

AESTHETIC REHABILITATION USING NON-PREPARATORY FELDSPATHIC VENEERS AFTER ORTHODONTIC TREATMENT: A CASE REPORT

ЕСТЕТСКА РЕХАБИЛИТАЦИЈА СО ФЕЛДСПАТ ФАСЕТИ БЕЗ ПРЕПАРАЦИЈА НА ЗАБИ ПО ОРТОДОНТСКА ТЕРАПИЈА: ПРИКАЗ НА СЛУЧАЈ

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Abstract

Introduction: Feldspathic porcelain veneers have emerged as a premier aesthetic material for custom veneer restorations due to their superior translucency, natural optical properties, and ability to be fabricated in ultra-thin layers (≤ 0.3 mm). These characteristics allow a minimally invasive approach that preserves natural tooth structure while achieving highly aesthetic results. Advances in adhesive dentistry and ceramists' techniques have further improved the predictability and longevity of these restorations, making them a preferred choice for anterior aesthetic rehabilitation. **Case Report:** A 25-year-old female presented with microdontia and multiple diastemas in the intercanine regions of both the maxilla and mandible, resulting in unbalanced anterior tooth proportions and an aesthetic concern. Orthodontic treatment was performed over nine months, followed by a two-month retention period, to align teeth and optimize spacing. After orthodontic alignment, minimal enamel finishing was performed, and feldspathic veneers were fabricated and bonded using a standardized adhesive protocol. The final restorations successfully closed the diastemas, improved tooth proportions, and restored harmonious anterior aesthetics and occlusion. **Discussion:** Careful case selection is critical when deciding between non-prep and conventional veneers. In this case, orthodontic alignment created optimal conditions for non-prep feldspathic veneers, allowing minimal tooth reduction while achieving predictable bonding and functional stability. The success of feldspathic veneers relies on the combination of preserved enamel, precise adhesive technique, and the ceramist's skill in reproducing natural translucency and morphology. **Conclusion:** Feldspathic veneers can provide highly aesthetic, conservative, and predictable results when clinical conditions are appropriate. In selected cases, integration with orthodontic therapy enhances treatment outcomes, offering a reliable long-term solution for anterior aesthetic rehabilitation while preserving natural tooth structure. **Key words:** feldspathic veneers, orthodontic therapy, microdontia, diastemas.

Апстракт

Вовед: Фелдспат порцеланските фасети претставуваат врвен естетски материјал за индивидуализирани реставрации, благодарение на нивната супериорна прозирност, природни оптички својства и на можноста за изработка во ултратени слоеви ($\leq 0,3$ mm). Овие карактеристики овозможуваат минимално инвазивен пристап со максимално зачувување на природната структура на забот, при што се постигнуваат високоестетски резултати. Напредокот во адхезивната стоматологија и современите техники дополнително ја зголемија предвидливоста и долговечноста на овие реставрации, што ги позиционира како материјал од прв избор при естетска рехабилитација на предните заби. **Приказ на случај:** Пациентка на возраст од 25 години се јави со микродонција и дијастеми во интерканинската регија на горната и долната вилица, со нарушени пропорции на предните заби и изразено естетско незадоволство. Спроведена е ортодонтска терапија во времетраење од девет месеци, проследена со двомесечен период на ретенција, со цел задржување на правилната позиција на предните заби. По завршување на ортодонтската терапија, извршено е минимално зарамнување на глеѓта, а потоа беа изработени и адхезивно цементираните фелдспат фасети согласно со стандарден протокол за цементирање. Финалните реставрации овозможиле целосно затворање на дијастемите, постигнување на правилни пропорции и воспоставување хармонична естетика и оклузија на предниот сегмент. **Дискусија:** Прецизниот избор на клинички случај е суштински при одлучување меѓу фасети без препарација и без конвенционални фасети. Во прикажаниот случај, ортодонтската терапија создаде оптимални услови за изработка на фелдспатни фасети без препарација, целосно сочувување на тврдото забно ткиво, предвидлива адхезија и стабилна функција. Успехот на фелдспатните фасети зависи од комбинацијата на зачувана глеѓ, од прецизната адхезивна техника и од умешноста на забниот техничар да ја репродуцира природната транспарентност, текстура и морфологија на забот. **Заклучок:** Фелдспатните фасети претставуваат високоестетско, конзервативно и предвидливо решение, при соодветни клинички услови. Во селектирани случаи, комбинирањето со ортодонтска терапија може значително да го подобри естетскиот и функционалниот исход, овозможувајќи сигурна и долготрајна рехабилитација на предните заби со зачувување на природната забна структура. **Клучни зборови:** фелдспат, фелдспатни фасети, ортодонтска терапија, микродонција, дијастеми.

Introduction

Since their introduction in the early 1980s, porcelain laminate veneers have become one of the most reliable treatment modalities in restorative and aesthetic dentistry due to their ability to replicate a natural appearance, longevity, strength, and high success rates¹. Porcelain laminate veneers of minimal thickness provide satisfactory aesthetic results and biocompatibility². Initially regarded as thin coverings for anterior teeth to improve appearance, their indications have expanded significantly, encompassing a broader range of restorative challenges such as closing diastemas, correcting tooth shape, and enhancing smile aesthetics. These advances have been supported by improvements in adhesive dentistry, ceramic technology, and a better understanding of occlusal principles, allowing veneers to become a versatile and predictable treatment option.

Feldspathic porcelain veneers, produced through a meticulous layering and firing process of glass-based ceramics, offer exceptional optical properties, including translucency, fluorescence, and natural light transmission, closely mimicking the optical characteristics of enamel. The layering technique allows ceramists to create restorations with depth, lifelike color gradation, and fine internal characterization, resulting in highly natural outcomes. This material allows for the fabrication of thin veneers, often below 0.5 mm in thickness, on refractory dies, ensuring high translucency and exceptional aesthetic integration³. Modern fabrication techniques also permit ultrathin restorations, sometimes as thin as 0.3 mm, allowing the preservation of the underlying tooth structure while achieving excellent aesthetic integration. This combination of minimal invasiveness and superior aesthetics has contributed to a renewed interest in feldspathic veneers, particularly among patients seeking conservative, high-quality smile enhancement.

Despite these advantages, feldspathic porcelain remains a relatively fragile material compared to other ceramic systems, making case selection, enamel preservation, and precise adhesive protocols critical to success. Feldspathic porcelains are intrinsically fragile but may obtain additional strengthening when cemented to the dental structure using resin-based luting agents. Feldspathic porcelain veneers thinner than 1 mm can be adhesively bonded to tooth tissues and present high clinical survival, with the adhesive cementation playing an important role in the clinical performance of these restorations⁴. In addition, the skill and artistry of the dental ceramist play a pivotal role, as the aesthetic quality of the final restoration depends on the ability to reproduce natural translucency, depth, and surface texture. Interdisciplinary treatment planning, including orthodontics when necessary, can further

enhance outcomes by optimizing tooth position and spacing before restorative intervention.

In this report, we present the case of a young patient with small teeth and multiple anterior diastemas, managed through a combination of orthodontic treatment and feldspathic veneers. This approach allowed for conservative preparation, optimal aesthetic results, and functional harmony, illustrating the potential of minimally invasive, high-aesthetic restorative dentistry when guided by careful planning and collaboration between the clinician and the ceramist.

Case Report

A 25-year-old female presented to the clinic with a chief complaint of dissatisfaction with her smile, specifically citing the spacing between her anterior teeth in both the maxilla and mandible. On initial clinical examination, the most prominent finding was a pronounced midline diastema between the maxillary central incisors. Additional disproportionate spacing was observed among the remaining anterior teeth, resulting in unbalanced dental and smile aesthetics.

After a comprehensive evaluation and discussion of treatment options, an interdisciplinary approach was chosen. The primary treatment objective was to close the anterior diastemas and improve tooth proportions while preserving as much natural tooth structure as possible. Orthodontic alignment was considered a prerequisite to optimize spacing and reduce the need for aggressive tooth preparation (Figure 1).



Figure 1. Post-orthodontic treatment result

Orthodontic therapy was carried out using fixed appliances over a period of nine months. A retention period of two months followed, during which a removable retainer was worn to stabilize the achieved results. Once satisfactory alignment was confirmed, the patient transitioned to the prosthetic phase.

In preparation for veneers, only minimal enamel modification was performed. Sharp incisal edges and irregular

surfaces were lightly smoothed using fine-grit red diamond burs (cylindrical shape, size 014, Acurata) and polishing discs. The objective was to maximize enamel preservation to ensure optimal bonding conditions, particularly at the margins. An analog impression was made using A- silicones (medium and light body- Kulzer). An interim removable orthodontic retainer was provided during the laboratory phase to maintain tooth position until definitive restoration.

The veneers were fabricated from feldspathic porcelain using the conventional layering technique, selected

for its superior aesthetic properties and ability to replicate the translucency of natural enamel (Figure 2 a, b).

Prior to cementation, both the teeth and the restorations underwent standardized adhesive protocols. The enamel surfaces were cleaned and etched with 37% orthophosphoric acid, followed by application of a universal bonding agent (3M Single Bond Universal). The internal surfaces of the veneers were cleaned with alcohol and chlorhexidine, etched with 10% hydrofluoric acid for 60 seconds, rinsed thoroughly, and treated with a silane coupling agent for 20 seconds (Figure 3). A thin layer of adhesive was then applied to the internal surfaces to enhance micromechanical and chemical bonding.

For cementation, VariolinkAesthetic Light (Ivoclar Vivadent), a light-cured resin cement specifically developed for thin, highly aesthetic veneers, was selected. Each veneer was carefully positioned, and adjacent teeth were isolated with Teflon tape to prevent accidental bonding. An initial light cure of 3 seconds was performed to achieve a gel state, enabling easy removal of excess resin. Final polymerization was then completed with 20 seconds of light exposure per surface, ensuring thorough curing. Residual cement was meticulously removed, and margins were polished to achieve a seamless integration with the natural dentition.

Following cementation, the patient was provided with both fixed and removable retainers to maintain orthodontic and prosthetic stability. The final outcome achieved closure of the diastemas, enhanced proportionality of the anterior teeth, and established a harmonious smile line.

At the two-week follow-up, the patient reported high satisfaction with both aesthetic and functional outcomes,

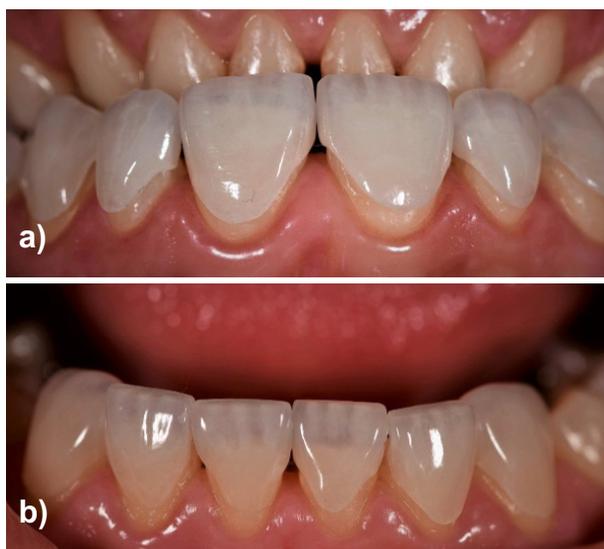


Figure 2. Try-in of the final feldspathic porcelain veneers: (a) on the maxillary teeth; (b) on the mandibular teeth.

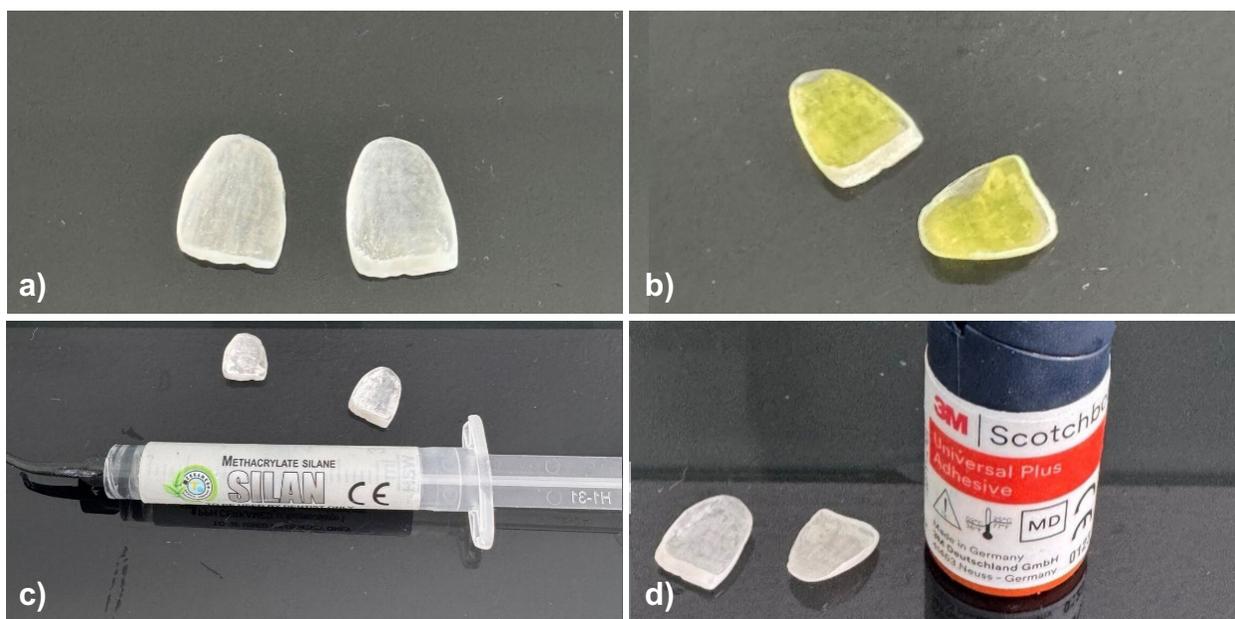


Figure 3. Preparation for cementation: (a) internal surface; (b) etching; (c) adding silane; (d) bonding agent

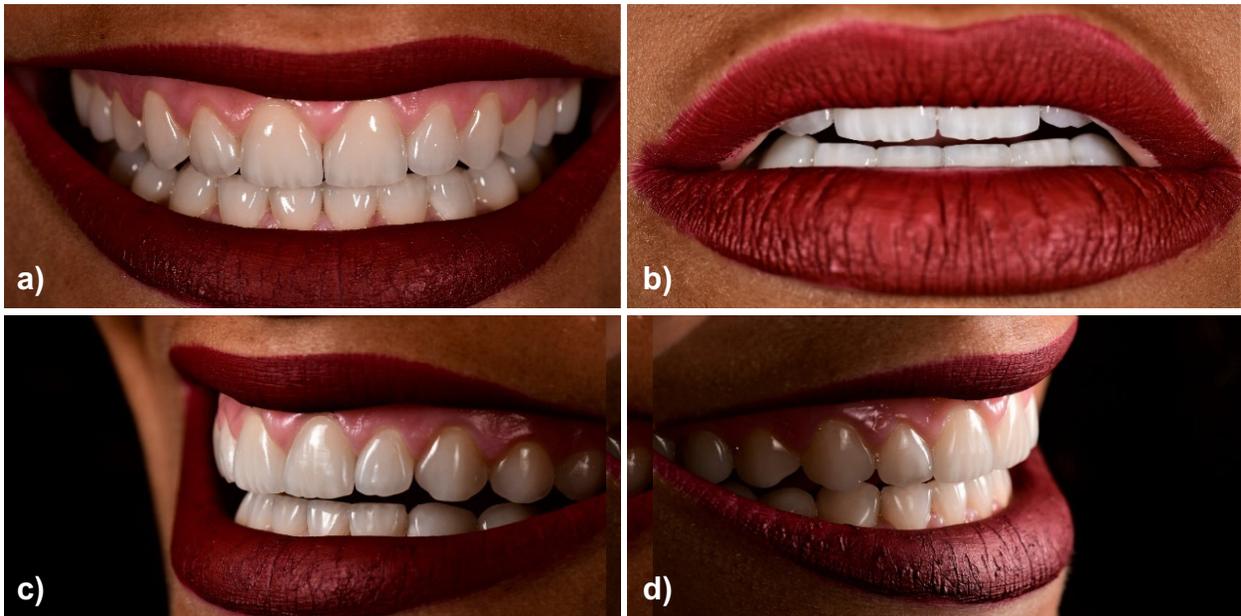


Figure 4. Final aesthetic outcome following orthodontic treatment and feldspathic porcelain veneers: (a) frontal view with full smile; (b) frontal view with lips slightly parted; (c) left lateral view; (d) right lateral view.

noting a significant improvement in self-confidence when smiling and speaking. The restorations blended seamlessly with the natural dentition, demonstrating excellent color match and surface gloss. At subsequent recalls, the veneers remained intact, with no evidence of marginal discoloration, debonding, or gingival irritation.

This case demonstrates the effectiveness of a multidisciplinary approach in managing anterior spacing, where orthodontic treatment followed by feldspathic porcelain veneers allowed for minimally invasive, highly aesthetic, and durable results (Figure 4).

Discussion

Feldspathic porcelain materials remain among the most aesthetic and widely used dental ceramics⁵. Their composition and microstructure account for their unique optical properties and clinical behavior. Feldspathic porcelain is produced by layering glass-based (silicon dioxide) powder and liquid materials. Silicon dioxide, also referred to as silica or quartz, often contains varying of alumina. In nature, these aluminum silicates may also incorporate potassium and sodium, forming feldspars. The dental porcelains derived from feldspars typically contain 60–64% silicon oxide and 20–23%⁶ aluminum oxide, which are modified to create glass matrices suitable for dental restorations. Within this glassy matrix, fluorapatite crystals are dispersed, contributing to the material's translucency, fluorescence, and overall ability to mimic natural enamel. The layering and firing process allows ceramists to develop veneers with

exceptional optical integration, making feldspathic porcelain the benchmark for highly aesthetic restorations.

Over the last four decades, feldspathic veneers have undergone a considerable evolution. Initially regarded as thin shells to improve anterior aesthetics, they are now applied in more complex rehabilitations, provided that careful case selection and preparation principles are respected. Modern adhesive dentistry has renewed interest in feldspathic veneers, particularly with the growing demand for minimally invasive procedures. Patients increasingly request treatments that combine natural aesthetics with maximal preservation of tooth structure, driving a resurgence in the use of ultra-thin feldspathic veneers, sometimes as thin as 0.3 mm. Advances in adhesive systems and luting cements have enhanced the bonding predictability, allowing long-term stability even in veneers fabricated at minimal thicknesses.

Despite these advantages, feldspathic porcelain is considered the most delicate ceramic material, particularly in terms of flexural strength and fracture resistance. This fragility underscores the importance of strict adherence to evidence-based protocols for preparation, bonding, and occlusal management. The amount of preserved enamel layer plays a paramount role in the survival and success rates of veneers, and glass-ceramic veneers with minimal or no preparation have been shown to exhibit the highest survival rates⁷. The literature emphasizes that at least 50% of the bonding surface should consist of enamel, and ideally 70% of the veneer margin should terminate in enamel. Bonding to enamel ensures a stronger and more durable

adhesive interface compared to dentin, reducing the risk of debonding or fracture. Preserving critical anatomical structures, such as the cingulum and lingual marginal ridges, is equally essential, as these provide more than 80% of the natural tooth's strength.

Space requirements also represent a significant consideration in treatment planning. When creating a feldspathic porcelain veneer, it is necessary to realize that the space required for shade change ranges from 0.2 mm to 0.3 mm per shade⁸. Insufficient space compromises aesthetics by limiting the ceramist's ability to build depth and translucency into the restoration, while over-reduction undermines the conservative philosophy that makes veneers so desirable. In the present case, the combination of orthodontic alignment and conservative veneer placement create adequate space and optimal tooth positioning to achieve the desired aesthetic result without aggressive tooth preparation.

Mechanical risk assessment is another critical factor. Flexural risk increases significantly when bonding to dentin, as dentin is more flexible than enamel. Teeth with pre-existing craze lines, deep overbites, or heavy occlusal loads are particularly susceptible to flexure, which may compromise the integrity of feldspathic porcelain. Similarly, restorations placed in distal regions are exposed to higher tensile and shear stresses due to functional loading, making feldspathic porcelain a less favorable option for molars. Bruxism and other parafunctional habits further elevate the risk of fracture or debonding, and in such cases, pressed or CAD/CAM-milled glass ceramics with higher strength may represent more appropriate alternatives. Magne et al. reported that the success rate of veneers is reduced to approximately 60% in patients with bruxism activity⁹.

Another aspect that influences success is the artistry of the dental ceramist. Feldspathic veneers are traditionally built up using the powder/liquid layering technique, which requires high levels of manual skill and experience. Unfortunately, many modern training programs place less emphasis on this craft, leading to a decline in the number of ceramists proficient in fabricating thin, lifelike feldspathic veneers. The aesthetic excellence of feldspathic restorations depends heavily on the ceramist's ability to create depth of color, internal effects, and translucency. This artistic contribution is as critical as the clinical steps performed by the dentist.

In addition to aesthetics, bonding protocols remain central to clinical longevity. Every stage, from isolation to adhesive selection and light curing, plays a role in ensuring long-term adhesion and marginal integrity. Failures in bonding or seal integrity can quickly lead to restoration loss, marginal discoloration, or secondary caries. For this reason, strict adherence to adhesive protocols-including

appropriate acid etching, silanization, use of compatible bonding agents, and careful light-curing sequences-is non-negotiable.

The present case illustrates many of these principles. Orthodontic treatment was first undertaken to optimize spacing and alignment, reducing the need for invasive preparation. Feldspathic veneers were then chosen to close the diastemas, improve tooth proportions, and enhance overall aesthetics. Minimal finishing was performed to preserve enamel, creating an ideal substrate for bonding. The cementation was carried out using a meticulous adhesive protocol, ensuring predictable adhesion and long-term stability. The outcome not only achieved harmonious aesthetics and function but also fulfilled the patient's desire for a minimally invasive solution.

In summary, feldspathic veneers represent the pinnacle of aesthetic restorative dentistry when used under the right clinical conditions. Their advantages, superior translucency, lifelike optical properties, and conservative preparation, make them ideal for anterior aesthetic rehabilitations, particularly in young patients with high aesthetic expectations. However, their inherent fragility requires thorough biomechanical assessment, careful patient selection, and precise bonding protocols. Furthermore, the collaboration between dentist and ceramist remains essential in achieving optimal outcomes. In cases like the one presented, where orthodontics, conservative preparation, and adhesive techniques are integrated, feldspathic veneers can provide long-term functional and aesthetic success.

Conclusion

No-prep and minimally invasive feldspathic veneers offer highly aesthetic, conservative solutions for anterior restorations, but require careful case selection, precise adhesive protocols, and close collaboration between clinician and ceramist. When adequate enamel remains and functional stress is low, these veneers provide excellent translucency and predictable outcomes. In this case, orthodontic alignment combined with feldspathic veneers successfully closed diastemas, improved tooth proportions, and restored functional harmony, achieving high patient satisfaction. The long-term success of these restorations depends not only on their aesthetic quality but also on the durability of the adhesive bond, which preserves function and reinforces patient confidence.

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