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Editorial

3D Models, where are we Going?

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Dental casts are very important for diagnosing and treatment planning, as well as for teaching and researching. Over the years, 2D models (conventional) have been used with accuracy and as a tool capable of protecting the dentist in past and future situations. 2D models are used in many dental specialties as gold standard for dental researches. However, these models can break, have storage problems, and at long term, their cost increases significantly. Furthermore, 2D models can be difficult to obtain because they demand an impression with materials having satisfactory stability up to the dental plaster pouring; or due to limited mouth opening that impairs the impression procedure; or due to excess of saliva [1], which may not impair the procedure but make it difficult. These challenges lead to the development of alternative methods for the morphological evaluation of the anatomic structures. The three-dimensional analysis of the dental arches is a significant shift in the collection of data [2] by generating digital models through intraoral scanning (and also extraoral scanning through the digitization of the conventional models) that may be saved and visualized at three-dimensions on the computer screen. And do not stop there. 3D digital photographs, holographs, sterophotogrammetry, 3D computed tomography have also been employed, revealing a one-way path.

Thus, 3D models have a key role in dentistry because advantages, as: rotation and handling similar to conventional models [3], accurate measurements, more adequate handling and storage, online sharing of the information among different centers that allows the evaluation, planning, and execution of different treatment phases [4]. Studies comparing the measurements on digital and conventional models concluded that the 3D models are clinically acceptable and reproducible [5]. This technology provides 3D optical, electro-mechanical, electromagnetic scanners that may be used directly on dental impressions and models to obtain the metric coordinates of the reference points.

Through conventional models (2D), one can diagnose changes in the growth of the craniofacial complex by analyzing the transversal, anterior-posterior [6], and vertical [7] tooth relationships. On 3D models, besides all those measurements, the volume and area can be measured, emphasizing that this tool enables further studies on the dimensions of the dental arches easier than on 2D models [8]. This latest information can improve clinical practice and researches.

To sum up, 3D world is already part of the dentistry routine, although it seems far from the routine of clinical practices. 3D technology has been shown in clinical research papers and has been a trend inside the University that already stores data through this. Thus, this tendency cannot be avoided, and it is up to us, professors and researches, introducing this innovative technology to be a routine to provide easiness, progress, information, and knowledge to those using 3D technology.

Bibliography

1. Zhang F., *et al*. "Validity of Intraoral Scans Compared with Plaster Models: An In-Vivo Comparison of Dental Measurements and 3D Surface Analysis". *PLoS One* 11.6 (2016): e0157713.

2. Sforza C., *et al*. "Evaluation of a 3D stereophotogrammetric technique to measure the stone casts of patients with unilateral cleft lip and palate". *Cleft Palate Craniofacial Journal* 49.4 (2012): 477-483.

3. Bootvong K., *et al*. "Virtual model analysis as an alternative approach to plaster model analysis: reliability and validity". *European Journal Orthodontics* 32.5 (2010): 589-595.

4. Kuijpers MAR., *et al*. "Three-dimensional Imaging Methods for Quantitative Analysis of Facial Soft Tissues and Skeletal Morphology in Patients with Orofacial Clefts: A Systematic Review". *PLoS One* 9.4 (2014): e93442.

5. Leifert MF., *et al*. "Comparison of space analysis evaluations with digital models and plaster dental casts". *American Journal of Orthodontics and Dentofacial Orthopedics* 136.1 (2009): 16.e1-4.

6. Sinko K., *et al*. "The GOSLON yardstick in patients with unilateral cleft lip and palate: review of a Vienna sample". *The Cleft Palate Craniofacial Journal* 45.1 (2008): 87-92.

7. Lilja J., *et al*. "Analysis of dental arch relationships in Swedish unilateral cleft lip and palate subjects: 20-year longitudinal consecutive series treated with delayed hard palate closure". *The Cleft Palate Craniofacial Journal* 43.5 (2006): 606-611.

8. Ma X., *et al*. "Digital Three-Dimensional Automation of the Modified Huddart and Bodenham Scoring System for Patients With Cleft Lip and Palate". *The Cleft Palate Craniofacial Journal* 54.4 (2016): 481-486.

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