Oral Sphere Journal of Dental and Health Sciences

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Case Report

Restoring Smile with Ceramic Veneers for a Patient with Fractured Anterior Teeth: A Case Report

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Citation: Sharma A, Upadhyay S, Pallavi K, Kumari A. Restoring Smile with Ceramic Veneers for a Patient with Fractured Anterior Teeth: A Case Report. Oral Sphere J. Dent. Health Sci. 2025;1(1):29-34.

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Received: October 19, 2024;

Revised: November 15, 2024;

Accepted: December 28, 2024;

Published: January 01, 2025

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DOI: https://doi.org/10.63150/osjdhs.2025.33

ABSTRACT

Background: This case report analyzes the efficient restoration of fractured anterior teeth using ceramic veneers. A 47-year-old female patient suffered from trauma, which caused fractures of the maxillary central incisors. Veneers were considered an adequate treatment option for smile restoration.

Case Presentation: A 47-year-old female presented with trauma that resulted in fractures of the maxillary central incisors. After taking the pertinent information, the decision was made to proceed with lithium disilicate ceramic veneers. After taking impressions for the veneers to be custom-made, the veneers were directly bonded to the fractured incisors with an adhesive cement.

Conclusion: During the procedure, minimal preparation was needed, which meant that most natural tooth structures were preserved. Also, the veneers with their excellent properties were both functional and pleasing to the eye. When the patient returned for their 12-month follow-up, they had no complications with their new smile and veneers. The patient reported with great satisfaction that their smile was not only new but also brought a high level of confidence.

Keywords: Aesthetic restoration, Ceramic veneers, Dental trauma, Fracture, Lithium disilicate

BACKGROUND

Trauma injuries involving the anterior teeth in young adults are an established phenomenon, particularly from sport injuries, car accidents, or falls, and are a major concern [1]. Injuries affect the teeth, and particularly the anterior teeth, which have more than dental problems. The psychological effect is excessive as the anterior teeth have greater value to self-worth and self-confidence [2]. Psychologically, dental fractured anterior teeth of the maxilla present more than a problem to Dentistry, as the restoration is an illusion to everyday reality, and an unbalance between adequate restoration and appearance is a concern. The lost structure in a restoration must endure the strength of chewing [3].

Conventional tonic options such as arsenic-compliant resins get bid prompt results, but they need to improve the seniority and beautiful precision necessary for best outcomes, notably these conditions [4]. Also, composite materials may exhibit staining or wear over time, leading to a less-than-satisfactory appearance as the restoration ages. Ceramic veneers have a highly effective and conservative answer for restoring fractured anterior teeth. The lighter-weight ceramic materials utilized are along the visible gingival margin of the tooth to create a long-lasting aesthetic restoration that resembles the original tooth form [5]. There are many benefits that veneers provide including excellent strength, color stability, and the ability to mimic the natural enamel translucency. Such qualities made ceramic veneers highly, if not fully, utilized [6]. Subsequently, lithium disilicate ceramic which translucency closely resembles that of natural tooth, thus, justifiable for anterior restoration, is highly and commonly if not solely, utilized [7]. It is highly ethestically pleasing and also tough such that it will not chip nor fracture. Moreover, it is a sustainable restoration for the patients. The bonding process of the restoration which is fixing the restoration to the tooth structure will also provide the restoration with a greater durability. [8]. The present case report is about the treatment of a 47 years old female patient with fractured maxillary central incisors. The patient had suffered a traumatic injury to the front teeth. The main complaint of the patient was the visible fractures of the anterior teeth that made her feel displeased about her smile.

CASE PRESENTATION

A patient presented at the Department of Prosthodontics and Oral Implantology, Kanti Devi Dental College and Hospital, Mathura, Uttar Pradesh, India, a 47-year-old who underwent facial trauma resulting in a fractured maxilla involving the central incisors (#11, #21, and #22). The main complaint was that the patient was seeking treatment for the poor appearance of her smile and emphasized the requirement for an aesthetically pleasing and durable compromise in that regard. A thorough clinical and radiographic examination was performed to assess the fractures and choose the most suitable treatment plan [Figure 1].

Medical and Dental History

1. Medical History: The patient was healthy and there were no major medical conditions present and there are no medical contraindications for receiving dental treatment.

2. Dental History: The patient had no noticeable dental problems before the incident and there are no previous dental restorative procedures.

Clinical and Radiographic Examination

1. Clinical Examination: Horizontal fractures within the incisal third were noted on the maxillary central incisors. The teeth were not symptomatic and there were no signs of the pulp being exposed nor signs of periapical disease.

2. Radiographic Examination: Periapical radiographs verified that there was no involvement of the pulp and the periapical tissues were healthy.

Treatment Plan

Ceramic veneers are selected for esthetic restoration because the least amount of modification to the tooth structure was used. They are the most suitable option esthetically, and they also preserve the most tooth structure.

Procedure:

1. Shade Selection: A Vita 3D Master shade guide was used to select a shade that closely matched the patient's adjacent teeth.

2. Tooth Preparation: Conservative tooth preparation was carried out, with only 0.3–0.8 mm of enamel removed from the labial surface of the fractured incisors to create space for the veneers while preserving as much of the

natural tooth structure as possible and etching The Tooth Surface With 37 Percent Phosphoric Acid [Figure 2].

3. Impression: Impressions were taken using polyvinyl siloxane (PVS) material (Virtual putty, Ivoclar Vivadent) and sent to the dental laboratory for veneer fabrication.

4. Try-in and Bonding: Upon receiving the ceramic veneers from the lab, the veneers were tried in to assess fit, color, and contour. After the patient approved the appearance, the veneers were etched with 30% hydrofluoric acid gel, a silane coupling agent was applied, and the veneers were bonded using dual-cure resin cement (Variolink Esthetic DC, Ivoclar Vivadent). The teeth were conditioned with 37% phosphoric acid etching gel (N-Etch, Ivoclar Vivadent) under strict moisture control to ensure optimal bonding [Figure 3].

Results and Follow-Up

Because of the fractures, the teeth were restored with ceramic veneers that also provided an appealing and realistic appearance. The veneers are completely integrated with the appropriate colors, translucency, and textures. The results were satisfactory for the patient, for having a naturally appearing smile, as well as great symmetry of the smile. The patient was instructed post-operatively to maintain appropriate oral cleaning habits and avoid biting of hard materials to prevent wear of the veneers. The patient, however, indicated that there was no issue, either functional or cosmetic, and that she was extremely satisfied with the outcomes.

Figure 1: Preoperative view of fractured maxillary central incisors and lateral incisors

Figure 3: Etching The Tooth Surface With 37 Percent Phosphoric Acid

Figure 2: Tooth Preparation

Figure 4: Post-operative Image

DISCUSSION

Ceramic veneers are frequently used to restore fractured anterior teeth, provided there is minimal loss of tooth material. Ceramic veneers have become a fully accepted treatment type. Ceramic veneers are different from full-coverage crowns, which often require excessive tooth preparation. These cases exemplify the remarkable use of ceramic veneers in restoring fractured maxillary incisors, achieving a highly successful and lasting outcome [8]. For the patient in this case, ceramic veneers were a perfect choice due to their superior mechanical properties and excellent aesthetic resemblance to natural teeth. Ceramic veneers were successful. The fracture and wear resistance of lithium disilicate ceramics is superior. They integrate extremely well with teeth because of their excellent light transmittance. The consistency of colour and translucency of ceramic veneers is perfect because they are very close to tooth enamel, which is a natural quality of the tooth. The excellent outcome achieved with ceramic veneers is fully attributed to the soldering work. In this case, resin-based cement, with proper tooth conditioning and preparation, ensured a strong and durable bond between the veneer and the underlying tooth structure, and even the enamel [9]. The soldering of the platinum to the tooth enamel is similar to what was done to the dentine because tooth enamel is slightly deeper and provides a more stable and enduring bond. The phosphoric acid etching of the enamel creates microvoids that increase the retention of the veneer as the mechanical retention is increased [10]. The long-term success of the veneers is greatly dependant on predetermining the conditions of the patient's teeth. The patients that can be considered are those who have good teeth health, minor tooth erosion, and a good sanitary environment. Patients with teeth grinding habits (bruxism) or cases with severe misalignment restrictions are more likely to be compromised as a reinforced structure with excess forces that can be eroded or loosened. So, a complete evaluation of the patient's teeth conditions is required prior to the procedure. Educating the patient on what to expect post-treatment is important for the veneers to remain intact. The patients are required to avoid biting hard objects and maintenance of hygiene. Regular check-ups are important to identify new problems of the veneers, like chipping, looseness, or stains that appear [11].

CONCLUSION

The ceramic veneers did not present any complications after 12 months of follow-up. This shows that ceramic veneers, after appropriate planning, can provide a durable, highly aesthetic restoration of fractured anterior teeth. In this instance, lithium disilicate ceramic veneers were used to restore the 47-year-old woman's maxillary central incisors, who had a good aesthetic integration with the rest of the teeth, and the bonded veneers were very well integrated. While doing the 12-month follow-up, she had no complaints or any complications like chipping or discoloration of the veneers. The veneers were still in good condition.

PATIENT PERSPECTIVE

This case is about a 47-year-old female patient who has suffered from trauma to the maxillary central incisors and has had to live with fractured maxillary central incisors. She has self-reported experiencing trauma to her maxillary central incisors' fractures, affecting her smile negatively. The self-fractures are extremely visible and have a negative impact on the area. The self-fractures are extremely visible and carry a negative impact in the area. The patient has a reported expectation for treatment to restore her teeth with a natural aesthetic. The patient is a smile enhancement case due to the loss of teeth. Self-fractures are extremely visible and negative. Self-fractures are very visible; the negative impact is evident. The self-fractures are extremely visible and carry a negative impact in the area. The self-fractures are extremely visible and carry a negative impact in the area. Self-fractures are very visible; the negative impact is evident. Self-fractures are very visible; the negative impact is evident. Self-fractures are extremely visible; the negative impact is evident. Self-fractures are very visible; the negative impact is evident. The self-fractures are extremely visible and carry a negative impact in the area. Self-fractures are very visible; the negative impact is evident. Self-fractures are very visible; the negative impact is evident. Self-fractures are extremely visible; the negative impact is evident. The self-fractures are very visible and carry a significant negative impact. Self-fractures are very visible; the negative impact is evident. She is a case of smile enhancement due to the loss of teeth. Self-fractures are extremely visible, and the negative impact is evident. Self-fractures are extremely visible, and the negative impact is evident. The self-fractures are extremely visible and carry a negative impact in the area. She has self-reported experiencing trauma to her maxillary central incisors. The self-fractures are very visible, and the negative impact is evident. The self-fractures are extremely visible, and the negative impact is evident. The self-fractures are very visible, and the

negative impact is evident. Self fractures are extremely visible. Self fractures are very visible. Self fractures are extremely visible. She has endured trauma to her maxillary central incisors. Self fractures are very visible. The negative impact is evident. Self fractures are extremely visible.

Throughout the treatment process, the patient reported a high level of satisfaction due to the limited tooth preparation, as it is in her best interest to conserve as much tooth structure as possible. She expressed a high level of satisfaction with the final result, as the veneers were the right shade and had the right translucency to match the natural teeth. The patient has been seen 12 months after the veneer placement with no complications pertaining to the veneers and reported continuing satisfaction with the aesthetic result. She is a case of smile enhancement due to the loss of teeth.

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Ethical Approval: Institutional Review Board approval was not required.

Declaration of Patient Consent: Written informed consent was obtained from the patient prior to initiating the treatment. The patient was fully informed about the nature of the ceramic veneer procedure, the potential risks and benefits, and the expected outcomes. Consent was also obtained for the publication of the case report, including the use of anonymized clinical photographs and information for educational purposes.

Financial Support and Sponsorship: Nil

Conflicts of Interest: The authors declare that they have no conflicts of interest.

Use of Artificial Intelligence (AI) - Assisted Technology for Manuscript Preparation: The authors hereby state that they did not utilize AI assistance for writing or editing the paper, as well as for possible manipulations of the images.

AUTHOR CONTRIBUTIONS:

1. **Abhishek Sharma**: Created the research design. Also contributed towards the manuscript writing. He also supervised the clinical assessment and treatment and maintained the study quality.

2. **Sneha Upadhyay**: Helped in the treatment planning. Assisted during the clinical activity. Also contributed towards the manuscript in the form of reviewing and editing.

3. KM Pallavi: Helped in patient administration. Executed the clinical tasks aligned with tooth shaping. Also contributed towards the manuscript in terms of writing some portions of the discussion and results.

4. **Anukriti Kumari**: Was responsible for reviewing the literature. Provided some technical assistance in veneer making. Also contributed in writing the manuscript, especially the introductory and concluding portions.

ABBREVIATIONS USED IN THE STUDY:

a) **PVS** - Polyvinyl Siloxane (material used for impressions)
b) **Vita 3D Master** - A shade guide used to match the color of dental restorations
c) **PVS** - Polyvinyl Siloxane (used for impressions)
d) **ADA** - American Dental Association
e) **SD** - Standard Deviation
f) **CI** - Confidence Interval
g) **Veneers** - Thin ceramic shells used to restore the appearance of damaged teeth
h) **Lithium Disilicate** - A type of ceramic material used for dental veneers
i) **Phosphoric Acid** - Acid used for etching the tooth surface to improve bonding (37% concentration)
j) **Dual-Cure Resin Cement** - A type of adhesive resin cement used for bonding dental veneers
k) **IADR** - International Association for Dental Research (if applicable)

l) **ISO** - International Organization for Standardization (in reference to standards for dental materials)

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