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Maryland Bridges: A Conservative Approach to Aesthetic Tooth Replacement – A Case Report

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Abstract:- Restoring missing central incisors in the mandibular jaw is a challenging esthetic challenge in dentistry, especially for younger patients. Maryland bridges are a highly effective treatment option, restoring oral function and aesthetics, and resulting in high patient satisfaction. These bridges have advantages over conventional fixed dental prosthesis, such as minimal removal of the tooth structure, minimal pulpal trauma risk, and reduced time and cost. Provisional restorations are usually not required. Maryland bridges are cemented to the abutment tooth using electrolytic etching to retain the metal framework. The bond is strengthened after etching, and the development of resin cements has enhanced bridge retention. A missing anterior tooth poses an esthetic, functional, and rehabilitative problem, especially for younger patients. Resin bonded bridges are minimally invasive, offering advantages such as minimal removal of the tooth structure, minimal pulpal trauma risk, and reduced time and cost. This case report describes the fabrication technique for a single missing lower anterior tooth, focusing on conservative, economical, and esthetic treatment outcomes.

Keywords:- *Maryland Bridge, Minimally Invasive, Congenitally Missing Teeth, Resin – Bonded Fixed Partial Denture.*

I. INTRODUCTION

The mandibular anterior incisors can be replaced with a variety of treatment methods, including implants, removable partial dentures, and fixed partial dentures. Removable partial dentures can be used as an interim prosthesis for initial aesthetics, but prolonged usage may result in bone resorption and flattening of the interdental papillae. Conventional bridges need sufficient tooth preparation on all abutment tooth surfaces, which can cause pulpal damage and hypersensitivity in young adults. A less invasive and more conservative resin-bonded prosthesis could be an alternative treatment option for such conditions because of the large pulp chambers and insufficient enamel. It would replace the lost tooth while preserving the soft tissue and alveolar ridge that remain.[1]

The Maryland Bridge was developed at the University of Maryland. It is a type of fixed dental prosthesis known as resin bonded or resin retained bridges (RBBs/RRBs), which are bonded directly to the tooth structure with the aid of resin cement and require very little tooth preparation beyond the enamel surface. These restorations offer micromechanical retention and are mostly dependent on resin cement. Reducing strains at the bonding interface to improve retention and resistance is the primary objective of tooth preparation and framework extension.[2] Resin-bonded bridges need considerable treatment planning and technical skills; they are not a no-prep procedure.[3]

This clinical report describes the minimally invasive procedure to replace congenitally missing lower anterior tooth with resin- bonded Maryland bridge.

II. CLINICAL REPORT

A 20 years old female patient reported to our department with a chief complaint of missing lower anterior tooth since birth and unesthetic appearance due to missing tooth. Patient gave history of completed orthodontic treatment several months back. Intraoral examination revealed fixed palatal retainer in the maxillary arch and congenitally missing mandibular canines, thus spacing between mandibular central incisors (Fig. 1, 2,3).

The patient was given the option of traditional fixed partial dentures, resin-bonded fixed partial prostheses, or implant-supported fixed prostheses as treatment alternatives. Due to financial constraints, the patient was unwilling to have an implant-supported prosthesis; thus, a resin-bonded fixed prosthesis was selected as the treatment choice because it was conservative and affordable for the patient.

The abutments (#31 and #41) required minimal tooth preparation using the conventional method just on the lingual surfaces. The abutments' linguo-proximal line angles were carefully observed in order to prevent the preparations from extending beyond them. A light chamfer finish line was produced 1 mm supragingivally, and the gingival preparation concluded 1 mm from the incisal edge. Each preparation's surface facing the edentulous space had parallel retentive grooves created (Fig. 4). The polyvinyl siloxane impression material (Zhermack Hydrorise light body and putty) was used to create the final impression and were then sent to the lab for fabrication of the prosthesis.

The Vita 3-D Master shade guide was used to choose the shades. After the fabrication of the nickel-chromium metal framework and try-in, ceramic buildup was completed. The prosthetic had been polished, glazed, and completed (Fig. 5). Universal self-etch resin cement was used to cement the

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repair into place (Rely X U100, 3M ESPE, Germany) (Fig. 6). The occlusion was checked for interferences and confirmed in both centric and eccentric mandibular positions (Fig. 7). The patient received post-cementation instructions and was monitored on a regular basis (Fig. 8).

III. DISCUSSION

The minimally invasive method using a resin-bonded Maryland bridge was the recommended treatment for congenital partial hypodontia rehabilitation, while there are alternatives as well. Numerous references in the literature provide favourable outcomes from the Maryland Bridges.[4,5] When replacing missing teeth with a traditional fixed partial denture, all of the adjacent teeth's surfaces are typically prepared as abutments. The use of traditional fixed prostheses was not possible in this case due to the patient's age, the large pulp chambers in the abutments, and the anticipated change in the gingiva's position.[1] Although the retention and life lengths of these resin-bonded restorations are reduced, more recent self-etch adhesive solutions help to guarantee that these restorations are kept in place for a reasonably long time.[6,7]

With the development of novel resin cements that chemically link to the tooth surface and the etched metal alloy, the retention of the resin-bonded prosthesis has improved.[3] The Maryland Bridge is held in place by means of micromechanical retention. Maryland Bridges can only be used with nonprecious metals since precious alloys cannot be etched to achieve the micromechanical retention.[8]

Maryland Bridges' efficiency is influenced by a number of factors, including technical considerations, retainer wing coverage, vertical depth grooves, and the choice of abutment and case. If all of these elements are balanced and in harmony, Maryland Bridges' success rates can increase.[9] The three most frequent issues with resin-bonded prostheses are cavities (7%), tooth discolouration (18%), and debonding (21%).[10] Caries and periodontal disease are biological causes of Maryland bridge failure; however, they are not common. Oral health education that includes fluoride usage, nutrition recommendations, and instructions on oral hygiene is necessary to prevent complications.[11,12]

Following six months, debonding was not a problem. The patient's parents were told not to allow their child to bite anything that could break away from their front teeth. The effectiveness of this therapy was further enhanced by maintaining good oral hygiene. Thus, in young patients, a Maryland bridge is a successful treatment option for replacing a single missing tooth.

IV. CONCLUSION

The Maryland bridge is a popular conservative restoration option that is both aesthetic and less invasive, causing less damage to abutment teeth, requiring less chair time, and being less expensive. It is well-received by young patients and can be used as a therapy alternative. Resin bonded bridges are effective in replacing missing teeth, restoring aesthetics and oral function, and ensuring high patient satisfaction. The bridge has undergone alterations since its introduction in 1980, but its basic advantage remains. Improvements in retention, grooves, labial wrap, and enamel coverage have improved its properties. With careful attention to detail and proper case selection, the Maryland Bridge will continue to be a popular choice for conservative restorations.

REFERENCES

[1]. Ahmad M, Naim H, Adawi AM, Siddiq A, Mayidi HM, Hakami YH. A conservative approach to replace missing teeth in the aesthetic zone with Maryland bridge – a case report. Dent Oral Craniofac Res. 2017:3:1-3.
[2]. Howe DF, Denehy GE. Anterior fixed partial dentures utilizing the acid-etch technique and a cast metal framework. J Prosthet Dent 1977; 37: 28-31.
[3]. Burgess JO, McCartney JG: Anterior retainer design for resin bonded acid-etched fixed partial dentures. J. Prosthet. Dent. 1989 Apr; 61(4): 433–436.
[4]. Saunders WP: Resin bonded bridgework: a review. J. Dent. 1989 Dec; 17(6): 255–265.
[5]. Balasubramaniam GR: Predictability of resin bonded bridges – a systematic review. Br. Dent. J. 2017 Jun; 222(11): 849–858.
[6]. Shilingburg HT, Hobo S (1997) Fundamentals of fixed prosthodontics, 3rd edition, Quintessence Publishing Co Inc, IL, USA.
[7]. Jenkins CB (1985) The bond strength of new adhesive recommended for resin-bonded bridges. J Dent Res 64: 664.
[8]. Chan AWK, Barnes IE: A prospective study of cantilever resin bonded bridges: An initial report. Aust. Dent. J. 2000 Mar; 45(1): 31–36.
[9]. Durey KA, Nixon PJ, Robinson S, et al.: Resin bonded bridges: techniques for success. Br. Dent. J. 2011 Aug; 211(3): 113–118.
[10]. Goodacre CJ, Bernal G, Rungcharassaeng K, YK Kan J. Clinical complications in fixed prosthodontics. J Prosthet Dent. 2003; 90: 31-41.
[11]. Pjetursson B E, Tan W C, Tan K, Bragger U, Zwahlen M, Lang N P. A systematic review of the survival and complication rates of resin-bonded bridges after an observation period of at least 5 years. Clin Oral Implants Res2008; 19(2):131–141.
[12]. Negi P, Jaikaria A. Rehabilitation of patient with missing anterior tooth with Maryland bridge: A case report. Int J Res Rev. 2020;7(6):1-3.

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FIGURES

Fig 1 Maxillary Arch

Fig 2 Mandibular Arch

Fig 3 Spacing between Mandibular Incisors

Fig 4 Tooth Preparation on the Lingual Surfaces (#31 and #41)

Fig 5 Polished, Glazed, Labial view of the Final Prosthesis

Fig 6 Lingual view of the Cemented Final Prosthesis

Fig 7 Frontal view of the Cemented Prosthesis

Fig 8 Intraoral Pre and Post op view of Maryland Bridge