

Monolithic Ceramic Fixed Prosthetic Constructions In The Frontal Region

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Abstract

The most commonly used monolithic ceramics are lithium-disilicate and zirconium-dioxide ceramics. Lithium disilicate ceramics is the best choice for the reconstruction of front teeth because of the naturalness of the color and the translucency of the material. Zirconium-oxide ceramics have excellent mechanical properties and are most suitable for larger joint replacements in the area of strong dental forces. Case study of two patients. The first one has crowns made of monolithic lithium-disilicate ceramics in the frontal region, and the second patient has a crown made of monolithic translucent zirconium-dioxide ceramics. Monolithic fixed-prosthetic products successfully satisfy the patient's aesthetic and functional needs.

Keywords: monolithic ceramics lithium-disilicate zirconium-dioxide ceramics.

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I. Introduction

To satisfy high aesthetic needs in the dental region, where there is greater load of the chewing forces, monolithic ceramic replacements are being developed (1,2). These are replacements made in one unit from one type of ceramic. With them, the stratification of two-layered products is avoided and all the aesthetic advantages in relation to the metal-ceramic products are retained (3,4).

The most commonly used monolithic ceramics are lithium disilicate and zirconium oxide ceramics. Lithium-disilicate ceramics is the best choice for the reconstruction of front teeth because of the naturalness of the color and the translucency of the material (5). Zirconium-dioxide ceramics have excellent mechanical properties and are the most suitable for multi-joint replacements in the area of strong dental forces (6).

Lithium-disilicate products are made with hot air technique (the most famous is IPS e.max Press by Ivoklar) and CAD/CAM technique with the help of prefabricated ceramic blocks. The mechanical properties of lithium-dioxide ceramics (95 GPa elasticity) are similar to the elasticity of tooth enamel (90 GPa elasticity). The resistance to breaking is about 1.5 MPa/m², which is greater than the 1.0 MPa/m² enamel (7,8).

The optical properties are excellent due to the high translucency that enables the naturalness of the material and good aesthetics in the front. The selection of suitable translucency is in 4 levels: high translucency (HT), low translucency (LT), medium opacity (MO) and high opacity (HO). A monolithic crown is made, which is completely made of one material and then finished with the use of individual colors (9,10).

Zirconium-oxide monolithic ceramics have a lower level of translucency and fulfill the mechanical properties for the production of lateral fixed prosthetic constructions. Mechanical properties are far better than other ceramic and metal ceramic constructions (11,12).

II. Case Presentation

A 50-year-old female patient with a large abrasion of the central incisors. The abrasion was caused by bad habits like eating nuts, biting nails etc. The abrasion has deepened and was increased as the time passed, the defect that occurred needs to be repaired with a fixed prosthesis. Monolithic translucent lithium-disilicate crowns were made at the patient.



Figure 1: Teeth Abrasion In The Front



Figure 2: Prepared Teeth In The Front



Figure 3: Cemented Monolithic Lithium Disilicate Crowns

Another 70-year-old patient with a fractured lateral incisor came to our clinic and we made a metal-free superstructure with a fiberglass cast. And then a monolithic zirconium-oxide crown was made.



Figure 4: Making An Upgrade With Fiberglass Post On A Lateral Incision



Figure 5: Cemented Monolithic Zirconium-Oxide Crown

III. Discussion

The technological procedure for the production of monolithic prosthetic constructions is faster compared to two-layer replacements, which combine 2 different processes. The advantage of monolithic prosthetics is in the reduced removal of hard tooth tissue compared to two-layer replacements, where a larger tooth structure is removed. The use of lithium-disilicate ceramics in the frontal region is greater than the use of zirconium-dioxide ceramics because of the good translucence, good mechanical properties and good optical properties.

IV. Conclusion

The properties of dental materials are improving every day, and all this leads to ideal solutions and satisfied patients. Today, monolithic ceramic restorations are increasingly indicated for production in the frontal region and satisfy the aesthetic and functional needs of patients.

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