models were scanned either simultaneously with the patient during the 3D data acquisition or separately using a surface scanner. Importing and combining these data into the preoperative planning situation allows the transformation of the planned repositioning and the ideal occlusion. Setting a virtual splint between the tooth rows makes it possible to encode the repositioning. After performing a boolean operation, tooth impressions are subtracted from the virtual splint. The “definitive” splint is then printed out by a 3D printer. CONCLUSION: The presented technique combines the advantages of conventional plaster models, precise virtual 3D planning, and the possibility of transforming the acquired information into a dental splint.
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