ANTERIOR ESTHETIC RESTORATION WITH A MATHEMATICAL TEMPLATE USING RED PROPORTION – A CASE REPORT

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INTRODUCTION

The presence of diastema in the anterior esthetic 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 esthetic dentistry is creating geometric or mathematical proportions to relate the successive widths of the anterior teeth. The Golden proportion, the Recurring esthetic 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.

Clinical examination showed spacing between all the upper and lower anteriors. However patient was not willing for any treatment in lower arch. Further he was unwilling for any orthodontic correction or indirect restoration and wanted direct restorative 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 Ward was 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 was **40mm** 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.

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. A1 shade was selected for incisal and middle third and A2 for cervical third for both the central and lateral incisors. 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 5). Further etching using 37% phosphoric acid was done (Figure 6). Universal bonding agent was applied, thinned out with air drying and cured for 20sec (Figure 7). 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 matrix to provide the contour (Figure 8).

Finishing and polishing was done using Shofu finishing and polishing disks and strips. Figure 9 shows restored mesio-distal width of central and lateral incisors. Figure 10 shows the postoperative photographs.

Figure 1a, 1b and 1c: Preoperative photograph

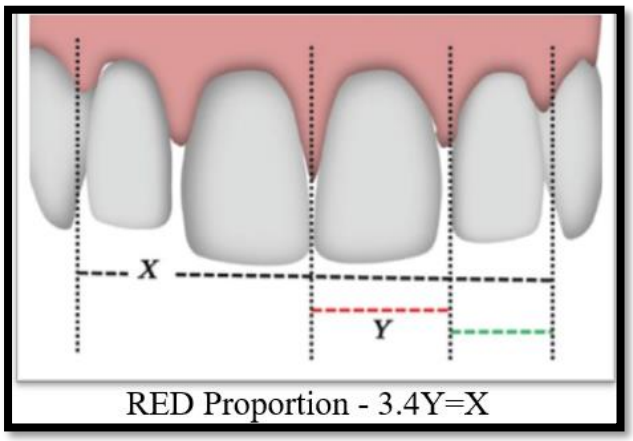

Figure 2 :Computation of the width

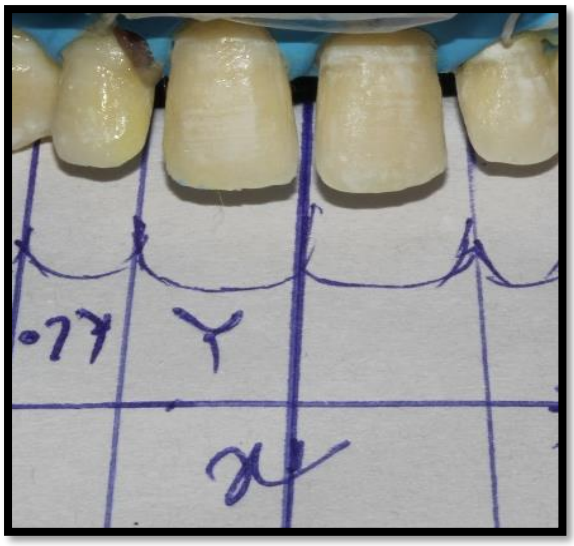

Figure 3: Positioning of template

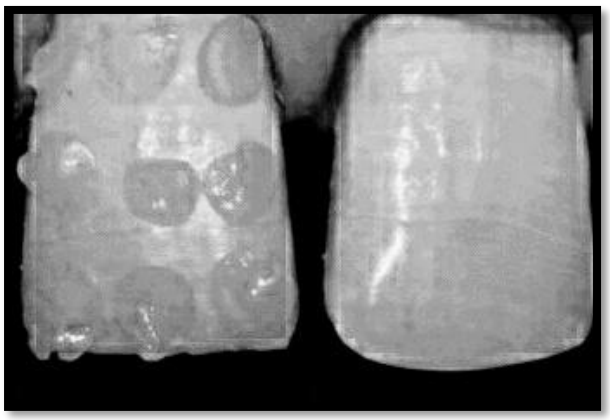

Figure 4 : Shade selection

Figure 5: Bevelling

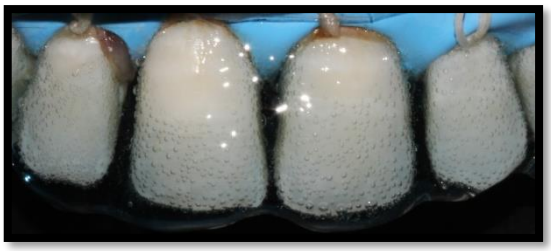

Figure 6: Etching

Figure 7: Bonding

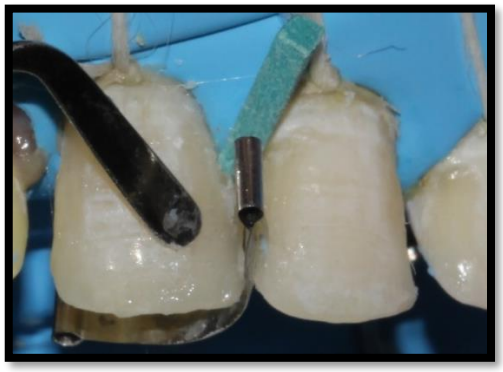

Figure 8: Posterior matrix placement for establishing contact

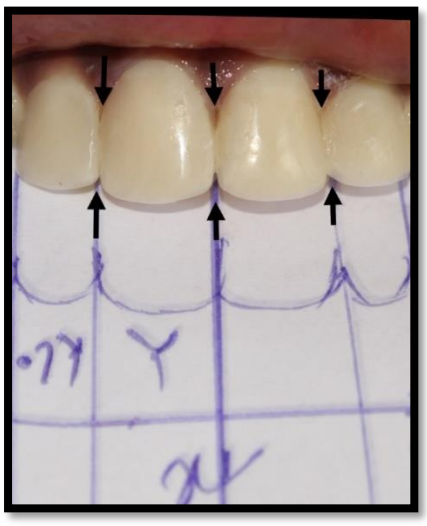

Figure 9 : Restored mesiodistal width with the use of template

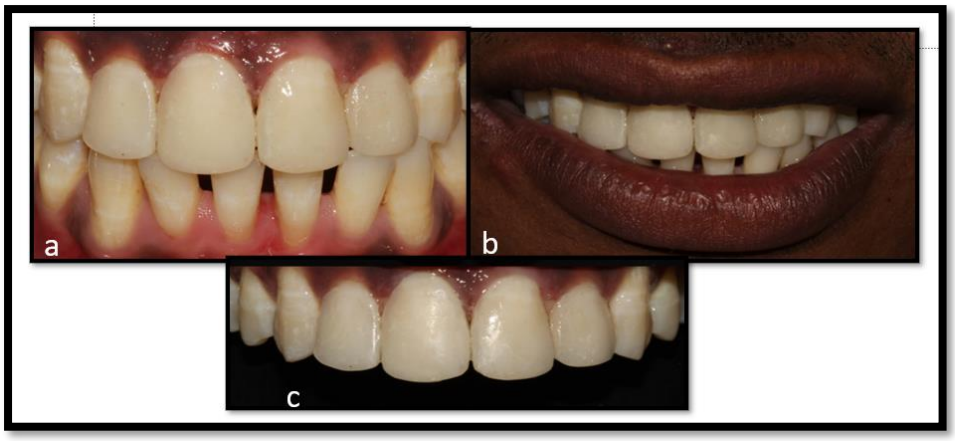

Figure 10a, 10b and 10c: Postoperative photograph

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. He also had monetary issues and lack of time due to a family emergency.

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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