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Emax veneer

A Project Submitted to
The College of Dentistry, University of Mosul, Department of Conservative in Partial Fulfillment for the Bachelor of Dental Surgery

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Certification of the Supervisor

I certify that this project entitled " Emax veneer" was prepared by the fifth-year student Douha Nazim Mahmoud under my supervision at the College of Dentistry/University of Mosul in partial fulfilment of the graduation requirements for the Bachelor Degree in Dentistry.

Supervisor’s name : Assist. Prof. Fanar Turki Aljadwaa

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Introduction

Veneers have become a cornerstone of modern restorative and aesthetic dentistry, offering an effective and minimally invasive solution for enhancing the appearance of teeth as seen in (Figure 1). A veneer is a thin layer of material placed over the facial surface of a tooth to improve its color, shape, and size. Veneers are typically made from porcelain or composite materials, with porcelain being the most commonly used due to its superior aesthetic properties, strength, and durability (Al-Qutub et al., 2019). Since their introduction in the 1980s, veneers have revolutionized cosmetic dentistry, providing patients with natural-looking restorations that mimic the translucency and color of natural teeth. Over the years, advancements in materials and bonding techniques have expanded the scope and longevity of veneers, making them a popular choice for both cosmetic and restorative purposes (Al-Hawash et al., 2021).

Figure 1 : the effect of veneer

The introduction of Emax veneers, a material made primarily from lithium disilicate glass-ceramic, represents a significant advancement in the field of aesthetic dentistry. Developed in the early 2000s by Ivoclar Vivadent, Emax veneers quickly became one of the most widely used materials for dental restorations due to their superior mechanical and optical properties (Müller et al., 2019). Lithium disilicate, the core material in Emax, offers excellent strength and fracture toughness, making it a highly durable option for both anterior and posterior restorations (Al-Sheikhly et al., 2020). With a flexural strength of approximately 400 MPa, Emax veneers outperform traditional porcelain, which has a flexural strength of around 100-150 MPa (Mohamed et al., 2021). This marked a shift from the more brittle porcelain materials of the past to a stronger, more versatile ceramic material that could be used in a wider variety of clinical situations.

Emax veneers as shown in (Figure 2) are particularly favored for their aesthetic qualities, which include high translucency, natural color-matching, and light diffusion that closely mimic the appearance of natural teeth. The material's ability to reflect light in a similar manner to enamel allows for more lifelike restorations, especially in patients with complex color demands (Al-Hawash et al., 2021). The inherent strength of Emax, combined with its aesthetic properties, has made it a go-to material for both veneers and crowns, ensuring longevity and durability even in areas exposed to higher occlusal forces, such as molars (Mohamed et al., 2021). Additionally, advancements in CAD/CAM technology have enabled the precise fabrication of Emax veneers, reducing the time required for restoration and improving the overall fit and patient satisfaction (Fischer et al., 2020).

Figure 2: Emax Veneer

The development of bonding systems specifically designed for Emax veneers has also played a pivotal role in enhancing their clinical success. The adhesive technology used to bond Emax veneers to tooth structure ensures a durable and strong bond, which is essential for preventing veneer failure due to debonding or wear (Müller et al., 2019). Surface treatments such as acid etching and the application of bonding agents have significantly improved the bond strength between Emax and enamel, contributing to the overall longevity of the restoration (Al-Sheikhly et al., 2020). This has made Emax veneers suitable for a broad range of clinical applications, including aesthetic restorations in both anterior and posterior teeth.

The combination of strength, aesthetic appeal, and versatility makes Emax an ideal material for modern restorative dentistry. As dental technology continues to evolve, Emax veneers are likely to remain at the forefront of cosmetic dental procedures, offering patients high-quality, durable, and aesthetically pleasing outcomes. This material has not only enhanced the field of cosmetic dentistry but has also contributed to the growing demand for less invasive and more effective restorative solutions. Therefore, the purpose of this paper is to explore the material properties of Emax veneers, their clinical applications, and the factors that contribute to their growing popularity in contemporary dental practice.

Aim of Study

The aim of this study is to evaluate the material properties, clinical applications, advantages, and limitations of Emax veneers in restorative and aesthetic dentistry. By examining their mechanical and optical characteristics, bonding techniques, and clinical performance, this research seeks to highlight the benefits and potential challenges associated with their use. Additionally, the study aims to provide insights into the longevity, durability, and patient outcomes of Emax veneers, contributing to a better understanding of their role in contemporary dental practice.

Chapter one

Literature review

1.1 Materials and Composition

Emax veneers are primarily composed of lithium disilicate glass-ceramic, a material known for its exceptional strength, aesthetic qualities, and versatility in restorative dentistry. Emax was developed to overcome the limitations of earlier ceramic materials, such as feldspathic porcelain, which had inadequate strength for long-term use, especially in high-stress areas of the mouth. Lithium disilicate, the core material used in Emax veneers, provides an ideal balance between mechanical performance and aesthetic properties, making it one of the most widely used materials in contemporary dental practice (Müller et al., 2019).

Figure 3 : lithium disilicate glass-ceramic

1.1.1 Lithium Disilicate: The Core Material

Lithium disilicate ($Li2Si2O5$) is a glass-ceramic material composed of silicon dioxide and lithium oxide. Its unique crystalline structure contributes to its high fracture toughness and flexural strength, which are vital for ensuring the durability of dental restorations (Al-Sheikhly et al., 2020). The material is created through a two-phase process, where a glass matrix surrounds the lithium disilicate crystals. This composition allows the material to offer superior strength while maintaining an outstanding level of translucency, closely mimicking natural tooth enamel (Al-Qutub et al., 2019).

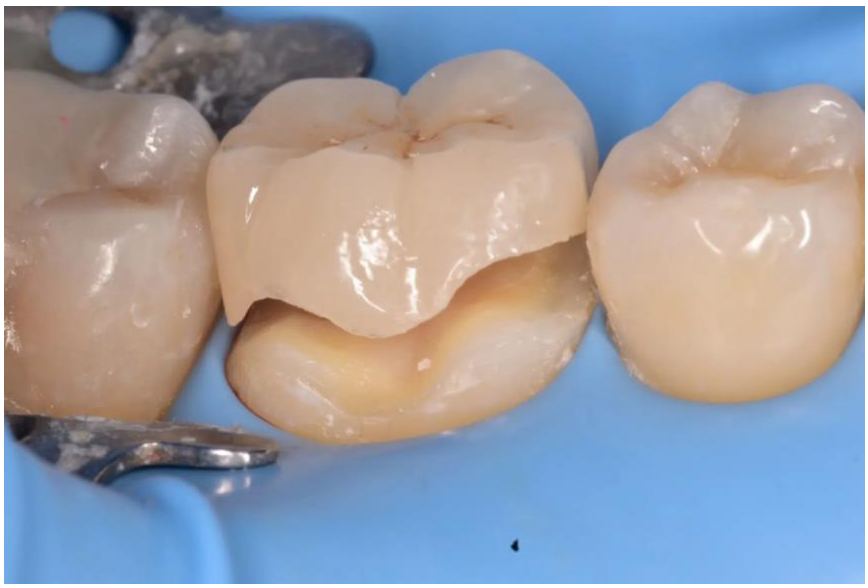


Figure 4: Partial coverage with lithium disilicate overlay

The lithium disilicate glass-ceramic has a crystalline content ranging between 55-70%, with the remaining 30-45% composed of a glass matrix. This combination enhances the material's flexural strength, making it ideal for both anterior and posterior restorations. It is especially favored for veneers, crowns, and other aesthetic restorations in the dental field (Müller et al., 2019).

The increased strength of lithium disilicate is attributed to its partially crystalline structure, which serves as a reinforcement to the glass matrix, preventing the propagation of cracks. Studies have demonstrated that Emax veneers exhibit a flexural strength of approximately 400 MPa, which is significantly higher than that of conventional porcelain materials (Müller et al., 2019). This strength is particularly important in dental applications, as it enables the material to withstand the mechanical stresses generated during chewing and biting.

1.1.2 Mechanical Properties of Emax Veneers

The mechanical properties of Emax veneers play a significant role in their effectiveness as restorative materials. Emax has a high fracture toughness (approximately 1.2 MPa·m1/2), making it more resistant to fracture and damage under stress compared to traditional porcelain materials (Al-Sheikhly et al., 2020). The increased strength and resistance to breakage make Emax a reliable choice, particularly in patients with a history of bruxism or those who require restorations in areas of high occlusal force, such as the molars.

Another important mechanical property of Emax is its wear resistance, which contributes to its longevity. Emax veneers are designed to resist wear and tear, ensuring that they retain their aesthetic and functional properties over time (Al-Qutub et al., 2019). This high level of wear resistance is achieved by the material's crystalline structure, which prevents the formation of surface imperfections that could lead to staining or chipping over time.

Additionally, the bonding strength between Emax veneers and the tooth structure is another critical factor in ensuring their long-term durability. The use of advanced adhesive systems in combination with the material's surface treatment methods allows for a strong bond, reducing the risk of veneer debonding and enhancing the overall longevity of the restoration (Müller et al., 2019).

1.1.3 Aesthetic Properties of Emax Veneers

The aesthetic properties of Emax veneers are another reason for their widespread use in cosmetic dentistry. One of the most remarkable characteristics of Emax is its high translucency, which allows the material to mimic the light-reflecting properties of natural tooth enamel. This feature is particularly valuable in anterior restorations, where achieving a lifelike appearance is crucial for patient satisfaction (Al-Hawash et al., 2021). The natural appearance of Emax veneers is due to the material’s optical properties, which include light diffusion, similar to the way natural enamel scatters light.

Figure 5: the aesthetic aspect of Emax veneer

Moreover, Emax veneers are available in a variety of shades, making it easier for dental professionals to match the veneers to the natural color of the patient’s teeth. The material’s color stability over time further enhances its suitability for long-term cosmetic restorations, as it resists discoloration from dietary habits and oral hygiene practices (Al-Qutub et al., 2019). This characteristic makes Emax an excellent option for patients who are concerned about the potential for staining and discoloration over time.

The esthetic flexibility of Emax veneers is further enhanced by the ability to apply staining and glazing techniques. These techniques allow dental professionals to customize the color and texture of the veneer’s surface to ensure a natural-looking finish that matches the surrounding teeth (Al-Sheikhly et al., 2020).

1.1.4 Advantages of Emax Veneers

Emax veneers offer several advantages over traditional porcelain veneers and other restorative materials. First, their strength allows them to be used in a wider range of applications, from highly aesthetic anterior restorations to functional posterior crowns and bridges (Al-Qutub et al., 2019). The high fracture toughness and wear resistance of Emax ensure that the veneers can withstand the forces of mastication without breaking or chipping, even in patients with bruxism or heavy occlusal forces.

Secondly, the aesthetic properties of Emax make it a preferred material for patients seeking natural-looking results. Its translucency, ability to mimic enamel, and long-term color stability contribute to its widespread use in cosmetic dentistry (Al-Hawash et al., 2021). Furthermore, Emax veneers offer improved bonding to tooth structures, which leads to better clinical outcomes and a longer lifespan for restorations compared to other materials (Al-Sheikhly et al., 2020).

Lastly, the development of CAD/CAM technology for the fabrication of Emax veneers has significantly improved the accuracy, speed, and ease of production. The ability to create precise, custom veneers based on digital impressions has streamlined the process, reducing the number of visits required and enhancing patient comfort (Fischer et al., 2020). Studies have also shown that CAD/CAM-fabricated lithium disilicate restorations exhibit excellent marginal fit and long-term durability, further supporting their use in clinical practice (Guess et al., 2010).

Figure 6 : CAD/CAM technology

1.2 Clinical Applications of Emax Veneers

Emax veneers have become a cornerstone in modern restorative and aesthetic dentistry, offering versatile solutions for a variety of clinical challenges. Their unique combination of strength, durability, and aesthetic appeal makes them suitable for a wide range of applications, from cosmetic enhancements to restorative procedures in both anterior and posterior teeth. This section explores the key clinical applications of Emax veneers, emphasizing their suitability for various dental conditions and patient needs.

1.2.1 Aesthetic Enhancements in Anterior Teeth

One of the most common applications for Emax veneers is in the aesthetic enhancement of anterior teeth. Patients often seek treatment for issues such as discoloration, chipped teeth, misalignment, and irregular tooth shapes. Traditional restorative materials, such as composite resins, may not provide the same level of aesthetic outcomes, particularly in terms of translucency and color matching. Emax veneers, with their superior light-reflecting properties, mimic the appearance of natural enamel and offer a highly desirable aesthetic solution for such issues (Al-Hawash et al., 2021).

Figure 7: aesthetic enhancement.

For discolored teeth, Emax veneers provide an excellent alternative to traditional whitening methods, especially in cases where intrinsic stains or severe discoloration are present. The translucency of the material allows it to blend seamlessly with the surrounding natural teeth, achieving a more natural and aesthetically pleasing result than other materials (Al-Sheikhly et al., 2020). Furthermore, Emax veneers can be customized in terms of shade and texture, ensuring that they match the unique characteristics of the patient's natural teeth, contributing to a highly individualized and lifelike restoration (Al-Qutub et al., 2019).

1.2.2 Correction of Tooth Shape and Alignment

Emax veneers are also commonly used for the correction of tooth shape and alignment in the anterior region. In cases of teeth that are misshapen, uneven, or too small, veneers can be designed to provide an ideal cosmetic outcome without the need for extensive tooth preparation (Müller et al., 2019). Emax veneers are ideal for cases of diastema closure (gaps between teeth), mild crowding, and chipped edges, providing an effective and conservative solution to enhance both function and appearance.

The versatility of Emax veneers allows them to be used for a wide range of restorative and esthetic goals. In many instances, minimal tooth preparation is required, preserving the natural tooth structure while achieving a significant improvement in appearance. This aspect of Emax veneers is particularly beneficial for patients seeking non-invasive treatments that do not compromise the integrity of their natural teeth (Fischer et al., 2020).

Figure 8: Shape correction

1.2.3 Full Coverage Restorations for Posterior Teeth

While Emax veneers are often associated with anterior teeth due to their superior aesthetic properties, the material has also gained popularity for use in posterior teeth as full-coverage crowns. The exceptional strength of lithium disilicate makes it suitable for restorations in areas that experience significant occlusal forces. Emax's flexural strength of 400 MPa allows it to withstand the masticatory forces encountered in the posterior region, making it a viable option for patients who require durable and aesthetically pleasing crowns (Al-Sheikhly et al., 2020).

Emax crowns offer advantages over traditional materials like metal-ceramic crowns, which may compromise aesthetic outcomes due to their opaque appearance and the need for extensive tooth reduction. In contrast, Emax crowns provide a more natural-looking restoration, with translucency that mimics natural tooth structure. This makes Emax an ideal material for restoring molars and premolars where both function and aesthetics are important (Müller et al., 2019).

1.2.4 Treatment for Fractured or Broken Teeth

Emax veneers are also commonly employed for the restoration of fractured or broken teeth. In cases where a tooth has been damaged due to trauma, decay, or other factors, Emax veneers offer a reliable and aesthetically pleasing solution for rebuilding the tooth. Unlike traditional porcelain restorations, Emax provides superior fracture resistance, ensuring that the restored tooth can withstand daily functional forces without breaking or chipping (Al-Qutub et al., 2019).

In cases of significant tooth wear or fractures, Emax veneers can be used to recontour and reshape the damaged teeth. The high fracture toughness and wear resistance of the material ensure long-lasting restorations, even in patients with bruxism or other conditions that may subject their teeth to higher-than-normal forces (Müller et al., 2019).

Figure 9: Treatment of fractured teeth

1.2.5 Minimal Invasive Approach in Treatment Planning

One of the key advantages of Emax veneers is their ability to provide minimal-invasive solutions in cosmetic dentistry. Emax is an ideal material for patients seeking conservative treatment options, as it requires minimal tooth preparation compared to other restorative treatments like crowns. In many cases, Emax veneers can be applied without the need for extensive tooth reduction, preserving the natural tooth structure (Al-Sheikhly et al., 2020). This conservative approach minimizes the risk of complications such as tooth sensitivity and preserves the long-term health of the tooth.

Additionally, the development of CAD/CAM technology has streamlined the process of veneer production, allowing for precise, customized restorations that fit perfectly with the tooth's anatomy. This technology enables dental professionals to offer highly accurate and efficient treatment plans, reducing the number of visits and improving overall patient satisfaction (Fischer et al., 2020).

1.2.6 Longevity and Durability of Emax Veneers

One of the major reasons for the growing popularity of Emax veneers is their longevity and durability. Emax veneers have been shown to exhibit long-term success, often lasting for 10-15 years with proper care and maintenance. The superior mechanical properties of the material, combined with its exceptional bonding capabilities, ensure that the veneers remain securely in place and retain their aesthetic qualities over time (Al-Qutub et al., 2019). The resistance to staining, fracturing, and wear ensures that Emax veneers maintain their functionality and appearance for many years, making them a cost-effective option in the long run.

In conclusion, Emax veneers offer a wide range of clinical applications, from enhancing aesthetics to restoring function in both anterior and posterior regions. Their aesthetic appeal, strength, and minimal invasiveness make them a highly desirable choice for dental professionals and patients alike. As dental technology continues to advance, it is expected that Emax veneers will remain a central material in aesthetic and restorative dentistry, offering durable and natural-looking results.

1.3 Challenges and Limitations of Emax Veneers

While Emax veneers offer a range of advantages, including aesthetic appeal, durability, and versatility, they also present certain challenges and limitations that should be considered during treatment planning. Understanding these challenges is crucial for both clinicians and patients to ensure that Emax veneers are the most suitable option for their specific needs. This section explores the primary challenges associated with Emax veneers, including issues related to tooth preparation, cost, fracture potential, biocompatibility, and patient-specific factors.

1.3.1 Tooth Preparation and Minimal Invasiveness

Although Emax veneers are known for their minimal invasive preparation compared to traditional full crowns, some degree of tooth reduction is still necessary for optimal results. The extent of preparation required depends on the patient’s original tooth structure and the clinical indications for the veneer. In cases of severely damaged or worn teeth, substantial reduction may be needed, potentially impacting the long-term health of the tooth (Al-Hawash et al., 2021).

In general, minimal preparation is one of the significant benefits of Emax veneers, but the trade-off is that they require precise tooth morphology and an accurate fit. If the veneer is not properly designed or fabricated, it can result in marginal discrepancies or inadequate bonding, which may compromise the long-term success of the restoration. Furthermore, a poor fit can lead to secondary caries or dentin hypersensitivity (Al-Sheikhly et al., 2020). Thus, meticulous tooth preparation and attention to detail during the adhesive process are critical to achieving optimal clinical outcomes.

1.3.2 Cost Considerations

One of the significant limitations of Emax veneers is their cost, which can be higher than that of other restorative materials such as composite resins or traditional porcelain veneers. The increased cost of Emax veneers is primarily due to the advanced materials and CAD/CAM technology required to produce them, as well as the expertise needed for their placement (Müller et al., 2019). The labor-intensive process and high-quality materials also contribute to the overall expense.

While Emax veneers offer excellent aesthetic and functional results, the price may be a barrier for some patients, particularly in regions where dental care may not be fully covered by insurance or where patients may have limited financial resources. As a result, some patients may opt for more affordable alternatives, such as composite veneers, which can be a viable option for some cases but may not provide the same level of durability or aesthetic appeal as Emax veneers (Al-Qutub et al., 2019).

1.3.3 Potential for Fracture

Although Emax veneers are known for their high fracture toughness, they are not entirely immune to damage. Emax is still a ceramic material, and as such, it can be prone to chipping or fracturing under extreme occlusal forces, especially in patients with bruxism (teeth grinding) or those who habitually clench their teeth. While the flexural strength of Emax is significantly higher than traditional porcelain, severe and repetitive mechanical stresses can still cause damage to the veneer over time (Al-Sheikhly et al., 2020).

In cases of severe bruxism, patients may need to wear a nightguard or take additional preventive measures to protect their veneers from wear and fracture. Furthermore, veneers placed in the posterior region, where occlusal forces are highest, may be at greater risk of failure if the proper occlusion is not carefully managed during treatment planning (Al-Hawash et al., 2021). Clinicians must assess the occlusion and bite of each patient to determine the suitability of Emax veneers for specific cases.

Figure 10: Night guard

1.3.4 Biocompatibility and Sensitivity Issues

Despite its high strength and aesthetic benefits, lithium disilicate—the primary material in Emax veneers—may pose potential biocompatibility concerns for some patients. Allergic reactions to materials used in dental restorations, though rare, have been reported. The silica content in lithium disilicate can sometimes cause mild reactions in patients with hypersensitivity, although the overall biocompatibility of Emax veneers is generally considered excellent (Al-Qutub et al., 2019).

Additionally, tooth sensitivity may occur after placement if the tooth preparation is not done properly or if the adhesive bond fails. Tooth sensitivity is most commonly reported in the initial period following veneer placement and usually resolves over time as the bond fully matures. However, in some cases, sensitivity may persist, necessitating the consideration of alternative materials or techniques to reduce discomfort (Al-Sheikhly et al., 2020).

1.3.5 Wear and Aesthetic Compromise Over Time

While Emax veneers have exceptional wear resistance, they are not completely immune to wear over time. Factors such as dietary habits, oral hygiene, and the presence of bruxism can influence the longevity and appearance of the veneers. The incisal edges of the veneers, in particular, are more susceptible to wear due to constant contact with opposing teeth. If the veneer becomes excessively worn, it may lose its esthetic properties and no longer blend as seamlessly with the surrounding natural teeth (Fischer et al., 2020).

To mitigate this issue, patients are often advised to maintain proper oral hygiene and avoid habits that can contribute to excessive wear, such as chewing on hard objects or grinding their teeth. In addition, the occlusal design should be carefully considered during treatment planning to prevent overloading specific areas of the veneer, particularly in patients who are at risk for tooth wear (Müller et al., 2019).

1.3.6 Contraindications for Emax Veneers

While Emax veneers are highly versatile, there are certain contraindications where their use may not be appropriate. For example, in patients with extensive tooth decay or root canal-treated teeth, the remaining tooth structure may be insufficient to support a veneer without compromising the restoration's integrity. In such cases, a more substantial restoration, such as a full crown, may be required (Al-Hawash et al., 2021).

Additionally, Emax veneers may not be ideal for patients who suffer from severe occlusal dysfunction or those who have uncontrolled bruxism. In such cases, alternative materials with higher impact resistance, such as zirconia or metal-based crowns, may be more appropriate (Al-Qutub et al., 2019).

Chapter two

discussion

The investigation of Emax veneers within this study highlights a pivotal advancement in restorative dentistry, facilitated by developments in material science and digital manufacturing technologies. The transition from conventional porcelain to lithium disilicate glass-ceramic materials has addressed previous limitations concerning strength and durability while simultaneously enhancing aesthetic outcomes. This discussion synthesizes key findings, critically evaluating both the clinical efficacy and the challenges associated with the application of Emax veneers.

One of the most salient advantages of Emax veneers is their optimal balance between mechanical resilience and aesthetic fidelity. With a flexural strength approximating 400 MPa and superior fracture toughness, these restorations demonstrate exceptional resistance to occlusal stresses, including those encountered in posterior dentition (Müller et al., 2019; Al-Sheikhly et al., 2020). Moreover, the material's capacity to replicate the translucency and optical behavior of natural enamel has been widely recognized as a critical factor in achieving biomimetic restorations, thereby fulfilling the increasingly exacting aesthetic demands of contemporary dental practice (Al-Hawash et al., 2021).

Nevertheless, the clinical implementation of Emax veneers is not devoid of challenges. Precise tooth preparation is imperative to secure an optimal fit and bonding interface, as even minor discrepancies may result in marginal gaps, secondary caries, or postoperative sensitivity (Al-Sheikhly et al., 2020). Furthermore, while the cost of Emax veneers is commensurate with their advanced material properties and longevity, it remains a considerable factor in patient decision-making, particularly in comparison to more cost-effective alternatives such as composite resin veneers (Müller et al., 2019). Additionally, the risk of fracture under extreme occlusal forces, particularly among patients exhibiting parafunctional habits such as bruxism, necessitates a comprehensive preoperative assessment to ensure suitability for this restorative modality (Al-Hawash et al., 2021).

The integration of computer-aided design and computer-aided manufacturing (CAD/CAM) technology in the fabrication of Emax veneers has significantly enhanced the precision and efficiency of these restorations. This digital workflow not only minimizes the invasiveness of tooth preparation but also improves the marginal adaptation and longevity of the veneers (Fischer et al., 2020). However, the dependence on advanced digital infrastructure and the requisite learning curve for practitioners underscore the need for continued professional development and technical refinement.

Future research should focus on optimizing adhesive protocols and refining preparation methodologies to further enhance the clinical performance of Emax veneers. Longitudinal clinical trials and comprehensive cost-benefit analyses are imperative to elucidate the long-term durability and overall efficacy of these restorations relative to alternative materials. Such investigations will contribute to evidence-based advancements in restorative and aesthetic dentistry.

Chapter three

Conclusion

Emax veneers, made from lithium disilicate, represent a significant advancement in aesthetic dentistry, offering numerous benefits for both functional and cosmetic restoration of anterior and posterior teeth. Their superior aesthetic properties, including natural translucency and the ability to match natural tooth color, make them a popular choice for patients seeking high-quality, long-lasting restorations. The material's fracture toughness and flexural strength contribute to its durability, making it a preferred option for cases where both aesthetic and functional demands are high (Al-Hawash et al., 2021). Moreover, the minimal invasive approach in tooth preparation is another factor that enhances patient satisfaction, as it preserves natural tooth structure while still providing excellent results.

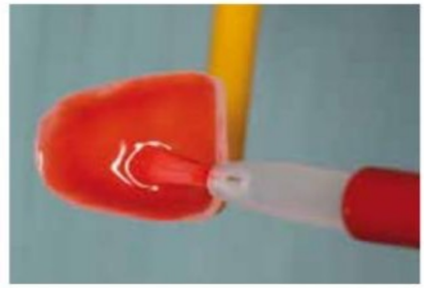
However, like all dental materials, Emax veneers have their limitations. Tooth preparation must be precise to avoid issues with marginal discrepancies, which can lead to secondary caries or failure of the adhesive bond (Al-Sheikhly et al., 2020). Cost remains a significant barrier, as the technology and high-quality materials used in fabricating Emax veneers make them more expensive than alternative restorative options, such as composite veneers (Müller et al., 2019). Additionally, while Emax veneers are highly resistant to fractures, they can still break or wear down under extreme forces, such as in patients with bruxism (Fischer et al., 2020). The biocompatibility of the material is generally good, but sensitivity reactions or allergic responses may occur in rare cases (Al-Qutub et al., 2019).

Despite these challenges, the clinical success of Emax veneers continues to grow, with advancements in material science and bonding techniques helping to mitigate many of these concerns. Careful case selection and proper planning are crucial to ensuring the long-term success of these restorations. For patients who meet the criteria for Emax treatment, the benefits far outweigh the risks, providing a highly durable, aesthetically pleasing solution to a variety of dental issues. Moving forward, as materials continue to evolve, the versatility and resilience of Emax veneers are likely to improve further, expanding their use and applications in both cosmetic and restorative dentistry

Figure 10: Clinical case step by step

The temporary restorations are removed. The preparations are cleaned with a polishing brush and an oil- and fluoride-free cleaning paste (e.g. Proxyt® fluoride-free). Subsequently, the preparations are rinsed with water spray and dried with oil-free air.

For the esthetic inspection, Variolink® Veneer Try-in Paste can be used. After the try-in, the Try-In Paste is thoroughly washed off with water spray, and the restoration is dried with oil- and moisture-free air.



Etching is performed with 5% hydrofluoric acid (e.g. IPS® Ceramic Etching Gel) for 20 seconds. Subsequently, the preparation is rinsed thoroughly with water and dried with oil-free air.

Monobond® Plus is applied onto the pretreated surface, allowed to react for 60 seconds and then thoroughly dispersed with air.

The treatment field is isolated with a rubber dam (e.g. OptraDam®) and the preparation is cleaned again according to the steps described above. Subsequently, the preparation is dried with oil-free air. Overdrying must be avoided.

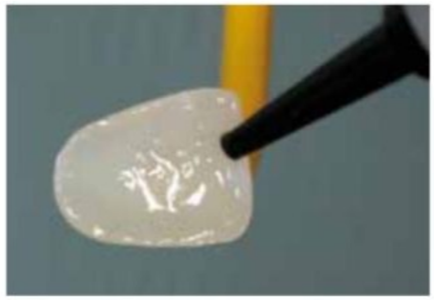
Total Etch (37% phosphoric acid gel) is applied. The phosphoric acid is allowed to react on the enamel for 15–30 seconds and on the dentin for 10–15 seconds.

Subsequently, the gel is thoroughly rinsed off with a vigorous water spray for at least 5 seconds. Excess moisture is removed leaving the dentin surface with a slightly glossy wet appearance (wet bonding).

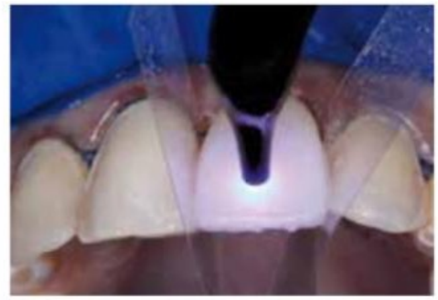
Syntac® Primer is applied on the preparation using a brush, gently rubbed in and allowed to react for at least 15 seconds. Excess of Syntac Primer is dispersed and thoroughly dried. It is not rinsed off.

Syntac Adhesive is applied and allowed to react for 10 seconds. Subsequently, the preparation is thoroughly dried with an air syringe. It is not rinsed off.

Heliobond is applied and dispersed to a thin layer. Heliobond is only polymerized together with the cementation material.

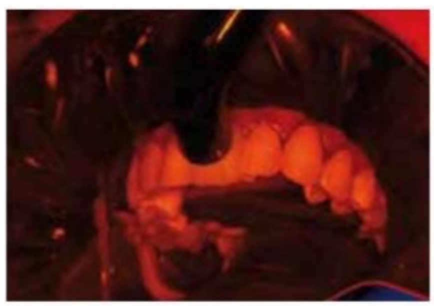


Variolink Veneer is applied directly onto the preparation and/or onto the inner side of the restoration, if required. Subsequently, it is seated and held in place maintaining stable pressure.



The restoration is tacked in place by light-curing a small area for 3–4 seconds (e.g. Bluephase®, 650 mW/cm², LOW mode). Excess material is removed using a suitable instrument.

In order to prevent oxygen inhibition, the restoration margins are covered with glycerine gel/air block (e.g. Liquid Strip) immediately after removal of excess.



If a curing light with an output of at least 800 mW/cm² is used, each mm of the ceramic material and segment is polymerized for at least 10 seconds. Subsequently, Liquid Strip is rinsed off. The cementation steps are repeated for all veneers.

Proximal areas are reworked using finishing and polishing strips. The restoration margins are polished using polishers (Astropol®) or disks.

A thin layer of Fluor Protector is applied, evenly dispersed and dried with an air syringe.

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