Prosthetic Management Of A Partially Edentulous Patient With Rhein 83 Semi-Precision Attachment & Digital Smile Designing (DSD) Concept For Esthetic And Functional Correction – A Case Report

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Abstract

As ageing is an accepted fact with a high concentration of geriatric patients, awareness about the tremendous need for removable prosthodontic services is also paramount. While the basic process of making dentures has changed little over the past several decades, new materials and techniques can help laboratories and clinicians provide functional, esthetic restorations that offer exceptional value to patients. This case report will show how Digital Smile Designing can help integrate perfect esthetics with the science of function.

Introduction

Dental esthetics in dentistry, is the theory and philosophy that deals with beauty and the beautiful, especially with respect to the appearance of a dental restoration, as achieved through its form or color. Those subjective and objective elements and principles underlying the beauty and attractiveness of an object, design and principle1. Even the Dental esthetics has a direct relationship with golden proportion - The width of central incisor is in golden proportion to the width of the lateral incisor. Width of the lateral incisor to width of canine is also in golden proportion, as is the width of canine to first premolar2. Frush & Fischer3 also introduced the SPA factor describing esthetics based on patient’s Sex, Personality & Age. But today we have moved to the concept of Digital Smile Design (DSD) as given by Christian Coachman used for treatment planning and conceptualizing the science of esthetic dentistry.

Case Report

A 78 year old lady came to our clinic with the chief complaint of missing teeth wanting its replacement for eating food and to look presentable (Fig.1). Patient was asked about dental history, she was advised extraction of most of her teeth due to dental caries following which she had pain for an extended duration of time and was therefore reluctant to get further dental treatment.

She was then advised by her general physician to make dentures and start chewing food (instead of swallowing) for nourishment. She had been on dialysis for the past 7 years and complains of occasional water retention in her feet. Her general physician refused to give consent for implant surgery, so it was decided to proceed with upper and lower cast partial dentures with Rhein 83 attachment for the upper denture with incorporation of Digital Smile Design (DSD) principles for giving her optimum esthetics with function.

On intra oral examination, it was found that there is adequate inter-arch distance with bony projections and root stumps present in the lower arch (Fig. 2). Patient was advised crown lengthening of the upper left lateral incisor for matching the gingival zeniths but was refused by the patient. She didn’t want any surgical intervention. So root stump extractions were to be carried out atraumatically.
Diagnostic impressions were taken with irreversible hydrocolloid (Tropicalgin, Zhermack). Tentative jaw relation was recorded to confirm the adequate interarch distance and treatment planning. After the jaw relations were recorded, Digital Smile Designing (DSD) software was used for getting the planes and teeth alignment as per the facial architecture (Fig. 3). Immediate try in was done for patient acceptance of the new look and was well appreciated by the patient.

Clinical Visit

Metal copings of the bridge work was tried in the patient’s mouth to evaluate for the fit and marginal integrity. Shade selection was done (VITA toothguide 3D- Master, VITA) (Fig. 5) and temporaries re-cemented.

After the ceramic layering was done in the lab, it was verified in the mouth during bisque trial stage and super-imposed with the DSD grid to check if all that was planned is achieved (Fig. 6).

Occlusal interferences in centric and eccentric teeth were eliminated again using the articulating paper (Bausch Articulating paper). Temporaries were re-cemented again.

Laboratory Steps

The interfering marks were removed and the final glazing was carried out (Fig. 7).

Clinical Visit

Occlusion verified again with articulating paper. The bridge was cemented using Glass ionomer cement (GC FUJI) (Fig. 8). Excess cement was removed and dental floss was passed interproximally. Oral hygiene instructions were given. Patient was recalled after 3 month and re-evaluated for maintenance of the oral hygiene instructions (Fig. 9).
Discussion
Because implants were ruled out, attaining retention and stability was a challenge. So care was taken to follow the principles of accurate impression procedures, adequate extension of the denture border as limited by the movable tissues to permit its movement without interference by the denture base\(^4\). Care was taken to avoid violation of the neutral zone which is the most common cause of instability\(^5\). Use of Rhein 83 attachment provided us with added retention component as patient desired.

Summary and Conclusion
Digital Smile Design (DSD) software is a treatment planning tool which can best utilize the scientific concepts of dental esthetics and can incorporate an optimum result of esthetics and function. (Fig. 10).

Acknowledgements
The authors would like to acknowledge Dr. Christian Coachman, Founder of Digital Smile Design (DSD) and Dr. Rajiv Verma, Lecturer, Digital Smile Design, India.
The authors would also like to acknowledge Silver Line Dental Lab (Mumbai), Precision Dental Studio (Mumbai) and Katara Dental Lab (Pune).

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