Management of Tetracycline-Stained Teeth with Full Coverage Translucent Zirconia Crowns- Case Report

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Abstract

Background: Tetracycline has long been used as an antibiotic to treat several common bacterial infections. But it’s use has long been associated with the common dental problem of tetracycline staining which causes esthetic issues for patients. Gastroesophageal Reflux Disease (GERD) is a common disorder in the public that results when the lower esophageal sphincter is abnormally relaxed or has a low resting pressure. The acidic contents of the stomach can be regurgitated into the esophagus and occasionally into the oral cavity causing severe hard tissue damage. The following case is of a patient who presented with a combination of tetracycline staining and GERD and the management of this patient’s esthetic and functional chief complaints.

Case Description: We present the case of a 64-year-old Caucasian male who presented to the ECU School of Dental Medicine Advanced Care Clinic. The patient’s chief complaint was that he was experiencing esthetic and functional problems due to tetracycline staining and acid erosion from GERD on his maxillary anterior dentition. Evaluation presented severe acid erosion on teeth 6 through 11 with generalized tetracycline staining, most prominently on teeth 6 through 11. The patient opted to pursue full coverage translucent zirconia crowns on teeth 6 through 11. Diagnostic wax up and try-in were completed and the patient was satisfied with the proposed treatment plan. Lab fabricated zirconia crowns were then delivered on teeth 6 through 11. The patient was satisfied with the esthetic and functional result.

Conclusion: Tetracycline staining varies in severity, proper planning can enable execution of the most appropriate restorative, and preservation of healthy tooth structure. A detailed and comprehensive treatment plan is significant for achieving successful esthetic restorative outcomes. However, these results are only possible with collaboration and appropriate communication among laboratory, patient, and dentist.

Introduction

The dental treatment of anterior dentition poses many challenges and potential complications. Patients who present with tetracycline staining and acid erosion due to GERD have high esthetic and functional expectations. A comprehensive treatment plan approach is critical to treating these cases. The results of these treatments can be very rewarding and life changing for patients but should be approached in a way as to maximize results while minimizing tooth structure removal. Many crown material options are available when it comes to treating the issues of tetracycline staining and GERD related acid erosion. These include porcelain fused to metal, zirconia, and lithium disilicate. Each of these materials pose different esthetic, strength and functional properties that must be evaluated prior to treatment.

The treatment of this case involved a comprehensive approach involving prosthodontics, periodontics and cosmetic dentistry. Successful treatment of cases like this are important to evaluate as reference for treating future cases. Especially since esthetic complications play a huge role in patient chief complaints and treatment desires.

Case Report

- Medical and dental history reviewed and updated. Prophylaxis, periodontal exam, radiographic and periodic oral evaluation completed.
- Diagnostic casts and intraoral photos obtained.
- Wax up completed and putty guides fabricated for mockup.
- #6–#11 mockup completed using Integrity A2 temporary material.
- #6–#11 full coverage zirconia crown preparations completed.
- Laser gingivectomy completed on teeth #6, #8, #9, and #11.
- CAD/CAM Cerac scan obtained along with a PVS definitive impression.
- Shade selection completed using VITA Easy shade: Incisal: 2M2; Mid: 3M2; Gingival: 3M2.5, Stump: SM3.
- #6–#11 splinted provisional using Integrity A2.
- #6–#11 Translucent Zirconia Crowns Cemented using 3M Rely-X Luting Plus Auto mix.
- Follow-up, Final Polish, and Final Photographs Obtained.

Results

The results of this case was the successful rehabilitation of the maxillary anterior dentition of a patient suffering from tetracycline staining and GERD related acid erosion. The use of translucent zirconia crowns provided with an esthetic, strong and functional result that the patient was satisfied with.

Discussion

A detailed and comprehensive treatment plan is significant for achieving successful esthetic restorative outcomes and provides a valuable and efficient roadmap toward exceeding patient expectations. In this case, such planning enabled incorporating translucent Zirconia crowns that ultimately satisfied the patient’s request for improved facial esthetics, as well as the dentists’ requirements for establishing functional occlusion.

Patients with tetracycline staining and/or acid erosion from GERD have many esthetic and functional concerns that must be addressed for proper treatment planning. This case displays a typical representation of these issues with successful treatment.

The use of translucent zirconia crowns as opposed to other crown material options was the most significant point of this case. When considering lithium disilicate crowns, which are the most typically used material for anterior dentition, the show through transparency must be considered. For the case of tetracycline staining, a restorative material that did not show very much of the stump shade was necessary as the stump shade was very dark and would have posed esthetic problems. PFM crowns were also an option but would have posed the opposite problem of not being translucent enough and would have posed esthetic problems as well. The technique used for fabricating translucent zirconia crowns allows for a gingival, mid, and incisal shading technique that makes for a very accurate and esthetic shade match. The VITA Easyshade device was used to obtain a gingival, mid and incisal shade which was reported to the dental laboratory to allow them to stain the zirconia to achieve a very esthetic result.

Conclusions

Within the confines of this case report, translucent zirconia crowns have proven to be an effective, strong, and esthetic treatment options for patients who are suffering from tetracycline staining and GERD related acid erosion. Translucent zirconia provide strength and durability while also providing the esthetic and shade matching capabilities that patients desire and should be provided as an option for patients seeking anterior dental rehabilitation.

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