Aesthetic correction by making anterior adhesive bridge mesh design: A case report

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Abstract

Objective: The article aims to present an aesthetic correction for tooth loss in the anterior region of the mandible by making an anterior adhesive bridge.

Case Report: The patient complained of decreased self-assurance due to the absence of teeth in the lower right central incisor area following an accident. They desire a permanent denture solution but are reluctant to undergo extensive tissue removal. The treatment carried out was by making an anterior adhesive bridge using a mesh design. The mesh was designed to increase the retention of the metal wing surface in contact with the abutment teeth.

Results: The patient was happy that they could use their teeth for chewing as well as for improving his appearance when smile.

Conclusion: It was concluded that the mesh design adhesive anterior bridge construction was a conservative treatment option for aesthetic correction of missing teeth in the mandibular anterior region.

Keywords: Adhesive bridge, Aesthetic correction, Fixed partial denture, Partial tooth loss, Resin bonded fixed partial denture.

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Introduction

Tooth loss is a common occurrence among the numerous patients we encounter on a daily basis. Cases of tooth loss can occur due to various causes, such as caries, trauma, periodontal disease, and others. Data for 2010, 2.3% of the world's population, representing 158 million people around the world, have no teeth.1,2 The condition of losing teeth in the oral cavity can cause several abnormalities, such as migration of adjacent teeth, extrusion of opposing teeth, irregular arrangement of teeth, and even disturbances in the masticatory system, oral hygiene, phonetics, and aesthetics.3

Denture prostheses are used as a rehabilitation tool to restore stomatognathic function in cases of tooth loss.4 One kind of dental prosthesis is fixed partial dentures in the form of conventional bridge construction either with full or partial crown retainers. However, in conventional bridge construction, there is quite a lot of tissue removal on the abutment teeth, so a more conservative alternative is made, which is adhesive bridges or resin-bonded fixed partial dentures (RBFPD).5

According to the prosthodontic glossary, a resin-bonded fixed partial denture (RBFPD) is defined as a minimally invasive fixed partial denture bonded to the tooth structure, especially enamel, to provide mechanical retention using resin cement.6,7 Historically, these restorations were first introduced in the 1970s and have been growing significantly since then. The first type of RBFPD was the Rochette bridge, which relied on wing-like retainers with funnel-shaped perforations to improve retention. This design combines mechanical retention with a silane coupling agent to provide adhesion to the metal. These perforated retainers became the standard design for several years.8 It is thought that the resin cement can escape through the perforated frame, thereby increasing occlusal forces as well as abrasion and leakage. This condition can reduce the service life retention rate of the bridge. In an effort to overcome this, a micromechanical retention method was developed with the Maryland Bridge.8

The term 'Maryland Bridge' resulted from the development of a type of electrochemical etching at the University of Maryland. This is an attempt to maintain a robust wing with reduced thickness and provide better retention for minimal preparation. This design adapts the electrochemical pitting corrosion technique of non-precious alloy surfaces.8

Adhesive bridge retention has recently been improved by the development of resin cement that chemically bonds to the tooth surface with a metal alloy or zirconia framework.9 To increase the adhesive bridge’s retention, a cast mesh design was developed. This technique produces roughness on the surface of the bridge intaglio retainer before casting the alloy or using a non-etching method after casting the alloy. Nets such as nylon mesh were made on the lingual surface of the abutment teeth in the working model, then a wax pattern was made,
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Case Report

A 29-year-old man presented to the Prosthodontics Department Padjadjaran University Dental and Oral Hospital with condition of missing a central incisor in the lower right jaw due to an accident. The patient complains of discomfort when chewing food and a lack of confidence because the loss of teeth in the front area greatly interferes with the patient's appearance related to his work, which meets many people. The patient wanted to have a fixed denture that could not be removed, but the patient refused if there was too much tooth tissue to be taken as an abutment, so a treatment plan was made for the manufacture of an adhesive bridge with a mesh design in the anterior region of the right lower jaw.

The initial impression was carried out to get a study model and make a wax-up design figure 2A and figure 2B. The pontic design in region #41 was a modified ridge-lap, the retainer wing extends on the lingual surfaces of teeth #31 and #42, and the restorative material to be used was porcelain fused to metal (PFM).

The next step was a reduction of the mesial and distal surface teeth #31 and #42 by as much as 0.5-1mm and the palatal portion 0.5mm. The collar form was supragingival chamfers on the enamel. Followed by a pick-up impression using elastomeric material to obtain a working model. Laboratory processing was carried out in the form of making metal copping with mesh on the intaglio area of the wings figure 3A and figure 3B, and continued with porcelain coating on the pontic figure 4.

After the trials were carried out, the cementing stage was continued using resin cement, as shown in figure 5A and figure 5B. The surfaces of the abutment teeth to be etched were cleaned with pumice, dried, and isolated. Apply phosphoric acid to the enamel surface for 30 seconds, spray the tooth slowly with water until it is clear from the etching material, and dry it with air. The primary bonding agent was applied to the inner surface of the retainer wing, and the bonding agent was applied to the abutment teeth, and then it was irradiated. Next, mixed the adhesive cement and applied it to the inner surface of the retainer wings and abutment teeth. The adhesive bridge was inserted into the abutment teeth in the direction of installation and fixed in place with the fingers. Excess cement was removed, and irradiation was carried out from the edge of the restoration and on the abutment teeth. After that, a re-examination of occlusion was carried out.

Subsequent visits were carried out for control after insertion in periods of 1 month, 3...
Discussion

The underlying principle for adhesive bridge denture restorations is the importance of covering as much of the enamel surface as possible as long as occlusion, esthetics, and the health of the periodontal tissues are not compromised. Early retainer designs followed the concept of an “interproximal seal” developed to overcome occlusal force resistance and provide a larger area for bonding. The enamel preparation consisted of occlusal clearance, placement of the occlusal/cingulum rest, and decreasing the height of the lingual and proximal contours, thereby creating a proximal extension. The three basic principles for achieving good results with adhesive bridge dentures are proper patient selection, enamel modification, and good metal frame design.10

In this case, the patient lost tooth #41, and he wanted to have a fixed denture. The morphology of the mandibular anterior teeth is smaller and thinner in size than the maxillary anterior teeth. An anterior adhesive bridge denture was made to replace the lost tooth #41 with an abutment on teeth #31 and #42.11,12 That patients with small edentulous spans bounded by sound teeth are good candidates for RBFPD.

Tissue removal of 0.5-1mm covers the lingual surface of the abutment teeth and is extended to the proximal of each abutment tooth without passing through the contact point provide maximum coverage but more conservative than conventional bridges with full crown restorations which require more tissue removal. This design also allows for a single path of insertion.13

The collar form of supragingival chamfers in enamel. Restorations made with PFM require strength factors/fracture prevention, and aesthetics. The design consists of a modified ridgelap pontic with the aim of obtaining esthetics in the labial and facilitating cleaning in the lingual. This procedure which describe about the clinical procedures involved in the fabrication of modified metal-ceramic RBFPD, a conservative solution for the restoration of an incisor. The wing retainer design with a mesh on the lingual surface aims to increase retention.7

The patient in this case was satisfied and reported no functional or esthetic problems. This result is in line with the result of Ghavamnashir et al.14 that RBFPD can be used successfully in both the anterior and the posterior teeth to replace one or two missing teeth. The selection of nonmobile abutment teeth, the preparation design that enhances retention and resistance form, and the tooth bonding technique are critical for success.

Conclusion

It was concluded that with the right case selection and appropriate design, anterior adhesive bridge restorations fulfill the retention, stabilization, hygiene, and esthetics, as well as conservative factors. It also restores the masticatory, esthetic, and self-confidence of the patient.

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Conflict of Interest

The authors report no conflict of interest

References

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