

SIMPLIFIED SOFTWARE BASED DESIGN AND REHABILITATION OF SMILE THROUGH CERAMIC LAMINATES - A CASE REPORT

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Abstract

Myriad of preoperative assessment method for laminate veneers cases have been proposed. Based upon clinical observations of success and failures associated with the techniques and materials have allowed evolution of effective preoperative assessment and tooth preparations for ceramic veneers. This clinical report describes the use of a clinical diagnostic mock up along with software assessment of a case that required smile restoration.

Key words: Aesthetics, Ceramic laminates, Smile, Veneer.

Introduction

The face is considered as the most recognizable characteristic of the entire body. One of the hallmarks of beauty in today's modern society is a bright, white smile. Successful restoration of dentition utilizes the mechanical, biological and aesthetic principles. Preservation of the remaining tooth structure is most important criteria for longevity of tooth and associated restoration. Ceramic laminate is one of the conservative treatment modality opt for aesthetic correction of the maxillary anterior tooth.^{1,2} This article presents a technique based on initial software based assessment of tooth material and accepted compensation of deficient tooth material with restorative material and final diagnostic clinical mock up for patient acceptance with composite before initiating biomechanical tooth preparation and subsequent final restoration.

Case Report

The patient, a 22-year-old female, reported to enhance smile while reducing the gap between front teeth. The patient was assessed by comprehensive examination reported that consultation with an orthodontist was not satisfactory as the recommended orthodontic treatment plan was lengthy. Medical history, dental examination, periodontal assessment, TMJ evaluation was conducted. Oral examination revealed the presence of full complement of teeth in both the arches. [Figure 1]



Figure 1: Frontal view- Preoperative intraoral view.

The aesthetic zone revealed excessive gap, discoloration from mild fluorosis, and malaligned central incisor with distal tipping of crown.

Standard facial photographs were taken using a digital camera (Canon 600D camera, Canon 80-135 mm Macro lens), and a macro Ring Lite flash (DIGIPRO DP690) on an adjustable tripod (Tanner TR303) elevated to the height of the occlusal plane for digital documentation. Digital tracing of the photographs was carried out by marking a reference line in the anterior dentition. The reference lines drew using the software across the contact length of each tooth and joining the zenith of clinical crown in aesthetic segment. The Digimizer Image analysis (MedCalc Software, version 4.2.5.0) was used for the measurement (in mm) of gap between the central incisors at middle of contact length. Once the measurement in mm received digitally, the reference lines were adjusted digitally to evaluate desired tooth shapes and lengths of the anterior teeth interactively along with satisfactory gap closure. [Figure 2]

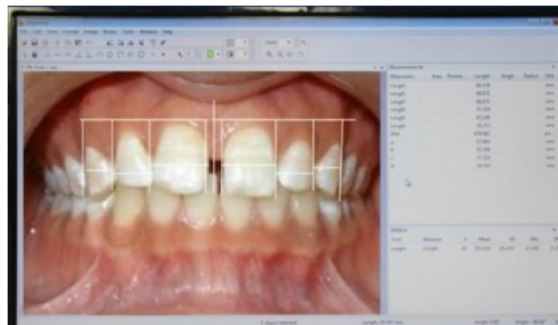


Figure 2: Software based assessment of dentition.

The above details were replicated clinically and compensated tooth materials with ceramic laminates were showed clinically using composite mock up to match the patient acceptance. [Figure 3]



Figure 3: Composite mock-up with gingival zenith location.

The consent was received and the standard biomechanical tooth preparations for ceramic laminate were initiated and finished [Figure 4].



Figure 4: Frontal view- Biomechanical tooth preparations for ceramic laminate.

After gingival retraction the impression procedure using elastomeric (Express™ STD, 3M ESPE, USA) putty-wash impression technique were used. Based on preoperative shade assessment ceramic laminates were prepared and cemented using resin cement. [Figure 5, 6]



Figure 5: Occlusal view- Post operative intraoral view.



Figure 6: Frontal view- Post operative intraoral view.

Discussion

Laminate veneer is one of the most conservative restorative treatment modality. The success rate as aesthetic restoration is 94-96% as noted by long-term clinical study make them restoration of choice where minimal tooth preparation is indicated.^{1,2}

The anterior teeth do not always need complete coverage restoration, intact teeth with no loss of tooth structure function well with the partial coverage restoration.³ In the present case the dentition was with excessive gap, discoloration from mild fluorosis, and malaligned central

incisor with distal tipping of crown. The advantage of applying software based assessment along with clinical mock-up provides precision of the biomechanical tooth preparation. This presents preoperative assessment of final restoration in order to avoid making an error in preparing the tooth insufficiently. The limitation as noted is additive mock-ups may not be effective for severely malformed or malpositioned and crowded teeth that need to be reoriented prosthetically. In such instances, orthodontic tooth movements may minimize tooth preparation, or an initial preparation may be necessary for a good fit of the mock-up over the teeth.^{4,5}

The highly polished surface of ceramic makes it self-cleansing and less plaque retentive. This is more gingiva friendly if highly polished. The main objective of any laminate veneer preparation is the minimum preparation of remaining tooth structure. The etching of the prepared surface was conducted for the better bonding between the tooth surface and the restoration. The gingival retraction was performed for evaluation of the marginal fit of the restoration.

Conclusion

By applying proportions of harmony and balance the artistic beauty of dentistry can be achieved through ceramic laminates. Along with proper communication, digitization and preparation, the patient expectations can be met. Revitalizing smile not only enhances the patient's outer appearance but also improves self-esteem and confidence, bringing out the inner beauty that may have been previously concealed.

References

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