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Case Report

Aesthetic and functional rehabilitation with pressable ceramics

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Introduction

When the aesthetics of an individual is concerned, a captivating smile is a dominant characteristic. The main objective of cosmetic dentistry is to impart optimum aesthetics. Advancements in the field of adhesive dentistry and ceramic technology have broadened the use of all ceramic restorations significantly.¹ These restorations that were introduced by Dr. Charles Land in 1903, have undergone significant improvement and refinement over the past few decades, and have now matured into a predictable treatment option in terms of longevity, periodontal response and patient satisfaction.^{2,3}

Case report

A 39-year-old female patient had reported to our department with the chief complaint of poor smile due to loss of crowns and unaesthetic gaps in between the front teeth [Fig. 1]. Detailed history revealed that the patient had met with an accident five years back and sought treatment from a dental facility. The patient had been rehabilitated with ceramo-metal crowns on upper incisor teeth. The patient was not happy with the contour and colour of the crowns and complained about frequent dislodgement of the crowns.

Intra oral examination revealed that the patient had full complement of dentition. Even though endodontic treatment was attempted on involved teeth but it was not completed. Statement of problems that had to be addressed were loss of crowns, loss of foundation for subsequent prosthodontic procedures on tooth no 12 and 22 and complete loss of incisal guidance. After a thorough consultation, the case was taken up for comprehensive prosthetic rehabilitation of the anterior teeth with endodontic treatment followed by new all ceramic crowns fabricated using "Pressable Ceramic Technology."

Procedure

Endodontic treatment was completed for the upper incisors and post and core restorations were fabricated on 12 and 22. Extra-coronal preparations were completed for "All Ceramic Crowns" on maxillary incisors. Diagnostic casts of maxillary

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Fig. 1 – Unaesthetic smile due to the loss of crowns and tooth structure.

and mandibular arches were made. Maxillary cast was oriented and articulated on to the upper member of Hanau H2 articulator via face-bow transfer and mandibular cast on the lower member of the articulator at the Maximum Inter-cuspal position (MICP) with the maxillary cast. Articulator was programmed using protrusive inter-occlusal records. Diagnostic wax patterns were fabricated and the incisal guidance was optimized using a customized incisal table fabricated out of pattern resin. The incisal table was fabricated by placing the pattern resin on the incisal table of the articulator and moving the upper member along with the incisal pin antero-posteriorly and laterally. Palatal contours of the wax patterns were carved and finished as per the customised incisal guidance table. Putty index of finished patterns was made using PVS putty consistency material and it was kept aside for the fabrication of provisional restorations.

Later PVS putty wash impression of the maxillary arch was secured and the master cast was fabricated. Provisional crowns were fabricated using crown and bridge composites utilizing the putty index made previously. Provisional crowns were verified for optimal incisal guidance intra-orally. Later the provisional crowns were finished polished and cemented using provisional luting cement.

Diagnostic maxillary cast mounted on to the upper member of the articulator was replaced with the master cast [Fig. 2] after the preparation of dies. Wax patterns were fabricated using residue free wax and the patterns were finished, sprued and invested after the verification of the palatal contours.

All Ceramic crowns were fabricated using lost wax technique employing neutral shaded, leucite based precerammed ingots. Once the pressing was carried out the crowns were divested, finished and characterized by staining technique [Fig. 3] after shade matching. The crowns were tried intra-orally for verifying the aesthetics and function. Later the crowns were bonded using dual cure resin cement.

The patient was evaluated after one week. A definitive improvement in smile, aesthetics and morale of the patient was noticed [Fig. 4].

Fig. 2 – Fabrication of customized incisal table with pattern resin.

Discussion

The combination of composite based resin luting systems and low fusing porcelains has marked a major milestone in the area of aesthetic restorative dentistry. These two materials make it readily possible to fabricate restorations of great aesthetics, function and strength.⁴ Even though this modality is more invasive in comparison to veneers, PFM crowns etc., it is still the most effective than other alternatives available in the practice of contemporary aesthetics dentistry in terms of translucency, fluorescence, biocompatibility and inertness.⁵

All ceramic crowns could be fabricated by layering technique, in which the copings are pressed and subsequent layers of ceramics were applied and fired on to the coping to impart a “life-like” appearance to the tooth. A relative simple and less time consuming method is the “Characterization technique” to match the shade for optimizing the aesthetics. In this technique anatomic crown forms were pressed and the crowns are characterized to mimic missing tooth by

Fig. 3 – Characterization of pressed anatomical crowns by staining technique.

Fig. 4 – Definitive improvement in smile, aesthetics and morale of the patient.

staining them with special ceramic stains provided by the manufacturer.

Molds for pressable dental ceramics are formed by lost wax technique.³ Pressable ceramics are available as glass-ceramic ingots which are supplied from manufacturers. The ingots have a similar composition of powder porcelains. However, they have less porosity and more crystalline content.⁶ The ingots are heated to a high temperature where they become a highly viscous liquid, and then pressed slowly into the formed mold. The advantage of this technique is that it utilizes the experience that the lab technician already has in lost wax method with metal alloys.⁷

Patients rehabilitated with “all ceramic crowns” are required to maintain scrupulous oral hygiene since occurrence of secondary caries of abutment is one of the leading

complications of FPDs supported by the natural dentition.⁸ The optimally developed incisal guidance is very important since it has got a great relevance in affecting the aesthetics, phonetics and posterior teeth disclusion on excursive movements in patient’s mouth.

Conflicts of interest

All authors have none to declare.

REFERENCES

1. Kelly JR, Nishimura I, Campbell SD. Ceramics in dentistry: historical roots and current perspectives. *J Prosthet Dent.* 1996;75(1):18–32.
2. Griggs JA. Recent advances in materials for all-ceramic restorations. *Dent Clin North Am.* 2007;51(3):713–727.
3. Aunsavice KJ. Dental ceramics. In: *Phillips’ Science of Dental Materials*. 12th ed. St Louis, Missouri: Saunders Elsevier; 2012:418–473.
4. Leinfelder KF. Porcelain aesthetics of 21st century. *J Am Dent Assoc.* 2000;131:47–51.
5. Sakaguchi RL, Powers JM. Restorative materials – ceramics. In: *Craig’s Restorative Dental Materials*. 13th ed. Philadelphia: Mosby Elsevier; 2012:259–262.
6. Sulaiman F, Chai J, Jameson LM, Wozniak WT. A comparison of the marginal fit of In-Ceram, IPS Empress, and Procera crowns. *Int J Prosthodont.* 1997;10(5):478–484.
7. Yeo IS, Yang JH, Lee JB. In vitro marginal fit of three all-ceramic crown systems. *J Prosthet Dent.* 2003;90(5):459–464.
8. Goodacre CJ, Guillermo B, Rungcharassaeng K, Kan JYK. Clinical complications in fixed prosthodontics. *J Prosthet Dent.* 2003;90:31–41.