

# Aesthetic Rehabilitation of Peg Shaped Laterals with all Ceramic Fixed Partial Denture: A Case Report

**Dr. Sunil Dogra**  
P.G.Student

**Dr. Maya Dalaya**  
Professor

**Dr. Mahesh Ghadage**  
P.G.Student

**Dr. Geeta Hatte**  
P.G.Student

Department of Prosthodontics  
Bharati Vidya Peeth Dental College & Hospital, Navi Mumbai

## Abstract

Peg shaped laterals describes a condition where the second tooth on either side of the upper front teeth does not develop correctly, and is small often pointed, and look like a cone. This article describes a case of rehabilitation of missing central incisor and peg shaped lateral teeth with zirconia based fixed partial denture. This aspect was compromising the self satisfaction of the patient. He desires a more attractive appearance. There are different treatment options for this anomaly; implant placement in missing tooth area and then individual crowns on central and lateral, fixed partial denture including laterals and central incisors. Due to cost factor of implant it was decided to treat with Zirconia Bridge.

**Key word:** Aesthetics, Discoloration, Zirconia, Fixed partial denture.

## Introduction

The restorations of anterior maxillary teeth are one of the aesthetic challenges in fixed restorations. Proper shade selection, choice of ceramic system and appropriate communication with the dental technicians are combined factors for success.<sup>1</sup> The development in dental materials, dental technology (CAD/CAM), patient demand for appearance have led to the introduction of many different restorative systems for all ceramic fixed dental prosthesis.<sup>2</sup> The metal free crown and bridge are considered an alternative solution because of their enhanced esthetics, biocompatibility and inertness, and they appear to be replacing metals as the core material of choice for crown and fixed partial denture.<sup>3</sup> During the last decade, densely sintered zirconia based restorations have become available. These ceramic systems utilize yttrium-tetragonal polycrystal (Y-TZP OR partially stabilized zirconia). This material appears to have superior mechanical properties, high flexural strength and toughness to allow for the fabrication of anterior and posterior crowns and fixed partial denture.<sup>4</sup> It is important for a practitioner to understand different ceramic systems and select

appropriately in achieving desirable treatment result and patient satisfaction. This clinical report describes the procedures used for the restoration of maxillary incisors with zirconia-based cercon system.

## Case Report

A 28 year male patient came to the department of Prosthodontics in Bharati Vidyapeeth Dental College and Hospital, Navi Mumbai with a chief complaint of missing upper right central incisor and pointed lateral incisors (FIG 1). Patient was using interim prosthesis from the last 2 years. During oral examination it was seen that both the lateral incisors are peg shaped and discoloration of 21 teeth.

1. Treatment modalities including implant placement in upper right central missing tooth area and composite restorations on both the lateral incisors.
2. All ceramic restoration including central and both the lateral incisors.
3. Metal ceramic restoration including central and both peg shaped laterals.
4. Maryland resin fixed bonded restoration replacing only central incisor.

Patient disagrees for implant restoration due to cost factor and time. He was not willing even for metal ceramic bridge due to metal show in the marginal area; Maryland

bridge was not involving the other lateral incisor. It was decided to restore with metal free restorations (cercon system zirconia based) as patient requested the improvement of his discolored central incisor as well as peg shaped laterals with esthetic enhancement and price conscious treatment possible.

Upper and lower diagnostic impression was taken with alginate and casts were poured, articulated and diagnostic waxup was done on the cast and showed it to patient (FIG 2). Intentional root canal treatment was done on 12, 21, 22. Before tooth preparation, occlusion was analyzed. Shade selection was carried out in a properly lighted environment to match the adjacent normal teeth vita classic shade guide. After breaking the contact with a tapered fissure diamond bur, 2mm incisal reduction, 1.0-1.5mm lingual reduction, 1.0-1.5mm labial reduction was done. All the line and point angles were rounded with no undercuts. Deep chamfer was given as a finish line (FIG 3). Occlusal clearance was checked with the help of modeling wax sheet. Gingival retraction was carried out for proper marginal impressions. After retraction impressions were made by putty wash technique with addition silicon

material. Prior to the construction of the final prosthesis, the provisional restorations were fabricated with protemp. After 1 week, zirconia copings were tried in patient mouth to check for fit (FIG 4). Once the copings were layered with compatible porcelain system (CERAMCO, DENTSPLY CERAMCO), it was luted with a resin cement (RELYX U 200, 3M) and occlusion was checked (FIG 5). After completion of the treatment, patient was recalled after 6 months, the restorations were intact and no change was seen and patient was satisfied with the appearance (FIG 6).

### Discussion

The zirconia material typically used by most manufacturers is a tetragonal polycrystalline zirconia, partially stabilized with yttrium oxide. Zirconia has high biocompatibility and no local (cellular) or systemic adverse reactions to the material were reported.<sup>5</sup> Zirconium dioxide appears as a monoclinic, cubic or tetragonal polymorph. At room temperature only the monoclinic  $ZrO_2$  exists. This phase is stable up to 1170° c when it inverts to tetragonal, metas-table phase, whereas above 2370° it turns into a cubic. It has high flexural strength of more than 1000 MPa. Hardness of 1200-1400 vickers.<sup>6</sup> Classically, the porcelain fused to metal crown that has been used in for esthetic restoration has limitations in color reproduction to the natural teeth due to the metal exposure in the marginal portion and unnecessary reflection resulting from the light of the opaque layer.<sup>7</sup> Currently available all ceramic systems can be categorized broadly into two groups: those that are translucent and those that consist of opaque, high strength core onto which esthetic layering ceramic must be applied to achieve a natural appearance.<sup>8</sup> Many ceramics such as spinel, alumina, and ceramic reinforced with lithium disilicate, have been proposed for the construction of metal free restorations.<sup>9</sup> Recently zirconia based all ceramic restorations are present in market.

Upon looking at recent research about these products, the esthetic value and translucency is higher for heat-pressed glass ceramic or alumina rather than zirconia which is superior in strength.<sup>10</sup> According to other reports that observe the translucency of the core, the translucency declines from heat-pressed glass ceramic to alumina and to zirconia and the masking ability is superior.<sup>11</sup>

### Conclusion

Metal free crowns can allow for highly aesthetic solutions such as color correction, matching and allow us to reshape malformed teeth or reshape teeth which are in incorrect arch positions, to more closely approximate their correct shapes. These types of cases can give utmost satisfaction to

the clinician and provide psychological and functional benefit to the patient. For esthetic prosthetic restoration, various ceramic systems have been developed to reinforce both strength and esthetics. Clinicians are required to understand the own distinct character and indication of each system in order to select an appropriate one for the patient situation.

### References

1. Kahng LS. Patient-dentist-technician communication within the dental team: Using a colored treatment plan wax-up. *J Esthet Restor Dent.* 2006; 18(4):185-93; discussion 194-5.
2. Lawn BR, Pajares A, Zhang Y, et al. Materials designing the performance of all-ceramic crowns. *Biomaterials* 2004; 25:2885, 92.
3. Polack MA. Restoration of maxillary incisors with a zirconia all-ceramic system: a case report. *Quintessence Int.* 2006; 37: 375-80.
4. Komine F, Blatz MB, Matsumura H. Current status of zirconia-based fixed restorations. *J Oral Sci.* 2010; 52(4):531-9.
5. Saridag S, Tak O, Alniacik G. Basic properties and types of zirconia: an overview. *World J. Stomatol.* 2013, 2, 40-47.
6. Shori K, Shori T, Shori D, Chavan R. Achieving Esthetic Perfection By Zirconia : A Case Report. *Int J Dent Med Res* 2015; 1(6):146-149.
7. Fradeani M, Redemagni M. An 11-year Clinical Evaluation Of Leucitereinforced Glass-ceramic Crowns: A Retrospective Study. *Quintessence Int* 2002; 33: 503-10.
8. Spear F, Holloway J. Which All-ceramic System Is Optimal For Anterior Esthetics? *J Am Dent Assoc.* 2008 SEP; 139 SUPPL:19S-24S.
9. Raigrodski Aj. Contemporary Materials And Technologies For All-ceramic Fixed Partial Dentures: A Review Of The Literature. *J Prosthet Dent.* 2004; 92:557.
10. Heffernan Mj, Aquilino Sa, Diaz-arnold Am, Haselton Dr, Stanford Cm, Vargas Ma. Relative Translucency Of Six All Ceramic Systems. Part I: Core Materials. *J Prosthet Dent.* 2002; 88:4-9
11. CHU FCS, Chow Tw, Chai J. Contrast Ratios And Masking Ability Of Three Types Of Ceramic Veneers. *Jprosthet Dent* 2007;98: 359-64.



Fig. 4



Fig. 5



Fig. 6

### Legends:



Fig. 1

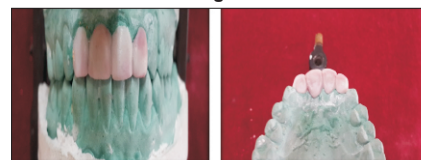


Fig. 2



Fig. 3