ALL CERAMIC SYSTEM TO MASK GINGIVAL DISCOLOURATION - A CASE REPORT

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Dentistry today not only focusing on prevention and treatment of diseases but also full filling the demand of the people for better aesthetics. Recent advances in technology and dental materials have prompted the development of a large number of all-ceramic systems for fabrication of full coverage restoration. These crowns are clinically more acceptable due to their enhanced aesthetic, biocompatibility and inertness[1] and



Fig 1. Gray discoloration around marginal gingiva of maxillary central incisor.

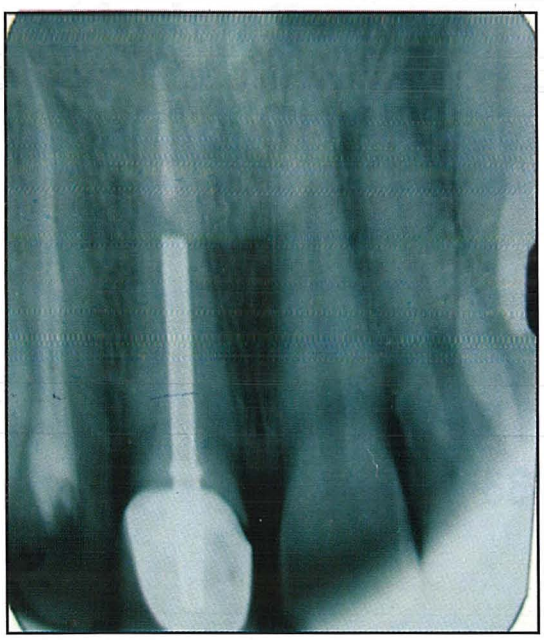


Fig 2. Properative Radiograph of Maxillary central incisor.

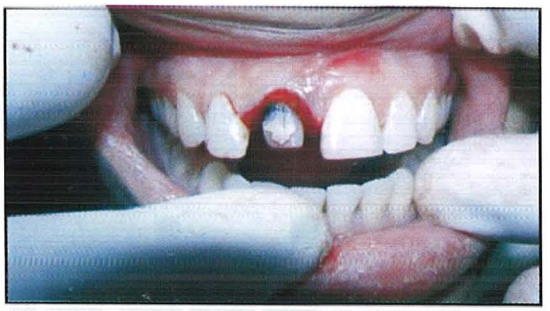


Fig 3. The preparation is modified for all ceramic crown and retraction of marginal gingiva done before final Impression.



Fig 4. Temporary crown relined and cemented.



Fig 5. Final Prosthesis was satisfactory in relation to esthetics and function.

they are replacing metal as a core material for crown. Development of digital technology have improved the accuracy and aesthetics of all ceramic system and are providing better aesthetics than previous all ceramic system. This case report presents the management of a central incisors with an all-ceramic system.

Key words: All ceramic crown, Full coverage restoration, Zirconia.

All ceramic crowns were used to be made up of single layer glass ceramic- Dicor (Dentsply/ Caulk), IPS Empress (IVOCLAR). Their failure rate was high in certain cases[2]. A new system was developed to overcome these failures, utilizing a bilayer design, where an Alumina base core, either glass infiltrated[3] or densely sintered[4], support the veneering porcelain applied over this core for aesthetic reason. These systems have shown a lower failure rate for single crown.[5]

Recently, densely sintered zirconia based cores have become available[6,7]. These ceramic systems utilize Yttrium-Tetragonal Zirconia polycrystal (Y-TZP or partially stabilized Zirconia) for the fabrication of anterior and posterior crown and fixed partial dentures. "Transformation toughing" where the presence of stabilizing oxide yttrium oxide holds the material in a stable tetragonal state, provides a unique toughing mechanism to enhance the ceramic properties for load-bearing application[8]. Y-TZP has a flexure strength of 900 to 1200 MPA, which is considerably higher than that reported for densely sintered alumina[9] and glass infiltrated alumina/ zirconium dioxide material[10]. In addition Y-TZP does not seem to be as sensitive to moisture- induced strength degradation as are other ceramics[11]. The following report describes the restoration of upper right maxillary central incisor with Zirconia all ceramic Crown.

Case Report

A 24 yrs old girl reported to the Dept of Prosthodontic with gray discoloration of gums in relation to upper right front tooth region. The dental history revealed that she got her maxillary right central incisor fractured 10 yrs back which was later root canal treated and a PFM crown was fixed on the same.

On clinical examination, there was deposition of plaque and mild staining of teeth. The clinical crown of tooth 11 was short as compared to the tooth 21 but not discolored. There was protrusion of anterior teeth with spacing (Figure-1). An intra oral periapical radiograph of maxillary central incisors revealed post and core in tooth 11 (Figure-2) and root canal treatment in tooth 12 and no periapical radiolucency was present in relation to any tooth.

The treatment Plan included oral prophylaxis, Orthodontic correction with fixed appliance for malocclusion (ant spacing), removal of PFM crown, crown lengthening, and all ceramic crown in tooth 21. But patient refused to undergo orthodontic treatment.

First Appointment- The PFM crown was removed by cutting the crown with carbide bur as the tooth was root canal treated and fitted with post & core. Tooth was root canal treated and fitted with post & core; The secondary caries present on labial surface was excavated and restored with composite. Gingivectomy was done to increase the clinical crown length. Temporary crown was fabricated with Protem -4 (3M ESPE) and cemented by using non-eugenol Temporary cement, freegenol Temporary pack(GC). Patient was recalled after 2 weeks.

Second Appointment- Gingiva was healed properly and discoloration is reduced. The preparation is modified for all ceramic crown, deep chamfer margin prepared and gingival retraction done before final impression (Figure-3). Final impression made by Polyether elastomeric impression material (3M ESPE). Temporary crown relined using Protem - 4 (3M ESPE) and again cemented using non-eugenol Temp cement (Figure 4). Impression was send to lab

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for all ceramic crown (Lava). The shade was determined with a shade guide (Vita) & through pre & intra-operative photograph.

Third Appointment- After one week temporary crown was removed and all ceramic crown was cemented with self etch Unicem luting cement (3M ESPE) after minor intraoral adjustment. The crown length of tooth 11was improved was equal to tooth 21, the color of gingiva returned to normal. Final results were satisfactory in relation to esthetics and function (Figure-5).

Discussion

Many all ceramic system are available. Out of all these Zirconia all ceramic Crown was selected in this case. This was a discolored tooth, Zirconia is opaque and it can mask this discoloration better than Alumina crown. Hefferman et al suggested that zirconia restoration would be better suited to match opaque, high value teeth[12].Lava is a computer assisted design/ computer-assisted manufacturing (CAD/CAM) system designed for the creation of anterior posterior crown & fixed partial dentures copings. The coping is veneered with Lava Ceram porcelain. There are other restorative systems available that use Zirconia for fabrication of coping. One of them is (DCS Smart-Fit) is a CAD/CAM system that utilizes fully sintered Y-TZP under hot isotonic pressure. This result in an extremely hard and dense ceramic[11] that require milling time of around 2 to 4 hours for a coping[13]. In contrast Lava crown employ partially sintered Y-TZP milling blocks that are weak but easy to mill[12].

Procera, a CAD/CAM system that until recently utilized only densely sintered alumina, added Zirconia (Procera Zirconia, Nobel Biocare) as an option for fabrication of single and multiple-unit restoration[14]. One other system (Inceram Zirconia,Vident) employs a glass-infiltrated 35% Zirconia, 65% Alumina material for fabrication of posterior crown & FPDs[10] that can be slip cast or milled from presintered blocks. Its flexure strength is about 620MPa[15], which is lower than that reported for densely sintered Zirconia, the ceramic used in other system mentioned above[11]

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