

# DIGITALLY EMPOWERED ESTHETIC DENTISTRY “FUNCTIONALLY AND BIOLOGICALLY DRIVEN DIGITAL SMILE DESIGN”

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## INTRODUCTION

The evolution of digital dentistry has resulted in improvements in esthetic standards, beauty, and dental harmony, with the objective of enhancing clinical performance through digital simulations (1).

Digital Smile Design (DSD) is a powerful diagnostic tool that could improve treatment analysis, result predictability, professional patient management, and multidisciplinary communication between specialists (1, 2).

A proper treatment strategy is based mainly on the harmony of white (teeth) and pink (gingiva) esthetics. Therefore, a multidisciplinary approach using digital dentistry is essential for an accurate esthetic diagnosis and to attain an adequate treatment plan in order to achieve satisfactory results and restore oral health pragmatically and conservatively (3).

## METHODOLOGY

A female patient of 27 years reported to the Department of Prosthodontics, Faculty of Dentistry, University of Alexandria with the chief complaint of bad esthetics of the anterior teeth. On Clinical examination patient had multiple discolored old anterior composite restorations leading to an unsatisfied smile and was planned to receive esthetic rehabilitation (Figure 1).



Figure (1): Smile close-up view

The digital models were attached to the virtual articulator using facebow oriented maxillary cast on a semi adjustable analogue articulator (Bioart A7 Plus). Protrusive and lateral angles were transferred to the virtual articulator on Exocad dental software based on its analogue equivalent. After that, all the mandibular movements necessary to create an occlusally harmonized prosthesis could be simulated by the virtual articulator (Figure 2).

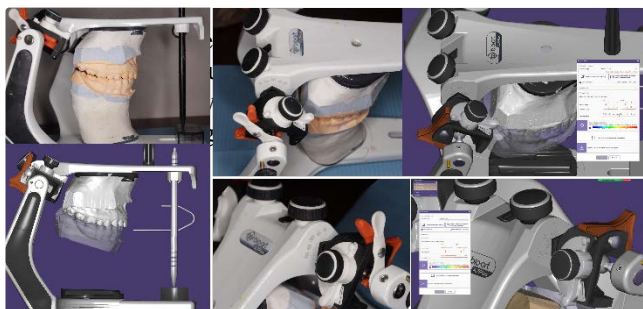
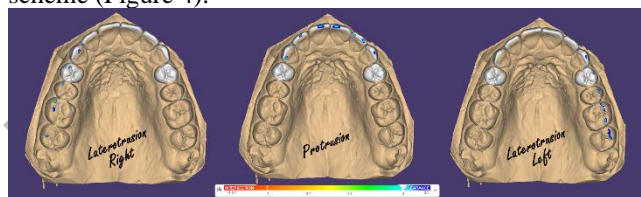


Figure (2): Mounting and records transfer to the virtual articulator  
Smiling and retracted dental photographs were recorded then used for the digital smile design using Exocad dental software (Figure 3).



Figure (3): Digital smile design using Exocad dental software

The occlusion of the restorations was adjusted digitally to keep the patient with a group function occlusal scheme (Figure 4).



The extent of gingival recontouring while respecting biological width was estimated by DSD in accordance with CBCT analysis. A 3D printed wax-up model was fabricated to perform a motivational mock-up (Figure 5).



The designed prosthesis was 3d printed using a castable resin to transform the virtual design to reality. It was then 3D printed in a dental laboratory for occlusal contacts and harmony before being pressed into a lithium disilicate fixed restoration. (Figure 6).



Figure (6): Final esthetic restorations from designing to production

Accurate fit of the fixed prosthesis in its place with acceptable contacts, esthetics, occlusion and recontoured healthy gingiva.

## CONCLUSION

The predictability of esthetic rehabilitation along with biological and functional essentials could be improved by digital dentistry.

## REFERENCES

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