

INTEGRATED ORTHODONTIC-RESTORATIVE APPROACH FOR REPLACEMENT OF A MISSING CENTRAL INCISOR USING CANINE AND LATERAL SUBSTITUTION WITH DIRECT COMPOSITE

INTRODUCTION:

Smile is an important feature of face predicting its attractiveness and need for esthetics will motivate patients to seek dental treatment. Various treatment modalities for esthetic rehabilitation exist like microabrasion, direct composite resin restorations or combination of, indirect composites, crowns, esthetic veneers, and so forth [1]. Direct composite veneers allow operator to control and evaluate entire procedure from shade selection to final morphology usually in a single appointment and it is a most commonly utilized form of veneering [2]. With the advent of microhybrid and nanohybrid composites, finishing and polishing of these restorations can rival that of porcelain [3]. Direct composite veneering results in minimal invasion and maximum preservation of sound tooth structure when compared to indirect restorations. Thus, direct composite resin restorations have become a viable alternative for young patients that require anterior restorative procedures [4].

The present case report deals with the closure of an unesthetic space created due to a missing central incisor that was effectively managed with distribution of space by orthodontic treatment followed by lateral incisor and canine substitution method with direct composite veneering.

CASE HISTORY:

A 21 Year old male was referred from an orthodontist's clinic for esthetic restoration of smile following the orthodontic treatment. Patient's chief complaint was his unesthetic smile associated with spacing between upper front teeth (**Figure. 1**). The patient had missing 11 that has been lost due to trauma 7 years back. As a result, there was a mesial drifting of other teeth making the smile design totally unpleasant. Other initial findings included premolars extrusion, maxillary occlusal cant disruption, lower crowded arch, maxillary canine relation, midline shift and impacted 48 (**Figure. 1, Figure. 2 and Figure. 3**). The treatment plan consisted of an interdisciplinary approach with initial orthodontic intervention followed by restorative management.

TREATMENT PLAN:

- ✓ *Oral prophylaxis*
- ✓ *Extraction of 44*
- ✓ *Surgical opening of flap covering 48*
- ✓ *Extrusion and uprighting of 48 and protracting it mesially* -----
- ✓ *Cant correction by intruding premolars by using miniscrew implants*
- ✓ *Replacement of 26*
- ✓ *Crown w.r.t 15*
- ✓ **Recontouring smile using restorative dentistry** -----
 - **By lateral incisor substitution (12) for central incisor (11)**
 - **By canine substitution (13) for lateral incisor (12)**

Orthodontic intervention of space distribution using pre-adjusted edgewise technique

Restorative intervention by lateral incisor and canine substitution method using direct composites

SMILE CORRECTION BY LATERAL INCISOR AND CANINE SUBSTITUTION METHOD USING DIRECT COMPOSITES:

- 1) **Figure. 4** depicts the stage of referral where, space distribution and maxillary cant correction following orthodontic treatment can be appreciated.
- 2) Space closure and restoration of smile design was successfully done by canine and lateral substitution method which was as follows:
 - a. Modified window preparation was done on the mesial aspect of 12 using diamond burs (**Figure. 5**).
 - b. Shade selection was done under bright daylight followed by isolation using cotton rolls and gingival retraction chord.
 - c. Total etch technique was done followed by bonding procedures.
 - d. Free hand composite build up using Ivoclar Tetric N Ceram composite (Shade A2) according to manufacturer's instructions. (**Figure. 6 and Figure 7**).
 - e. **Figure. 8** show the complete transition of 12 to 11 following substitution method.
 - f. Similarly, 13 was recontoured and a modified veneer preparation was done on its mesial aspect (**Figure.7**).

- g. Direct composite restoration (Shade A2) was done and **Figure. 8** shows the complete substitution of 13 by 12.
- h. Further, mesial aspect of 21 was accentuated with composite (Shade A2) to compensate for increase in the mesiodistal dimension of substituted 12 (ie., transformed 11).
- i. Final finishing and polishing was done using abrasive stones and composite finishing abrasive discs (Composite Finishing Kit, SHOFU). (**Figure.9**).
- j. Comparative evaluation of pre-operative and post-operative procedures was depicted in **Figure.10**.



Figure. 1. Pre-operative Photograph Before Orthodontic Intervention



Figure. 2. Model Analysis



Figure. 3. Pre-operative OPG revealing mesial drift of all teeth due to missing 11



Figure. 4. Space Redistribution done following Orthodontic treatment



Figure. 5. Veneer Preparation in 12- Labial View



Figure. 6. Veneer Preparation in 12- Palatal View



Figure. 7. 12 substitution with 11 and Veneer Preparation in 13



Figure. 8. 12 substitution with 11 and 13 substitution with 12



Figure. 9. Completed space closure treatment depicting reconstruction of 11, 12 and restoration of patient's smile

Pre-operative

Post-operative

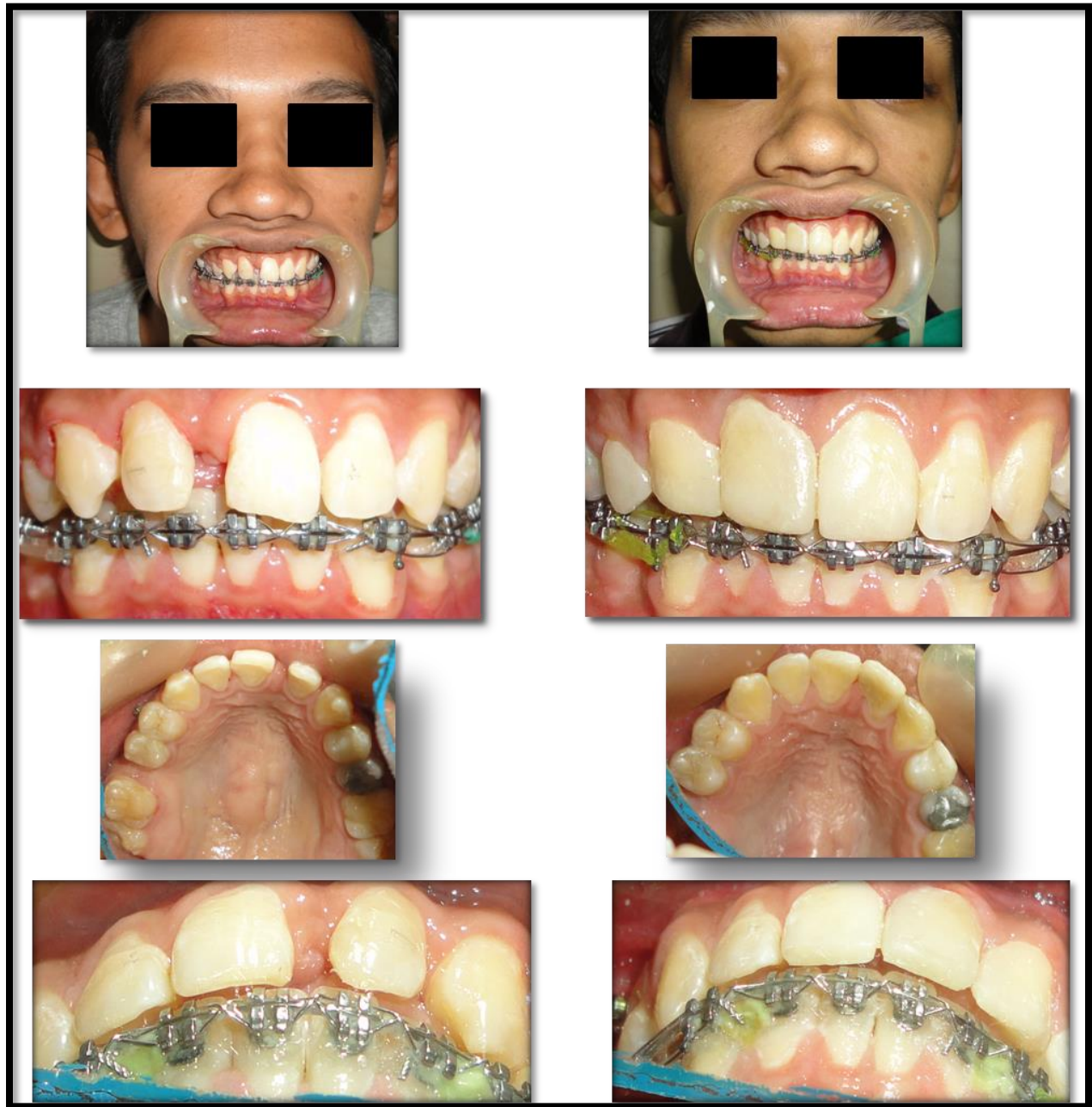


Figure. 10. Comparative Evaluation of Pre-treatment and Post-treatment

CONCLUSION:

Selecting the appropriate treatment option for a missing anterior tooth is quite important and an inter-disciplinary approach is always appreciable, as in the present case [5]. The ideal treatment is the most conservative option that satisfies the individual esthetic and functional requirements. Canine and lateral incisor substitution is a more conservative approach, cost effective and time saving esthetic procedure. However, patient selection criteria are very important which includes factors like: malocclusion, amount of crowding, profile, canine and lateral incisor shape and color and finally lip level [6].

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We certify that we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the writing of the manuscript, to take public responsibility for it and have agreed to have my/our name listed as a contributor. We certify that all the data collected during the study is presented in this manuscript and no data from the case report has been or will be published by the editors, We will provide the data/information or will cooperate fully in obtaining and providing the data/information on which the manuscript is based, their assignees.

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1. Dr. B. SaravanaKarthikeyan (Corresponding Author) 28.08.2020
2. Dr. Nishit Trivedi
3. Dr. J. S. Sivakumar
4. Dr. Shasi Rashmi Acharya

(up to four authors for case report)