Egyptian Prosthodontic Association
(EPA Newsletter)

Ceramic Partial Laminate Veneers

Master the Details

Electronic Newsletter

Volume 3. Issue 10

October 2024

The variety of all-ceramic restorations, their clinical success, digital planning and fabrication, and the advancements in adhesive bonding have caused the paradigm shift from conventional to conservative treatment options.

One of the minimal invasive solutions that have been introduced to preserve the maximum amount of irreplaceable anterior tooth structure and serve as a durable, enamel-friendly, and color stable restoration is the ceramic partial laminate veneer.

Ceramic partial laminate veneers are fragments replacing missing part only by additive concept as almost no sound tooth structure is removed during preparation.

Clinical indications for ceramic partial laminate veneers

Ceramic partial laminate veneer has two main indications: anterior diastema (Spacing) and incisal edge fracture.

1- Anterior diastema:

In certain cases of anterior diastema, orthodontic treatment alone cannot properly close the diastema thus making the restorative treatment option mandatory. Restorative treatments include either the direct composite resin or the indirect ceramic laminate veneer.

Direct composite resin has the advantage of being minimally invasive, more conservative, performed in a single visit and relatively inexpensive. However, it requires advanced sculpting and finishing skills to achieve an optimally polished restoration with an ideal anatomic form. It is expected to suffer from wear and discoloration over time which requires their frequent replacement [1-3].

Courtesy of Gonçalves LF.[1]

Figure 1: Management of diastema closure using conventional laminate veneers that sacrifice the intact labial surface of the tooth.

On the other hand, ceramic veneers showed longer survival rates compared to composite restorations [4]. This is attributed to their color stability exceeding ten years of service as well as favorable wear resistance [5,6].

Conventional ceramic veneers can produce a restoration with exquisite esthetics and excellent longevity but sacrifice the healthy labial tooth structure to allow space for the restorative material [1]. (Figure 1)

Ceramic partial laminate veneers act as a good alternative preserving the maximum amount of tooth structure [7]. (Figure 2)

2- Incisal edge fracture

One of the common and challenging fractures that have been noticed in the anterior teeth is the fracture of the incisal edge [8,9].

Ceramic partial laminate veneers simply follow the additive concept to correct minor anterior esthetic defects and fractures. They totally rely on adhesive bonding to the enamel substrate as almost no sound tooth structure is removed during preparation [10]. (Figure 3, 4)

Ceramic materials used for ceramic partial laminate veneers

Glass-ceramics offer the advantage of superior esthetics with regards to shade and surface texture and play a key role in adhesive bonding of partial laminate veneers to the underlying tooth structure which is expected to enhance the biomechanical performance of the restored tooth [11].

When available, the commonly used materials were veneering or layering ceramics, such as potassium feldspar reinforced with leucite crystal ceramic, nano fluorapatite glass ceramic, and fluorapatite glass-ceramic reinforced with leucite, and lithium disilicate. Lithium disilicate ceramics have higher predictable clinical longevity than feldspathic ceramics owing to their better mechanical properties and comparable esthetic characteristics [12].

Tooth preparation for ceramic partial laminate veneers

Tooth preparation was not performed in cases of diastema closure. The advantages of the no-prep veneers are simply that the teeth are not prepared, the adhesion is performed fully on enamel, and patients acceptance is high [7].

While in cases of incisal edge fracture of the tooth, the procedure is only limited to minimal preparation with a conservative finish line and smoothing of the sharp angles. These angles were eliminated to reduce possible fractures on the ceramic restoration [13].

Generally, tooth preparation for ceramic partial laminate veneers is not an easy procedure, and it requires strong attention both by the ceramist, for the lab procedures, and by the dentist during try-in

Courtesy of Dazhaev G.[7]

Figure 2: Management of diastema closure using ceramic partial laminate veneers.

Courtesy of Durán Ojeda et al.[10]

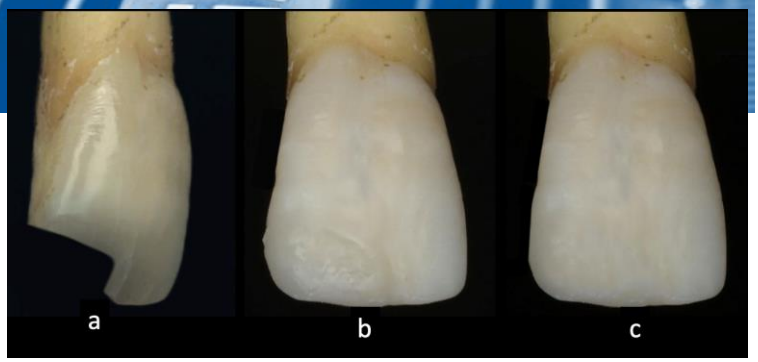
Figure 3: Management of incisal edge fracture using ceramic partial laminate veneers.

Courtesy of Durán Ojeda et al.[11]

Figure 4: Ceramic partial laminate veneers on upper central incisors. a. blue line denotes the outline of the preparation b. Cemented veneers

and cementation. Moreover, aesthetics is not so "perfect" as full-prep veneers, as the margins are not hidden and could be seen, but usually, on a macro view picture and not in daily social life [7].

Lately, there has been an approach to use a bevel finish line design in these cases to provide color blending property when the restoration is adhesively cemented to tooth structure, thus acting as a valid solution for the recognized slight color mismatch drawback that accompanies the ceramic partial laminate veneers with conservative chamfer margins at the interface between the tooth and the restoration [10]. (Figure 5)



Courtesy of Nabil and Idris.[14]

Figure 5: Ceramic partial laminate veneer a. preparation with bevel finish line. b. immediately after cementation c. after finishing and polishing.

Clinical performance of ceramic partial laminate veneers

A multicenter retrospective study reported high success rates at five years of follow-up, with noticeably decreased success rates at eight years. This particular situation is related to the small number of ceramic partial laminate veneers evaluated in the final clinical evaluation. Fifty-two restorations were followed up at eight years, and only four had failed (mainly bulk fractures). Marginal defects and staining were observed in some restorations that did not necessarily require replacement. Instead, according to the modified USPHS criteria used in this study, repolishing may be indicated, thereby extending the clinical service of restorations [10].

Few studies have investigated the clinical performance of ceramic partial laminate veneers. Although their short-term performance is like conventional ceramic laminate veneers with the advantage of being more conservative, more clinical studies are needed to evaluate their long-term performance. Also, studies are necessary to determine the correct selection of the ceramic material and its preparation design if necessary and to follow a suitable finishing and polishing protocol [10].

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