

Removable dental prosthesis as periodontal treatment method

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ABSTRACT

The objectives of prostheses are to restore mastication force, improve esthetics and maintain gingival health. The construction and function of prosthesis restoration are mutually interdependent with condition of periodontal tissues. A properly constructed prosthesis is an integral phase of complete treatment of periodontal disease in order to maintain periodontal tissues health. This paper reports case of a man aged 47 years who came to Dental Specialist Clinic in Oral and Dental Hospital Faculty of Dentistry Universitas Padjadjaran with chief complaint of mobility in almost all his teeth and they seems to look longer. The patient has no systemic disease and did not want his teeth to be extracted. Clinical and panoramic radiographic and laboratoris examinations has been done. During treatment, oclusal adjustment and splinting had been done on tooth 33,34,35 and tooth 44,43 also tooth 43,42 splinting with composite. The following treatment was the acrylic removable partial denture for upper jaw while mandible was fitted a frame denture which functioned as a semi permanent splint. One month post treatment, patien felt comfort and the denture was well functioning.

Key words: Periodontal prosthesis, periodontal diseases

INTRODUCTION

The objective of prosthesis is to recover mastication force, improve appearance, prevent displacement, rotation, tilting, opposite tooth extrusion, maintain gingival health and to recover phonetic functions.¹

Dental prosthesis treatment and design is started by overall medical and dental anamnesis. The complete oral examination includes clinical and radiographic interpretation towards existing dental condition, periodontal condition and existing dental occlusion relationship should be evaluated visually. Dental prosthesis made during unhealthy periodontal tissue period will be less

useful and will make periodontal tissue damage more severe. The objective of mouth preparation is to improve the structures inside the mouth so that beneficial condition for dental prosthesis making will be achieved.²

Dental prosthesis making to replace lost natural teeth can be done in removable manner and fixed manner, depends on existing dental condition.³ A dental prosthesis designed without paying attention to the reaction received by periodontal tissue will trigger periodontal disease and premature dental loss.

The objective of periodontal treatment is to regain healthy dental support structure to create the environment and maintain periodontium

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tissue.¹ It is important to know the principles related to the connection between dental prosthesis and periodontal health.² Dental prosthesis making as periodontal therapy aid, periodontal treatment as the aid for prosthesis restoration, periodontal failure related to dental prosthesis and prevention treatment efforts.

The reasons for periodontal therapy before doing prosthodontic treatment is to achieve comfort, good function, long lasting use, dental prosthesis maintenance and periodontal health that should be attend to. Periodontal disease should be cured before making dental prosthesis. Tooth instability and annoying pain will disturb mastication and function of the dental prosthethic. The presence of inflammation will reduce the ability of supporting teeth to receive restoration. The dental prosthesis made on model produced from unhealthy gingiva and mucosa impression will not adapt perfectly with the soft tissues. Dental prosthesis does not only replace missing teeth but also important to create environment that functions to support the health of the periodontal tissue of the existing natural teeth.^{1,2,4}

In patients with treated periodontal abnormality, artificial teeth or dental prosthesis will support periodontal health. Tooth instability is an indication of the periodontium tissue condition and is usually caused by inflammatory change of periodontal ligament, occlusion trauma, loss attachment or combination of the three factors.⁴

Periodontal treatment that precedes removable dental prosthesis restoration is divided into 2 phases, periodontal inflammation control with non surgical and surgical approach and pra-prosthesis periodontal surgery.⁵ The general treatment sequence to prepare the periodontium for restoration: active disease control including emergency treatment, dental extraction, oral hygiene instruction, scaling-root planing, reevaluation, periodontal surgery, additional orthodontic therapy; preprosthesis surgery includes mucogingival problem management, ridge morphology after dental extraction, crown lengthening procedure, alveolar ridge reconstruction. Splinting can be done using external device, intracoronal device or cast restoration to combine several teeth in order to improve dental stability. Occlusal adjustment for

premature contact should be corrected before the dental prosthesis is made to remove disturbing forces that will damage dental support tissue.

Splint is a device used for immobilization or stabilizatoin of teeth experiencing trauma or disease. Periodontal splint is classified as follows.^{2,4,5} Temporary splint, it is only used for limited time period to enable physiological rest and prevent sever instability during recovery period. Permanent splint, it is used for constant treatment in maintaining periodontal tissue health. Provisional (diagnostic) splint, it is used for an uncertained period of time to get opportunities for periodontal improvement and as dental prognosis of doubted teeth.

Splint can be in the form of fixed or removable splint and is classified based on the construction type into external and internal splint. Permanent splint applied on the teeth that have received previous periodontal treatment may replace periodontal prosthesis.⁶

CASE REPORT

A 47 year old male who worked as an entrepreneur came to the Dental Specialist Clinic in Oral and Dental Hospital Faculty of Dentistry Universitas Padjadjaran with a complaint of unstable teeth which seemed longer. He did not want the teeth to be extracted. He wanted that the existing teeth be treated and a prosthesis for upper and lower jaw be made.

Clinical examination: Almost all tooth unstable was in the range of grade 2-4 with much calculus in all regions, gingiva was red, swollen and easily bled with poor oral hygiene. On the upper jaw, the 17, 23, 25, 27 teeth were lost and the 15, 14, 13, 12, 11 teeth were instable, grade 3. The 21 tooth was unstable and experienced extrusion, the 25 and 27 teeth were unstable with grade 3 and grade 2, respectively.

On the lower jaw the 36, 37, 46, 47 teeth were lost and the 38 tooth experienced mesial tipping. The 35, 34, 33, 32 were unstable with grade 3 instability and extrusion, the 42, 43 teeth were unstable with grade 2, the 41, 44, 45, 46 teeth experienced grade 3 instability and the 48 tooth experienced mesial tipping. Traumatic occlusion was found in 21, 41 and 13, 43 and 27,38.



Figure 1. Dental condition after periodontal treatment.



Figure 2. Maxillary and mandibular work model.



Figure 3 a. Upper dental prosthesis; b. lower dental prosthesis.



Figure 4. Maxillary and mandibular dental prosthesis.



Figure 5. One month after dental prosthesis was attached in the mouth.

Radiograph examination: From panoramic radiograph it was seen that almost all upper and lower alveolar bone experienced severe resorption. Laboratory analysis showed no systemic abnormality.

Treatment plan: oral hygiene instruction, extraction of 16, 21, 31 teeth; scaling and root planing; Occlusal adjustment of 43, 38 teeth; Splinting using composite for 33, 34, 35

and 44 teeth, 43 and 43, 42 teeth; Maxillary and mandibular impression for making acrylic removable dental prosthesis to replace 17, 16, 21, 23, 24 teeth with a clasp on 26 tooth because on the right side the tooth is instable so clasp cannot be applied, buccal wings on 15,14 teeth is going to be applied instead. Making metal frame dental prosthesis with prosthesis periodontal splint to replace 36, 32, 31, and 46 teeth.

DISCUSSION

Periodontal therapy conducted before dental prosthesis treatment is one of the mouth preparations or preliminary rehabilitations that are aimed at improving structures in the mouth to achieve beneficial condition for dental prosthesis treatment.

Every tooth should be evaluated for instability, the normal dental mobility is 0.05-0.1 mm. Grade 1 instability is found when there is buccolingual movement of less than 1 mm; Grade II is found when there is a buccolingual movement of 1-2 mm, and Grade III is found when there is a buccolingual movement of more than 2 mm and/or a vertical/occlusal movement is found.⁴

When the etiological factor is removed in the case of teeth with grade I and II instability, the teeth may resume their stability and can be used properly to add support, stabilisation, and retention of removable dental prosthesis.⁴

In this case, all dental instability was in the Grade III and all etiological factors have been removed with scaling and root planing since patient refused to have his teeth extracted. Furthermore splinting of 33, 34, 35 teeth and 44, 43 and 43, 42 teeth with composite was performed (Fig. 1).

When the periodontal tissue is damaged because of a disease, the teeth can be splinted to distribute occlusal force so that the force will not exceed the capacity that can be accepted by the supporting structures.⁴ In periodontal treatment, splint is used when after scaling, and grade II instability is still found.

Splint indication^{2-5,7}: To stabilize unstable teeth and periodontal tissue damage; help healing by reducing traumatic functional forces after periodontal treatment; fixing the teeth to prevent instability; maintain the teeth in the achieved positioned during orthodontic treatment to prevent pathological migration; prevent trauma due to bruxism; periodontal tissue short term trauma caused by periodontitis treatment.

According to Rateitschak⁵, Grade II instability without increased instability does not need splinting. For teeth that experience instability due to occlusion trauma an occlusal adjustment should be performed instead of splinting treatment.⁵ Dental prosthesis is not only a device to replace missing teeth, the main function is to

create conducive functional environment for the periodontal health of the existing natural teeth. In patients who are free from periodontal disease, the dental prosthesis functions to prevent pathological changes. However, in patients after periodontal treatment, the dental prosthesis plays a role to maintain the health of periodontal tissue and to prevent disease recurrence.²

The reason for periodontal treatment before making dental prosthesis is that because dental instability will disturb mastication. The presence of inflammation will reduce the tooth ability in receiving masticatory load. Therefore, the presence of dental prosthesis can help stimulating periodontal function because malfunction may damage the unhealthy periodontal tissue and the tooth may be lost prematurely.^{2,4}

Dental prosthesis made on a model based on the impression of inflamed gingiva and mucosa will be inaccurate because when the inflammation is removed, gingiva will shrink creating a space under the saddle of removable dental prosthesis. After oral hygiene instruction, scaling and root planing, occlusal adjustment, splinting with composite, unavoidable dental extraction and evaluation was done, impressions of upper and lower jaw were made. On the upper jaw, an acrylic removable partial dental prosthesis was made based on economic consideration including the fact that when the instability of the natural tooth becomes more severe, additional artificial teeth can be added to the existing prosthesis. The design of the dental prosthesis includes a clasp on 27 tooth and for 14, 15 teeth, no clasps were made, only buccal acrylic wing surrounding the teeth were applied (Fig. 3a).

On the lower jaw, a metal frame dental prosthesis was made and functioned as a satisfactory semi permanent splinting prosthesis. Removable prosthesis has an advantage in terms of comfort because it can be removed and re-attached. Continuous clasp construction was made on the labio-buccal and lingual part that included all existing teeth to get maximum stability (Fig. 3b).

The function of dental prosthesis and its relationship with periodontal tissue: prevent dental mesial and distal displacement, lateral pressure, impaction of food residual and pocket development, prevent dental extrusion, divide

masticatory load especially because most of the existing teeth were in the anterior area, return efficiency of overall mastication, give stabilization force with splint mechanism so that the natural teeth can function well.²

CONCLUSION

Dental prosthesis will not only replace missing teeth but also create an environment that will help the periodontal tissue and existing dental health. In patients with treated periodontal abnormalities, dental prosthesis can help maintaining periodontal health. The production of dental prosthesis and periodontal tissue condition has a relationship that supports each other.

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