

## Digital Dentistry

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### Abbreviations

CAD/CAM: Computer-Assisted Design/Computer-Assisted Manufacturing; CBCT: Cone-Beam Computerized Tomography

Some years ago, the idea of having a fully integrated digital dentistry was not in dentists minds. The traditional way how things were made, for example: Using hydrocolloids or silicon-based materials to obtain dental molds and gypsum to obtain the dental casts, methods with a high possibility of alterations and deformations, specifically due humidity and non-ideal storage conditions; Transfer the facial bow to the articulator, with error already established in the literature [1], specially related to anatomical variations in the portion when comparing right and left sides, for example, among other procedures.

Since the 90s, a lot of effort was made to develop systems that were capable to digitalize dentistry and enhance precision and pre-visibility in the prosthodontics and restorative dentistry area. The utilization of CAD/CAM systems represented an important milestone to achieve accuracy and exactness, especially on refined tooth preparations combined with stabilized protocols. For periodontics, the combination between high resolution CBCT (Cone-beam computerized tomography) scans and 3d printing allowed perio-implant surgeons to design gingivectomy and implant guides [2].

In my area, Oral and maxillofacial surgery, specifically in orthognathic surgery, it was only in 1999 when Okumura and collaborators [3], first publish the combination between the best tools available so far, surface scanner and digital cephalograms, to simulate a single-jaw setback mandibular procedure without using any advanced imagiological exams. Subsequently, the development of new software and equipment in conjunction with long-term longitudinal studies evaluating the precision and accuracy enable more and more surgeons to use this type of technology.

Once the digital planning was possible, the next challenge was to materialize the planning and transfer it into the surgical field. With the advent of 3d printers, today it is easy and possible to replicate what was designed and planned in the computer screen with high predictability and accuracy [4].

Recently, with the progress of metal 3d-printing, using sintering technology, it was possible to advance one step forward, introducing the concept of waterless orthognathic surgery [5], where no tooth-borne splint and trans operative maxillo-mandibular fixation is necessary, using only cutting and drilling guides and custom-made titanium plates, that are already bended using the patient's anatomy as reference. This methodology seems to be more precise and reliable when compared to all traditional methods [6].

Every day we see evolution in the digital dentistry area, regarding new technologies, materials and protocols and we need to be update to provide the best solutions for our patients, regardless of specialty.

## Bibliography

1. Zizelmann C., *et al.* "An Evaluation of Face-Bow Transfer for the Planning of Orthognathic Surgery". *YJOMS* 70.8 (2012): 1944-1950.
2. Harris BT, *et al.* "Creation of a 3-dimensional virtual dental patient for computer-guided surgery and CAD-CAM interim complete removable and fixed dental prostheses : A clinical report". *Journal of Prosthetic Dentistry* 117.2 (2017): 197-204.
3. Okumura H., *et al.* "Three-dimensional virtual imaging of facial skeleton and dental morphologic condition for treatment planning in orthognathic". *American Journal of Orthodontics and Dentofacial Orthopedics* 116.2 (1999): 126-131.
4. Schouman T, *et al.* "Accuracy evaluation of CAD / CAM generated splints in orthognathic surgery : a cadaveric study". *Head Face Medicine* (2015): 1-9.
5. Philippe B. "Custom-made prefabricated titanium miniplates in Le Fort I osteotomies : principles , procedure and clinical insights". *International Journal of Oral and Maxillofacial Surgery* 42.8 (2013): 1001-1006.
6. Stokbro K., *et al.* "Patient-specific Printed Plates Improve Surgical Accuracy in Vitro". *Journal of Oral and Maxillofacial Surgery* (2018).

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