Use of monolithic lithium disilicate for implant abutment and crown: a clinical report

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ABSTRACT

Background Lithium disilicate is usually used for producing prosthetic crowns to be cemented on teeth or implant abutments. On the contrary, its use for producing implant abutment is not reported. This report describes the use of monolithic lithium disilicate to realize implant abutment and crown.
Case report A 60-year-old male patient required dental implant restoration for replacing the upper right central incisor. A lithium disilicate abutment and crown were realized by pressing.
Conclusion Lithium disilicate may be a valid alternative to zirconia for producing implant abutments in the esthetic area.

KEYWORD Aesthetics; Implant abutment; Lithium disilicate.

INTRODUCTION

Lithium disilicate is an all-ceramic material that combines good mechanical properties and excellent aesthetic results. This ceramic is indicated for single crowns (1), veneers and inlays (2), may be pressed or milled, and it may be produced as a monolithic restoration or veneered for a highly esthetic outcome. Many *in vitro* studies evaluated both fracture resistance and adhesion on tooth structure of disilicate crown (3-5), and they are considered a reliable treatment alternative even for posterior, high load-bearing areas (6). Lithium disilicate may also be used for single crowns cemented on titanium or zirconia implant abutments (7-9). On the contrary, lithium disilicate for producing implant abutments is not generally used. This report describes the use of monolithic lithium disilicate to realize an implant abutment and crown.

CASE REPORT

A 60-year-old male patient presented at the Prosthodontics Department of the University of Ferrara for the final restoration of a dental implant replacing the upper right central incisor (Thommen Medical). A temporary was adapted on the implant three months earlier and the peri-implant tissues were considered stabilized for finalization (Fig. 1). An impression was taken using customized coping (Fig. 2) (10).
A lithium disilicate abutment and crown (IPS e.Max Press, Ivoclar Vivadent AG) were realized by pressing (Fig. 3). The inner surface of the lithium disilicate abutment was etched by means of 5% hydrofluoridric acid (IPS Ceramic gel, Ivoclar Vivadent AG) for 20 seconds, rinsed, cleaned in pure alcohol in an ultrasonic bath for ten minutes, treated with a universal primer (Monobond Plus, Ivoclar Vivadent AG) for 60 seconds and dried with hot air. The external surface of the titanium base was sandblasted and treated with the same primer. A composite cement (Multilink Hybrid Abutment, Ivoclar Vivadent AG) was mixed onto the inner surface of the abutment and then it was seated onto the titanium base until polymerization was achieved, carefully removing all the excess. The abutment was screwed on the implant with controlled torque (Fig. 4). The screw access hole was filled with polytetrafluoroethylene (PTFE). The lithium disilicate crown was luted on abutment following the same luting procedure and a quite similar cement (Multilink Automix, Ivoclar Vivadent AG) (Fig. 5). Trans-illumination showed a natural effect (Fig. 6). The follow-up at twelve months showed the stability of the result (Fig. 7).

FIG. 1. The temporary crown screwed on the implant.

FIG. 2. The impression coping modified according to the profile of the temporary crown.

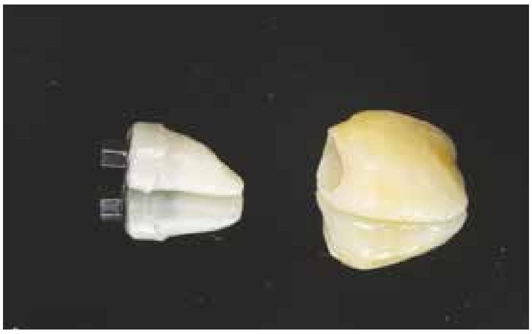

FIG. 3. The lithium disilicate abutment and crown.

FIG. 4. The lithium disilicate abutment screwed on the implant.

FIG. 5. The lithium disilicate crown luted on the abutment.

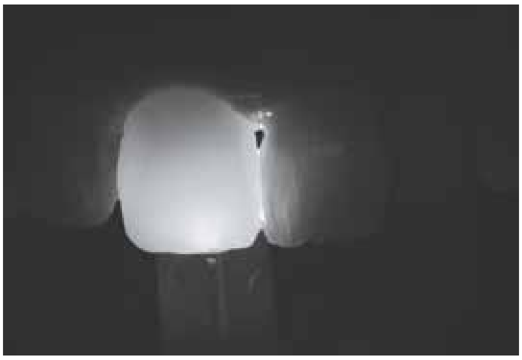

FIG. 6. The lithium disilicate crown and abutment trans-illuminated.

FIG. 7 The 12-month follow-up.

DISCUSSION

Traditionally, implant abutments can be standard or customized. Customized abutments can be produced using various materials and techniques: they can be cast by gold or other metal or they can be milled by titanium or zirconia. A customized zirconia abutment may be entirely made by zirconia (including the connection) or it may be produced by cementing a zirconia abutment on a titanium base. This latter option has the advantage of connecting titanium on titanium, avoiding coupling materials with different biomechanical properties, which can produce complications (11-13). Using lithium disilicate instead of zirconia on a titanium base presents some advantages: disilicate can be produced by both milling and pressing, being a material more versatile for the dental technician; it is more translucent than zirconia, producing a more natural final restoration; disilicate may be etched, increasing the adhesion to the composite cement used for luting. A technique to produce screw-retained implant crowns by lithium disilicate has been described (14), but the translucency of this material finds the best indication in esthetic rehabilitations.

CONCLUSIONS

In conclusion, using a lithium disilicate for producing implant abutment may be a valid alternative to zirconia in the esthetic area.

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