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Case Report

RESTORING SMILES USING DIRECT COMPOSITE RESTORATIONS THE MATHEMATICAL WAY A CASE REPORT

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A R T I C L E I N F O

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A B S T R A C T

The management of the anterior aesthetic zone is always challenging because of the patient's demands. It is very important to restore the teeth in harmonious relationship with the adjacent hard and soft tissue. With the latest trends in minimally invasive restorative dentistry, patients as well as clinicians are opting for bonded composite restorations. The recurring aesthetic dental (RED) proportion is the way in which anterior teeth can be restored in a predictable manner in accordance with the adjacent teeth. The length and width of the teeth is calculated accordingly. By using this technique one can perform highly aesthetic and durable direct composite restorations for anterior space closure. This method is comparatively inexpensive. Composite resin using the RED proportion provides an excellent treatment alternative for patients who are unwilling to undergo orthodontic treatment or in whom previous orthodontic treatment has not produced an acceptable result.

INTRODUCTION

The presence of diastema in the anterior aesthetic zone can be displeasing to a person's smile. Restoring the space while creating harmonious proportions of teeth is difficult to accomplish. Various treatment options are available for closing diastemas including orthodontics or restorative treatment. One of the critical aspects of aesthetic dentistry is creating geometric or mathematical proportions to relate the successive widths of the anterior teeth. The Golden proportion, the Recurring aesthetic dental (RED) proportion, and the Golden percentage are theories introduced in this field.[1] The RED proportion states that the proportion of successive widths of the maxillary teeth as viewed from the front should remain constant, progressing distally.[2]

The following case report highlights the use of RED proportion for analysis of width of maxillary anteriors for diastema closure.

CASE REPORT

A 24-year-old male patient reported with the chief complain of spacing in upper anterior tooth region. Medical and dental history were non-contributory.

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Clinical examination showed spacing between all the upper and lower anteriors. However, the patient was not willing for any treatment in lower arch. Further he was unwilling for any orthodontic correction or indirect restoration and wanted directrestorative treatment to be done.

Oral prophylaxis was carried out. Upper and lower arch alginate impressions were made and a working model was prepared to assess the space.

The (RED) proportion as suggested by Wardwas followed.[2,3]
Technique:

1. Linear Distance from mesio-labial line angle of right canine to left canine was measured. It was denoted as X which was40mm in this case. Total spacing of 6mm was present.
2. Final width of central and lateral incisors that has to be achieved was calculated
3. Assuming the width of central incisor to be Y, lateral incisor width would be 0.7Y as suggested by Ward (70 percent of the width of the central incisor). The final equation was 3.4Y = X. Hence the width of central incisor came to be 11.7mm and lateral incisor as 8.19mm (Figure 2).
4. A template was made. On a white sheet, a vertical line was drawn representing the midline, following which a grid was made with parallel lines separated by distances

equal to calculated widths of central incisors and lateral incisors (Figure 3). In this case spaces were present mesial and distal to central and lateral incisors.

5. First the midline was restored, followed by mesiodistal width of central and lateral incisor with constant rechecking using the template.

Figure 1a,b,c Preoperative photograph

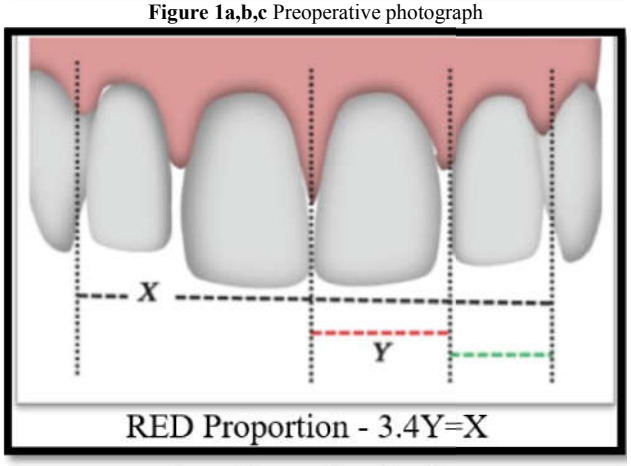

Figure 2 Computation of the width

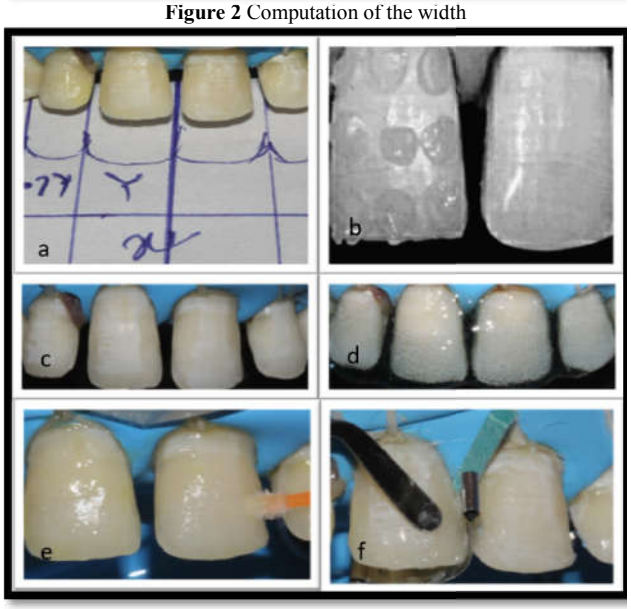

Figure 3 a) Positioning of template b) Shade Selection c)-Bevelling d)-Etching e) Bonding f) Posterior matrix placement for establishing contact

Shade selection was carried with the help of composite button technique for each tooth prior to isolation (Figure 4). Clinical photograph was taken which was then converted into black and white to determine value of the shade. The composite buttons were cured usingA1 shade was selected for incisal and middle third and A2 for cervical third for both the central and lateral incisors.

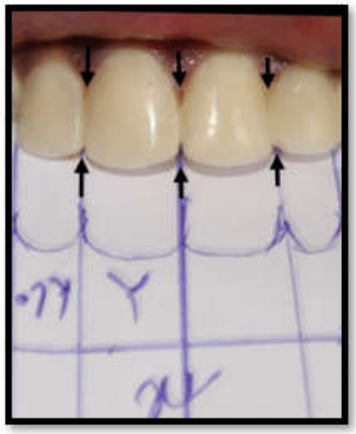

Figure 4 Restored mesiodistal width with the use of template

Rubber Dam isolation was done using Nic tone sheet. This was followed by bevelling on the proximal enamel surface of both the central and lateral incisors (Figure 3). Further etching using 37%phosphoric acid was done for 15 seconds (Figure 3). The etchant was then rinsed with water for 10 seconds and gently air dried. Scothbond Universal adhesive was applied using rubbing motion, gently air dried for 10-15 seconds to remove water and ethanol and cured for 20sec using a QHL75 halogen curing light (Dentsply Caulk, Milford, DE, USA) (Figure 3). The palatal shelf (CE, Filtek Supreme 3M Espe) was created with aid of a silicone index which had been previously fabricated on a wax up followed by incremental composite layering with 12, 11, 21, 22. Proximal walls were build by using posterior sectional matrixto provide the contour (Figure 3). Each layer was irradiated with the same curing light for 20 seconds from the both facial and lingual aspects.

Finishing and polishing was done using Shofu finishing and polishing disks and strips. Figure 4 shows restored mesio-distal width of central and lateral incisors. Figure 10shows the postoperative photographs.

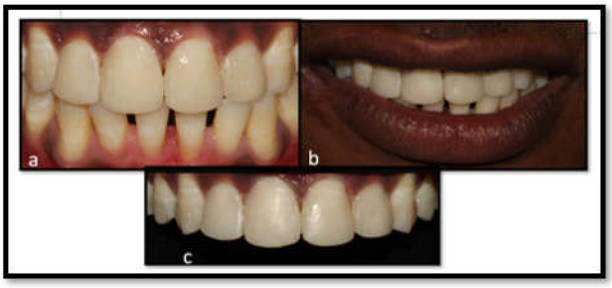

Figure 5 a b c Postoperative photographs

DISCUSSION

Maxillary anterior spacing is a common aesthetic complaint. Golden Proportion has often been considered as a reference in esthetic dentistry,[4]but other principles like Golden Percentage[5] and Recurring Esthetic Dental (RED) proportion[6] have been found to be more pleasing and apt for establishing esthetics.[3]In this case, the patient wanted to get the treatment done within three days due to personal reasons.

Hence direct composite restoration was planned. Composite Restoration was done with 3-D incremental layering technique.

With the use of this direct technique, it was also possible to mask the black triangle which often is a big challenge.

The mathematical RED proportion technique along with the use of template improves the predictability of the treatment outcome and is useful in educating the patient as well as helps them to visualize the final dimensions of his or her teeth. Further the template Provides a constant reminder of the dental midline and the dimensions to be achieved.

CONCLUSION

Mathematical reference in the form of a grid can guide us in determining the dimensions during space closure using direct composite. It can further lessen the uncertainty associated with space closure.

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