# Long-term success of feldspathic ceramic veneers in restoring incisal edge defects


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*Received: 02 July 2024; Accepted: 14 August 2024; Published: 30 September 2024*

## Abstract

This case report describes the successful use of feldspathic ceramic veneers to restore incisal edge defects in a patient with significant enamel loss. The patient presented with damage to teeth 1.1 and 2.1, primarily due to habitual consumption of hard foods and improper brushing techniques. Feldspathic ceramics were selected for their superior aesthetic qualities and were bonded using advanced adhesive techniques. Over a period of seven years, the veneers maintained their shape, color, and function, demonstrating the material's durability and aesthetic stability. This case underscores the importance of proper material selection, careful preparation, and precise bonding in achieving long-term success with feldspathic ceramic veneers. Despite the challenges associated with the brittleness of feldspathic ceramics, this case highlights their effectiveness in restoring both the aesthetic and functional aspects of compromised dental structures.

**Keywords:** Feldspathic ceramics, Incisal edge restoration, Aesthetic dental restoration

## INTRODUCTION

In restorative dentistry, feldspathic ceramic veneers have been recently a method of choice owing to their aesthetical and biocompatibility benefits [1,2]. The reduction of hard dental tissue at the incisal edges especially due to triangular lines demand effective treatments that help regain both the prosthetic and cosmetic form of the affected teeth [3]. In this regard, the teeth 1. 1 and 2. 1 which had been severely damaged was repaired with feldspathic ceramic veneer [4,5]. This approach not only mimics the anatomy of the teeth but also plays a role in correct positioning of the incisal surfaces, which is very important in the longevity of the restorations [6]. Moreover, feldspathic ceramic because of the opacity and stiffness of the material enables the veneers to be seamlessly infused into the existing dentition especially in the aesthetic territory of the dental arch [7]. Therefore, the anatomical and esthetic reconstruction of teeth 1. 1 and 2. 1 by applying feldspathic ceramic veneers mean the best solution for all the patients who want to have the most esthetic and long-term results [8,9]. Therefore, this study aims to determine the factors involving selection of proper material and proper adhesive methodology to get the best results in aesthetic dental restorations [10,11].

### *Aim and objectives*

The objective of this study was to restore the incisal edges of the maxillary central incisors, which were affected by triangular abrasion defects, using feldspathic ceramic veneers. This article aims to evaluate the aesthetic and functional outcomes of feldspathic veneers in restoring these specific defects. Additionally, it explores the durability and stability of these veneers over time, as well as the impact of modern bonding techniques on their wear resistance. The study further discusses the significance of feldspathic ceramics in contemporary restorative dentistry, particularly in challenging clinical scenarios.

## MATERIAL AND METHODS

A female patient has considerable enamel wear in the incisal edges of teeth 1. 1 and 2. 1 attributable to triangular cracks. To reconstruct these teeth, feldspathic ceramic veneering material were selected for their optimal esthetic characterization exhibiting the properties of natural teeth as for their transparency and color [11,12]. First the treating clinician had to perform a clinical assessment to analyze the severity of the situation. The remaining enamels' structural status was assessed by using a periodontal probe where measurements of the space that can hold the veneer were made and compared to the amount of enamel remaining. The verification was done, and it was ascertained that unsupported enamel at the fractured sites was less than 2mm, therefore, feldspathic ceramic veneers can be used for restoration [13,14]. In terms of preparations of the teeth, it was characterized by slight gingival divergence with reduction of the enamel at the incisal edges to offer a flat surface for the bonding procedure. A rubber dam was applied in order to keep the field separate and dry this is important especially due to the fact that any form of contamination during bonding is highly discouraged [15]. Proper fit was achieved after the first try-in where adjustments were made with the purpose of achieving the most aesthetically pleasing result [16]. Before cementation, the veneers were treated with Porcelain Etch (Ultradent, USA) containing hydrofluoric acid to produce micro-retentions on the bonding side, and the teeth were treated with Etch-Rite (Pulpdent, USA), a 37% phosphoric acid gel. Panavia SA Cement (Kuraray Noritake, Japan), a self-cured BCA cement, was used to bond the tooth surfaces and veneers. Finally, Variolink Esthetic LC Neutral (Ivoclar Vivadent, Liechtenstein) was utilized to cement the veneers [17].

These veneers were well placed, and after the cementation, the extra cement was reduced before the light-curing to enhance the bonding. The finishing was accomplished employing diamond burs (Red Band; Komet Dental, Germany) in order to harmonise the veneers with the residual tooth structures [18]. Then, using Enhance (Dentsply Sirona, USA) rubber polish discs and a Shofu Super Snap polishing brush (Shofu Dental, Japan), the restoration was polished until they were smooth with slightly glossy natural color [19]. Contrary to the selective inclusion and adhesive protocol, uniform shade correlation between feldspathic veneers with neighbouring teeth was an issue with slight but tolerable colour difference which is only discerned by hypercritical patients [20].

Figure 1. Appearance of Teeth 1.1 and 2.1 in the Frontal Extraoral View

Figure 2. Appearance of the Incisal Edges of Teeth 1.1 and 2.1 in the Oral Norm, Showing the Triangular Hard Dental Tissue Losses at the Incisal Edges of the Two Maxillary Central Incisors

a)

b)

Figure 3. a) Checkup of Restorations with Glycerin: Tetric N-Ceram by Ivoclar Vivadent; b) Checkup of Restorations with a Neutral Glycerin-Based Solution

Figure 4. Final Appearance After One-Year Reassessment

## RESULTS

Feldspathic ceramic veneers that were cemented to the: 1. 1 and 2. 1 in 2017 that demonstrated excellent wear resistance and material color stability during 7 years after the treatments in 27-year-old female patient. The veneers effectively masked the defects that have occurred due to the patient's habit that includes the consumption of hard foods like seeds and incorrectly brushing them along with the worn-out incisal edges. Even at this time, the veneers have not changed their color and form and one can tell that they are very strong and cannot be easily degraded. Apart from esthetic outcome, the restoration of incisal edges has been shown to afford long term functional stability. It was not possible to observe detachment, fractures or severe wear of veneers and this apparently shows that the material and the technique used in this case were successful. Explicit on the esthetic aspect, the dentition has remained well-coordinated with the patient pointing at the enduring harmony with her natural dentition of the veneers. Their long-term survival proves the viability of feldspathic ceramic veneers as an aesthetic as well as restorative material in the clinical practice.

## DISCUSSIONS

In this case, the longevity of feldspathic ceramic veneers used to reconstruct the incisal edges of teeth 1.1 and 2.1 highlights the practical benefits of the material, demonstrating how it can create restorations that are both aesthetically pleasing and functional over an extended period.

That the veneers have remained coloured, shaped and stable since March 2017 confirms that feldspathic ceramics can sustain the aesthetic morphology of the teeth even in suboptimal conditions [21, 22]. It was seen that the major cause of the deterioration of the enamel was the regular intake of hard foods like seeds and not proper brushing of teeth. The successful rehabilitation of these defects with feldspathic veneers implies that these ceramics are capable of coping with the mechanical demands of such habits if durable adhesive approaches are adopted [23]. In this respect, it is vital that agents such as the Variolink Aesthetic Light Cure Neutral used in the case act as bonding agents that help in providing mechanical interlock and long-term stability of the veneered surfaces. Thus, the favorable micromechanical bond between the enamel and the feldspathic ceramic because of the bonding agent played a major role in the long-term performance of the restoration [24,25].

However, the present case underscores the need to practice the right case selection and preparation while using feldspathic ceramics. The veneers were able to recreate the actual form of the incisal edges conserving the esthetic continuity with the neighbouring dental tissues offering a functional and esthetical solution. This finding is in tandem with other studies that have shown that it is possible to achieve successful outcomes with feldspathic ceramics even when there is some deviation from conventional preparation procedures, as along as adhesive dentistry principles are strictly observed [26, 27].

At the same time, this case also illustrates some of the inherent disadvantages to feldspathic ceramics. Veneers worked so well over seven years only because of the quality and conditions on their bases. Feldspathic ceramics are relatively brittle and low tensile properties, which make them prone to fracture over time if poorly supported by the existing tooth structure [28]. The nature of the enamel, along with a highly ideal preparation design, is what achieved this outcome. This adds to the growing evidence that feldspathic veneers can be a proficient tool in order to restore minor tooth structure defects, due their similar wear characteristics with human enamel. On the other hand, in order to achieve adequate and optimal aesthetic as well functional outcomes it must be considered both characteristics of

material itself plus morphologic variations depending on remaining tooth substrate structure also, techniques utilized during preparation approaches or bonding [29, 30].

Finally, this case highlights the need for a careful treatment planning of restorative methods and materials to improve long-term efficacy and resulting aesthetics in ceramic restorations. The case illustrated here also had a successful outcome from which it may be concluded that with an appropriate planning, using high quality material and carrying out highly controlled technique feldspathic veneers can also have success in demanding clinical situations [31].

## CONCLUSIONS

The long-term positive outcome of the feldspathic ceramic veneers places them as effective aesthetic and functional dental restoration modality. For seven years, it has been shown that such veneers are rather durable and do not break color or collapse even with oil-rich diets used by the patient and improper brushing. This case demonstrates the need to select appropriate cases, prepare the necessary materials, and apply correct adhesive procedures that will help maintain the feldspathic ceramic restorations for as long as possible. In their practice, feldspathic veneers provide a dependable, cosmetic answer and can be utilised where there is serious damage to the dentition. Consequently, feldspathic ceramics stand as viable candidates in restorative dentistry and the outcomes they promise are long-lasting and functional as well as also catering to the aesthetic needs of the patients.

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