Implant-Supported Fixed Dental Prostheses With CAD/CAM-Fabricated Lithium Disilicate Veneer and Lithium Disilicate-Based Framework

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Abstract

All-ceramic abutments are employed increasingly often in implant dentistry for aesthetic reasons. Ti-Base lithium disilicate (IPS e.max CAD , Ivoclar Vivadent) implant abutment with lithium disilicate (IPS e.max CAD,Ivoclar Vivadent) laminate provides predictable and durable restorations, which provide the best possible aesthetic outcome.

A total of 3 patients were restarted with 6 implants in the aesthetic zone. Three months later, the prosthetic procedures were passed. A screw-retained provisional restoration was shaped of the soft tissue for two months. Lithium disilicate laminate veneers on CAD/CAM Ti-base lithium disilicate abutments was selected. The frequency of prosthetic and biologic complications, and aesthetic outcomes were evaluated after 1 year.

Considering the calculated survival rate, the application of lithium disilicate implant abutments in the anterior region can be recommended as a reliable therapy. The present work was supported by the Research Foundation of Istanbul University. Project No. 25956

Background and Aim

Lithium disilicate material had been widely marketed, because of the adhesive properties of this material and its preservation of tooth structure. The computer-aided design/computer-aided manufacturing (CAD/CAM) of lithium disilicate abutments has resulted in improved soft tissue responses^{1,2,3}.

Although lithium disilicate abutments may benefit both colour and contour management of soft tissue aesthetics using patient-specific abutments, the mechanical risks of such clinical desicians require further exploration^{3,4}. Lithium disilicate abutments offer aeshtetic advantages when ceramic materials are also used for laminate veneers. This aesthetic solution uses nothing more than thin ceramic fragments but presents excellent optical properties^{2,4,5}. This clinical report describes the use of lithium disilicate restorations with laminate veneers.

Methods and Materials

The prosthetic planning was performed using information gathered from the clinical chart, radiographs, and diagnostic casts (Figure 1 and 2). The provisional restoration was fabricated on the soft tissue cast to create the same contours as the buccal aspect of the adjacent teeth (Figure 3 and 4). At this time, a define discontinuity existed between the contour of the provisional restoration at the gingival aspect of the crown and the wildth of the fixture margin (Figure 5). The temporary abutment was connected to make screw retained provisional restoration.

Rehabilitation by implants supporting a prosthesis constucted of lithium disilicate implant abutments which are prepared buccal areas. Implant crowns were planned as screw-retained restorations, which were screwed witj a controlled torque of 30N according to the implant provider's recommendations (Figure 6).

The internal surface of the laminate veneers and abutments was etched with 9% hydrofloric acid (Ultradent Porcelain Etch, South Jordan, UT, USA) for 90 seconds, washed under water, and air-dried. Silane agent was applied (Monobond, Variolink Veneer, Ivoclar, Vivadent) for 1 minute, followed by a layer of adhesive (Heliobond, Variolink Veneer, Ivoclar, Vivadent)(Figure 7). The adhesive should not be polymerized in this stage. In the dental substrate, a total etching technique was carried out using 37% phosphoric acid (Nova DFL Industry and Trade SA, Rio de Janerio, Brazil) for 30 seconds. The acid was removed with water before the total drying of surface. The surface was air-dried to remove the solvent and adhesive layer was unpolymorized. The resin cement (Variolink Veneer, Ivoclar, Vivadent) was used and was applied in the internal surface of veneers. Polymerization of resin cement was once light-cured at the facial and lingual sides for 90 seconds. The occlusion was assesed to make sure the anterior guidance.

Results

Lithium disilicate is an esthetically advantageous material for implant abutment restorations. Few prosppective data are available regarding lihium disilicate abutment outcomes for implant restorations^{2,3,5}. Thus these cases report offers a favorable indication that CAD/CAM Ti-Base lithium disilicate abutments with laminate veneers for anterior positions offer excellent servise in the short term.

This cases included implants with conical interface designs which is the shielding of the abutment screw by stressess that are distributed along the lenghened tapering interfacial contact compared with other interfaces used for internal designs. The aesthetics results were good after 1 year. No prosthetic and biologic complications were found after 1 year in case reports (Figure 9 and 10).

Conclusions

Only limited clinical data related to implant-supported lithium disilicate abutment and crowns, is presently available in the scientific litrerature^{1,3,4}. The restoration using the lithium disilicate abutment and lithium disilicate veneers has more monolithic pressed structure than the single restoraton without compromising the aesthetics. This provides a better restoration because of higher light transmission.

The use of ceramic veneers enabled a conservative and aesthetic successful rehabilitation treatment. Thus, for the clinical longevity of restorations, it is necessary to carefully follow all clinical steps.

Figure1: Initial panoramic radiograph

Figure 2: Clinical view

Figure 3: Gingiva formers were placed

Figure 5: Recontoured gingival architecture

Figure 4: Provisional restoration with a natural emergence profile

Figure 6: Lithium disilicate abutments with laminate veneers

Figure 7: Abutments was etched with 9% hydrofloric acid and lateral tooth was etched with 37% phoshoric acid

Figure 8: Panoramic radiograph 1 year later

Figure 9: Final smile photo

Figure 10: Final clinical view 1 year later

References

1. Pieger S, Salman A, Bidra AS. Clinical outcomes of lithium disilicate single crowns and partial fixed dental prostheses: a systematic review. J Prosthet Dent 2014;112:22-30.
2. Wittneben JG, Buser D, Salvi GE, Bürgin W, Hicklin S, Brägger U. Compli- cation and failure rates with implant-supported fixed dental prostheses and single crowns: a 10-year retrospective study. Clin Implant Dent Relat Res 2014;16:356-64.
3. Fabbri G, Zalone F, Dellifiorelli G, Cannistraro G, De Lorenzi M, Mosca A, et al. Clinical evaluation of 860 anterior and posterior lithium disilicate res- torations: retrospective study with a mean follow-up of 3 years and a maximum observational period of 6 years. Int J Periodontics Restorative Dent 2014;34:165-77.
4. Wittneben JG, Buser D, Salvi GE, Bürgin W, Hicklin S, Brägger U. Compli- cation and failure rates with implant-supported fixed dental prostheses and single crowns: a 10-year retrospective study. Clin Implant Dent Relat Res 2014;16:356-64.
- 5.Pieger S, Salman A, Bidra AS. Clinical outcomes of lithium disilicate single crowns and partial fixed dental prostheses: a systematic review. J Prosthet Dent 2014;112:22-30.