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Case Report

Innovative and Conservative Approaches: Inlay Retained Prosthesis and Endocrown in Dentistry

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ABSTRACT

The loss of teeth is a common issue that is often addressed in dental practice. Traditional solutions such as dental implants, and fixed partial dentures are commonly used for replacing missing teeth. For a single tooth loss, dental implants are often the preferred and most successful option. However, these procedures tend to be invasive and result in substantial loss of natural tooth structure. In cases where patients face financial constraints, alternative treatment options are considered. Resin-bonded posterior fixed dental prostheses (RBFDP) serve as a highly effective and aesthetically pleasing solution in these circumstances. Furthermore, for teeth that are significantly damaged, post-and-core followed by a crown is a common treatment option. The endocrown is a viable alternative in such situations. This case report demonstrates a minimally invasive technique involving an inlay retained posterior fixed dental prosthesis made from monolithic zirconia, as well as a lithium disilicate endocrown.

Keywords: Endocrown, Minimally invasive, Fixed prosthodontics, Endocrown, Minimally invasive, Resin-bonded fixed prosthesis, Luting

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Introduction

Partial edentulism is a widespread issue encountered in modern dental practice, and conventional fixed dental prostheses often require the removal of a considerable portion of the natural tooth structure, sometimes up to 70% of the clinical crown's mass [1]. When a single tooth is missing, dental implants are typically the most preferred and effective treatment option. However, financial limitations may lead patients to explore alternative solutions [2]. In these cases, resin-bonded posterior fixed dental prostheses (RBFDP) provide an excellent alternative, offering both effective restoration and an aesthetic outcome [3]. Endocrowns, particularly for molars that have undergone root canal treatment, offer a valuable alternative to traditional crowns. Lithium disilicate has emerged as a preferred material for these restorations [4-6].

This case report demonstrates a minimally invasive technique involving an inlay retained posterior fixed dental prosthesis made from monolithic zirconia, as well as a lithium disilicate endocrown.

Case report

A 21-year-old patient presented to the outpatient department with a primary complaint of a missing tooth

in the upper right posterior region and a dislodged metal crown in the lower right posterior area. The patient reported that the crown had come off four days earlier and expressed a desire for a metal-free prosthesis. Upon intraoral examination, it was observed that tooth number sixteen was missing, and the available mesiodistal space for replacement was limited to 5 mm. Additionally, tooth 46, which had undergone root canal treatment, displayed a chamfer margin, and secondary caries were noted on the tooth (**Figures 1-3**).

Figure 1. Pre-op maxillary arch

Figure 2. Pre-op mandibular arch

Figure 3. Pre-op occlusion of the patient

The patient was provided with various treatment options for the missing tooth 16, including fixed dental prosthesis (FDP), dental implants, and resin-bonded fixed dental prosthesis (RBFDP). However, the patient opted against implant surgery and selected the inlay-retained fixed dental prosthesis (IRFDP) for the missing tooth. Regarding tooth 46, the patient was given two alternatives: an endocrown or a traditional full-contour crown. The participant chose the endocrown for this tooth.

Preparation, scanning, and milling process

Inlay retained FDP

For the restoration of tooth 16, inlay preparations were also performed on teeth 15 and 17. The buccolingual width of the preparation was set to one-third of the intercuspal distance, and the depth of preparation was approximately 2 mm. The gingival seat area was prepared to a depth of 1.5 mm on both the second molar and premolar. To capture the impression, a putty and light-body silicone material (Dentsply, Aquasil) was used, and the impression was poured with a type IV die stone (Kalabhai, Ultrarock). The design of the inlay-retained FDP was created using CAD/CAM software (Sirona INLABSW4). The CAD/CAM process includes five stages: administration, scanning, modeling, designing, and milling.

During the administration phase, basic patient details were entered, followed by the selection of the appropriate tooth numbers. Zirconia material (in Coris TZI C, Dentsply Sirona) was chosen for the restoration. In the scanning phase, the model was scanned using Sirona INOES Blue, with CEREC optic spray (Sirona) applied beforehand to ensure optimal optical clarity. In the modeling phase, the software was used to define the axis and preparation margins for the restoration. The next step involved the software calculating the restoration, and identifying areas of excess or insufficient thickness, which were modified accordingly. Finally, milling was performed (**Figure 4**).

Figure 4. Inlay retained posterior fixed dental prosthesis made of monolithic zirconia

Endocrown

The secondary caries in tooth 46 were initially removed, and the access cavity was restored with composite resin, ensuring that the cavity walls were smoothly rounded. The chamfer margin of the tooth

was then refined, and an impression was taken using a combination of putty and light-body impression materials (Dentsply Sirona, Aquasil). These impressions were then poured with die stone. The process for designing the endocrown was similar to that of the inlay-retained FDP, with the only difference being the material choice, which was Ivoclar Vivadent IPS E max CAD Low Translucency block (shade A2). Afterward, milling was performed using the Sirona InLAB Milling system.

Treatment and luting

The Zirconia RBFDP were subjected to sintering and glazing, while the Lithium disilicate was also glazed before the trial fitting in the patient's mouth. Initially, the RBFDP was sandblasted using Cobra, Aluminium Oxide (25 μm) at a pressure of 1 bar, and then Monobond Plus (Ivoclar Vivadent) was applied for sixty seconds. The RBFDP was bonded using Multilink resin cement (Ivoclar Vivadent). The endocrown was etched with 5% hydrofluoric acid for a brief period, followed by the application of Monobond for sixty seconds, and then it was luted with Multilink resin cement.

Follow-up

The participant returned for follow-up visits at the six-month and one-year marks, during which no complications with the prosthesis were observed.

Conclusion

Monolithic Zirconia, when used as an inlay retained resin bonded FPD, presents a practical and minimally invasive solution for addressing single tooth loss. Endocrowns provide a highly effective substitute for traditional post-and-core procedures with full-contour crowns. Further long-term studies are needed on inlay retained resin bonded FPDs to establish them as a standard treatment option.

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References

1. Schwindling FS, Waldecker M, Rammelsberg P, Rues S, Bömicke W. Tooth substance removal for ceramic single crown materials—an in vitro comparison. Clin Oral Investig. 2019;23(8):3359-66.
2. Curtis DA, Lin GH, Fishman A, Sadowsky SJ, Daubert DM, Kapila Y, et al. Patient-Centered Risk Assessment in Implant Treatment Planning. Int J Oral Maxillofac Implants. 2019;34(2):506-20.
3. Kern M. Single-retainer resin-bonded fixed dental prostheses as an alternative to orthodontic space closure (and to single-tooth implants). Quintessence Int. 2018;49(10):789-98.
4. Govare N, Contrepois M. Endocrowns: A systematic review. J Prosthet Dent. 2020;123(3):411-8.
5. Kharalampos M, Put VA, Tarasenko SV, Reshetov IV. Comprehensive patient rehabilitation while performing immediate dental implant placement with the use of information-wave therapy (literature overview). J Adv Pharm Educ Res. 2020;10(2):11-4.
6. Yamany IA. The Employment of CBCT in Assessing Bone Loss around Dental Implants in Patients Receiving Mandibular Implant Supported over dentures. Int J Pharm Res Allied Sci. 2019;8(3):9-16.