



RESEARCH ARTICLE

ESTHETIC REHABILITATION OF FRACTURED AND MALPOSITIONED ANTERIOR TEETH-CASE REPORTS

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Abstract

Controversy persists regarding the treatment planning criteria for young adult patients in need of esthetic restorations. With the introduction of etching and bonding techniques, porcelain laminate veneers have become more popular in the field of aesthetic dentistry. A step-by-step protocol is proposed for diagnostic evaluation, mock-up fabrication and trial, teeth preparation and impression, and adhesive cementation. The resolution of initial esthetic issues, patient satisfaction, and nice integration of indirect restorations confirmed the success of this anterior dentition rehabilitation.

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Introduction:-

Re-establishment of proper esthetics and function in the anterior region is utmost important for the patient. Discolored, unsightly, malpositioned, malformed anterior teeth and midline diastemas can make the individual psychologically depressed and socially less active.¹ With the introduction of etching and bonding techniques, porcelain laminate veneers have become more popular in the field of aesthetic dentistry. While composite veneers have improved a lot since their introduction into dentistry, they still have a few drawbacks such as wear, marginal and incisal edge fractures, and discoloration. Porcelain veneers are more stable, exhibit better wear resistance, better esthetics and shown less plaque retention. With advancements in adhesive and bonding techniques, the long-term survival rate of laminate veneers has improved dramatically. Conservation of tooth structure has apparently become a major factor in determining the long term prognosis of any restorative procedure. Most important advantages of porcelain laminate veneers is that they are extremely conservative in terms of tooth reduction.²

Case Report:

A 25 years old male reported to the department of conservative dentistry and endodontics with the fracture of upper central incisor and a labially inclined upper lateral incisor. [Figure 1 & 2] Due to young age, patient was insisting for esthetic correction of his unesthetic anterior teeth. Radiographic and clinical examination did not reveal any periapical pathological condition, so esthetic correction with porcelain veneers for right maxillary premolar to the left maxillary premolar except left maxillary lateral incisor were planned. The treatment objectives were to manage the discoloration, modify the contours of the teeth and root canal treatment with full crown in upper lateral incisor. Patient was informed about the existing condition, treatment procedure was explained and the consent was taken. Diagnostic impressions were made and diagnostic wax-up was carried out.

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Figure 1

Figure 2

Tooth preparation:

First of all, the upper central incisor was restored with composite resin and intentional root canal treatment of maxillary left lateral incisor was done because diagnostic wax-up dictated that the lateral incisor needed more tooth reduction than indicated for laminate veneers which could have resulted in traumatic pulpal exposure. Therefore prophylactic intentional root canal treatment was performed. Except the maxillary left lateral incisor, veneer preparation for maxillary anterior teeth and both 1st premolars was carried out.

The teeth were prepared for laminate veneer thickness starting with the labial surface by using depth cutting burs from mesio-proximal line angle to disto-proximal line angle. Three-depth cuts in each cervical, middle, and incisal third of the teeth were given with the dimension of 0.3, 0.5, and 0.7 mm, respectively. Finish line was prepared by using a long tapered medium or fine grit snub-nosed diamond bur. A chamfer margin (0.3-0.4 mm in depth) was prepared beginning at the height of the free gingival margin and extended toward distal papilla tip and then toward mesial papilla tip. Without breaking the contact from labial side, the finish line was carried from the point to the incisal embrasure, cutting just labial (0.2 mm) to entire contact area. The incisal edges were prepared to provide the bulk for the porcelain (0.75-1.5 mm, average 1 mm). The preparations were extended at linguoincisor line angle as butt joint at incisal angles would have led to stress concentration and finally dislodgement of the veneers. [Figure 3, 4, 5] Once the preparation was completed, impressions were made using polyvinyl siloxane impression material (3M ESPE) by putty-wash technique. [Figure 6]



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7

Try in and Cementation:

Try in of the veneers was done. After patients acceptance cementation was planned. The inner surface of porcelain veneers was treated by acid etching with 10% hydrofluoric acid (ultradent porcelain etch) prior to silanization. A silane coupling agent (ivoclarvivadentvariolinkII) was applied to the internal veneer surface for 60 s and air-dried. Gingival retraction cord was placed on the prepared teeth to decrease the crevicular fluid flow. [Figure 7] During cementation procedure, each tooth was etched for 15 s using a 37% phosphoric acid etch-gel (ivoclar N etchant gel). Subsequently, the tooth surface was rinsed thoroughly and air-dried gently. Dentin adhesive (3M single bond universal adhesive) was applied in 2 coats. Following the bonding application, a thin layer of light polymerizing composite resin luting cement was applied at the surface of the veneers, placed onto the prepared teeth and light-polymerized for 40 s (ivoclarvivadentvariolink II) from palatal, labial, and incisal sides. Similar steps were followed for the full crown cementation for lateral incisor. initial tack cure for 5 sec was done (bluehase ivoclarvivadent). Excess luting cement was removed. followed by complete polymerization on the palatal and Buccal aspects. The marginal area was finished and polished with abrasive discs. Restorations were checked to avoid any occlusal interference. [Figure 8,9,10,11]



Figure 8



Figure 9



Figure 11



Figure 10



Figure 12



Figure 13

Discussion:-

The trend of conservative treatment continues to become widely acknowledged. When choosing between conservative and more aggressive treatment approaches, the potential need to retreat patients in the future should be taken into account, especially in young patients. Therefore, the type of prospective failure is of major importance as well. This is especially true today as dramatic improvements in dental technology significantly improve available patient treatments.³

Most important advantages of porcelain laminate veneers is that they are extremely conservative in terms of tooth reduction. In the present case report, only 0.3 to 0.5 mm reduction on the labial surface was done. This minimal reduction rarely leads to pulpal involvement which is a major advantage of porcelain laminate veneers.⁴

With indirect techniques a previsualization of the final esthetic result is extremely useful both for the clinician and for the patient: in this way, desires and preferences related to the new smile are tested before carrying out irreversible teeth preparations. For these reasons, a diagnostic approach is highly recommended when interventions are focused on the anterior area of the mouth.⁵⁻⁶

When restoring maxillary anterior teeth, the incisal edge position should be in harmony with the envelope of function.⁷ Veneers with an incisal butt-joint or feathered edge usually demonstrate fracture loads similar to those of unprepared teeth. In this case, the incisal edge was reduced by up to 2 mm. However, the preparation's margins must be chamfered and in enamel.⁸

The scientific literature is more extensive for ceramic laminates, a recently published clinical trial (with a 3-years follow-up)⁹ has reported no significant difference in the survival rate of composite (87%) and ceramic (100%) veneers.

The use of porcelain veneers to solve esthetic and/or functional problems in the anterior section has been shown to be a convincing option. Years of experience with both the technique and the materials employed offer satisfactory, predictable, and lasting results.¹⁰ Porcelain veneers restore the mechanical behavior and microstructure of the intact tooth in vitro even when they are bonded to an extensive dentin surface using an optimized application mode of dentine adhesives.⁴

Conclusion:-

Advancement in the technique, ceramic materials, and luting cements made porcelain veneering the most accepted treatment for esthetic correction of the anterior teeth. This case report presents an esthetic rehabilitation of discolored, fractured and malpositioned maxillary teeth.

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