# Interdisciplinary approach for improved esthetic results

**G. Sriram, S. Nagalakshmi, K. Balachandar, K. Madhusudan**

Department of Orthodontics, Vivekananda Dental College for Women, Thiruchengode, Namakkal, Tamil Nadu, India

**Address for correspondence:**
Dr. G. Sriram,
E-mail: drgsriram@hotmail.com

Received : 30-03-14
Review completed : 30-03-14
Accepted : 09-04-14

## ABSTRACT

This clinical report describes an interdisciplinary (orthodontic, prosthodontics and operative dentist) approach for the coordinated treatment of an adult patient diagnosed with severely mutilated dentition secondary to caries lesion warranting restorative procedures that was facilitated with orthodontic treatment. The patient's specific esthetic expectation for the anterior teeth and improved smile were successfully met through planned treatment, including orthodontic tooth movement, restoration and porcelain conversion crowns. Such coordinated interdisciplinary evaluations and treatment are necessary for improved esthetics.

KEY WORDS: Canine substitution for lateral incisors, maxillary lateral incisor extraction, rown reshaping

The number of adult patients seeking orthodontic treatment has increased considerably in the past decade. The orthodontic treatment of adult patients most frequently involves more than one discipline. Often orthodontic treatment is required for correcting malocclusions in patients requiring prosthetic replacement of missing teeth, or extracted teeth. Replacement of missing or extracted lateral incisors can be done with a tooth supported restorations like conventional full covered fixed partial dentures or cantilevered partial denture or resin bonded partial dentures or an implant supported crown.[1,2]

Implant supported crowns in the esthetic zone have a high success rate but the biological and technical failures are also frequent and the degree and onset of unaesthetic hard and soft tissue changes around the implant is also not predictable.[3] Fixed partial dentures may be successfully used in favorable situations, but debonding may be a common failure.[2] Long term occlusal and periodontal studies have shown that canine substitution to the lateral incisor can produce a stable occlusal relationship with a modified group function relationship on the working side.[4]

Access this article online

Quick Response Code:

Website: www.jpbsonline.org

DOI: 10.4103/0975-7406.137466

Even though, canine substitution for maxillary lateral incisor is common in case of congenitally missing lateral incisors, therapeutic extraction of a tooth in the esthetic zone (maxillary lateral incisor) is rarely indicated in orthodontics. Maxillary lateral incisor extraction and space closure is considered only when the tooth is decayed beyond the scope of restoration.

## Case Report

The case we present here is about a 53-year-old female patient reported with the chief complaint of unaesthetic smile due to decayed upper front tooth and misalignment. Intraoral examination revealed an angles Class I malocclusion with severe crowding in the upper and lower arch with maxillary right canine labially erupting and maxillary right lateral incisor in cross bite and an inadequate overbite. The upper left maxillary lateral incisor was grossly decayed beyond the scope for restoration, and Class V smooth surface cavity was present in maxillary right canine, left first premolar, mandibular left canine and first premolar. A Class V composite filling with secondary caries was present in maxillary left central incisor [Figure 1]. The patient

**How to cite this article:** Sriram G, Nagalakshmi S, Balachandar K, Madhusudan K. Interdisciplinary approach for improved esthetic results. J Pharm Bioall Sci 2014;6:S192-5.

had an acceptable posterior occlusion, straight facial profile, normal nasolabial angle and a symmetrical face [Figure 2].

## Treatment Objectives

1. To correct the lateral incisor crossbite
2. To relieve the crowding
3. To maintain the Class I buccal occlusion
4. To establish a proper overjet and overbite
5. To create an esthetic smile.

## Treatment Alternatives

### Treatment plan A

Extraction of all first premolars and left maxillary lateral incisor followed by orthodontic treatment for decrowding and closure of premolar extraction space and replacement of lateral incisor with a prosthesis.

### Treatment plan B

Extraction of maxillary lateral incisors and mandibular first premolars and substitution of maxillary canine for maxillary lateral incisor and closure of extraction space in the lower arch. Reshaping and composite resin build up in the maxillary canine to substitute it for the maxillary lateral incisor.

### Treatment plan C

Extraction of maxillary right canine, left lateral incisor and mandibular first premolars followed by orthodontic treatment for aligning, leveling and space closure. Maxillary left canine is substituted for the lateral incisor.

## Treatment Plan

Treatment plan B that is, extracting maxillary lateral incisors followed by canine substitution and also extraction of mandibular first premolars followed by orthodontic space closure was chosen.

## Rationale for maxillary lateral incisor extraction and canine substitution

Any treatment plan should be selected based on the long-term prognosis and stability. Substituting maxillary canines for missing or extracted lateral incisors is a viable treatment alternative to extraction of premolars and replacing the missing or extracted lateral incisors with prosthesis. This can be successfully done in cases with anterior crowding or anterior proclination with a good posterior occlusion and a straight facial profile.[5-8] Adjunctive procedures like reshaping of maxillary canines to lateral incisor and reshaping the palatal cusp of first premolar to avoid functional interferences, composite resin buildups or ceramic veneers to convert the maxillary canine to a lateral incisor and maxillary first premolar to a maxillary canine will help the clinician to achieve esthetic and functionally stable occlusion.[9,10]

## Treatment Progress

### Orthodontic phase

The treatment was initiated with a 0.22" slot Roth prescription preadjusted edge wise appliance. Ceramic brackets were used to meet the esthetic demand of the patient. After initial aligning and leveling space closure was carried out in 0.19" × 0.025" stainless steel archwire with soldered brass hooks and module ligatures [Figure 3]. After finishing and detailing debonding was done.

### Prosthodontic phase

Crown reshaping by reducing the cusp tip and buccal prominence followed by the composite resin buildup on the proximal surface was done in maxillary canine to substitute the maxillary lateral incisors. The palatal cusp of the maxillary first premolars was reshaped to avoid the functional interferences during the lateral excursions. The Class V cavities were restored with composite resin fillings, and a ceramic crown was placed in



**Figure 1:** Pretreatment intraoral photographs



**Figure 2:** Pretreatment extraoral photographs

the maxillary left central incisor [Figure 4]. The straight profile was maintained with a normal nasolabial angle [Figure 5].

## Discussion

The successful substitution of maxillary lateral incisor with a canine depends on so many factors such as the type of malocclusion, the degree of crowding, the size shape and color of the canine, patient profile and the lip line during smiling.[11] The color of the maxillary canine is usually slightly darker than the lateral incisors, and the maxillary canines are slightly wider and longer than the lateral incisor. The morphology of the canine is also different from that of the lateral incisors with a pointed cusp tip in contrast to the flat incisal edge. Vital bleaching or porcelain veneers can transform a dark canine into an optimal lateral incisor shade.[12-14] Esthetic canine tip contouring and composite resin buildup to alter the labial surface crown shape is recommended in canine substitution cases. The contouring should be limited to the enamel and should not expose the dentin. Incremental enamel reduction of 0.25 mm of enamel/6–8 mm weeks is recommended since it encourages the secondary dentin formation and reduces the possibility of sensitivity. Fluoride varnish also reduces sensitivity after enamel reduction.[15] The torque or the labiolingual inclination is also another consideration since the maxillary canines have a more labial root torque or root prominence compared with the lateral incisors. This problem can be solved by bonding the lateral incisor bracket in the canine and canine brackets n the maxillary first premolar. Optimal gingival line can be achieved by selective intrusion or extrusion of teeth or by gingivectomy procedure. Esthetic contouring and composite buildups or ceramic veneers can be done in first premolars to achieve a more esthetic smile.[4]



**Figure 3:** Intraoral photographs showing orthodontic treatment in progress



**Figure 4:** Posttreatment intra oral photographs



**Figure 5:** Posttreatment extra oral photographs

## Conclusion

An interdisciplinary approach is required for management of such cases. Orthodontic space closure of a maxillary lateral incisor extraction provides scope not only for correcting the existing malocclusion, but also provides an esthetically and functionally stable occlusion and anterior smile esthetics.

## References


1. Kinzer GA, Kokich VO Jr. Managing congenitally missing lateral incisors. Part II: Tooth-supported restorations. J Esthet Restor Dent 2005;17:76-84.
2. Kinzer GA, Kokich VO Jr. Managing congenitally missing lateral incisors. Part III: Single-tooth implants. J Esthet Restor Dent 2005;17:202-10.
3. Jemt T. Single implants in the anterior maxilla after 15 years of follow-up: Comparison with central implants in the edentulous maxilla. Int J Prosthodont 2008;21:400-8.
4. Zachrisson BU, Rosa M, Toreskog S. Congenitally missing maxillary lateral incisors: Canine substitution. Point. Am J Orthod Dentofacial Orthop 2011;139:434, 436, 438.
5. Tuverson DL. Orthodontic treatment using canines in place of missing maxillary lateral incisors. Am J Orthod 1970;58:109-27.
6. Thordarson A, Zachrisson BU, Mjör IA. Remodeling of canines to the shape of lateral incisors by grinding: A long-term clinical and radiographic evaluation. Am J Orthod Dentofacial Orthop 1991;100:123-32.
7. Nordquist GG, McNeill RW. Orthodontic vs. restorative treatment of the congenitally absent lateral incisor – Long term periodontal and occlusal evaluation. J Periodontol 1975;46:139-43.
8. Robertsson S, Mohlin B. The congenitally missing upper lateral incisor. A retrospective study of orthodontic space closure versus restorative treatment. Eur J Orthod 2000;22:697-710.
9. Zachrisson BU, Mjör IA. Remodeling of teeth by grinding. Am J Orthod 1975;68:545-53.
10. Swift EJ Jr, Friedman MJ. Critical appraisal: Porcelain veneer outcomes, part II. J Esthet Restor Dent 2006;18:110-3.
11. Kokich VO Jr, Kinzer GA. Managing congenitally missing lateral incisors. Part I: Canine substitution. J Esthet Restor Dent 2005;17:5-10.
12. Rosa M, Zachrisson BU. Integrating esthetic dentistry and space closure in patients with missing maxillary lateral incisors. J Clin Orthod 2001;35:221-34.

13. Rosa M, Zachrisson BU. Integrating space closure and esthetic dentistry in patients with missing maxillary lateral incisors. J Clin Orthod 2007;41:563-73.
14. Rosa M, Zachrisson BU. The space-closure alternative for missing maxillary lateral incisors: An update. J Clin Orthod 2010;44:540-9.
15. Brough E, Donaldson AN, Naini FB. Canine substitution for missing maxillary lateral incisors: The influence of canine morphology, size, and shade on perceptions of smile attractiveness. Am J Orthod Dentofacial Orthop 2010;138:705.e1-9.

**Source of Support:** Nil, **Conflict of Interest:** None declared.

Copyright of Journal of Pharmacy & Bioallied Sciences is the property of Medknow Publications & Media Pvt. Ltd. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.