Comprehensive Non Surgical Treatment Of Periodontitis Stage II Grade A : a Clinical Case Report

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ABSTRACT

Introduction: Periodontal disease is a bacterial infection of the periodontal tissue that causes inflammation, progressive loss of attachment, and bone loss. Treatment intended for halting the progression of disease, returning the dentition to a state of health and comfort both functionally and aesthetically. Aim of this case report is to present comprehensive treatment with an interdisciplinary approach.
Case Report: A 22-year-old man came with chief complaints of loose lower tooth and dirty tooth, also gums bleeding easily. From the intra-oral examination was found poor oral hygiene with an OHI-S score 3.4; grade 1 tooth mobility of tooth 12, 11, 21, 22, 32, 42, grade 2 tooth 31.41; fenestration in the labial region 41; Ellis fracture grade 1 tooth 13, grade 2 tooth 12, 11, 41, grade 3 tooth 21; and gangren radix of tooth 46. The diagnosis of this case was Periodontitis stage II Grade A active condition with no risk factors. Case management includes initial therapy with scaling, root planing, tooth extraction, tooth restoration, root canal treatment, splinting and occlusal adjustment, also followed by restorative therapy with removable partial dentures.
Discussion: Patients with periodontitis will always have periodontitis. The characteristics of periodontitis are irreversible, therefore treatment for periodontitis is aimed to stabilize the periodontal tissue, followed by restorative treatment as part of comprehensive treatment. ***Conclusion:*** Comprehensive non-surgical treatment for Periodontitis Stage II Grade A can restore the function and aesthetic of the tooth and mouth.

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INTRODUCTION

Periodontal disease is a bacterial infection of periodontal tissues, leading to inflammation, progressive attachment loss, and bone destruction.[1] According to Riskesdas 2018 data, the percentage of periodontitis cases in Indonesia is 74.1%, affecting all age group, this indicates that people in Indonesia from ages 15 to 65 and above experiences periodontitis.[2] The main etiological factor of periodontal disease is plaque bacteria, which is mineralized into calculus, providing an ideal places for microorganisms to colonize. Periodontal tissue damage occurs due to an imbalance between bacterial factors and the host's immune reactions.[3,4] In early stages, periodontal disease are considered asymptomatic, ranging from slight inflamed gum and bleeding on probing, this condition is known as gingivitis. Untreated gingivitis can progress to more severe stages, resulting formation of periodontal pockets, bone loss, and tooth mobility, this condition is known as periodontitis.[3]

Non-surgical treatment has remained the fundamental treatment as an initial periodontal therapy.[5] The American Association of Periodontology (AAP) Practice Guidelines defines non-surgical treatment as an initiation of a comprehensive control bacterial plaque, management of periodontal-systemic interrelationships, and thoroughly eliminate local factors. The goal of treatment is to halt disease progression and restore the condition of the tooth to a state health and comfort, both functionally and aesthetically. In some cases of periodontal disease, non-surgical treatment alone is sufficient to restore periodontal health.[1] Non-surgical periodontal treatment is still the "gold standard" as a basis for assessing treatment before considering other treatment options.[6-9] This case report aims to present a comprehensive non-surgical treatment for a patient with Periodontitis Stage II Grade A, using an interdisciplinary approach result an optimal functional and aesthetic outcomes.

CASE REPORT

A 22-year-old male patient came to Moestopo Dental and Oral Hospital with complaints of loose lower teeth, feeling of dirtiness in all teeth, accompanied by bleeding gums when chewing, brushing teeth, and having food stuck. The upper front teeth also felt painful when biting hard food and were sensitive when consuming hot, cold, and sweet items. The patient has a history of falling off from motorcycle two years ago, which caused the loose teeth. There is no history of systemic diseases, and he consumes alcohol 3-4 times a week.

Extraoral examination revealed an asymmetric face, no swelling, competent lips, and no palpable or painful submandibular and sublingual glands, along with clicking in the left Temporomandibular Joint (TMJ). Intraoral examination showed gingival inflammation with bleeding upon probing in a generalized manner (80%), with an average pocket depth of 4-6 mm. Plaque and calculus accumulation was found supragingival and subgingival across the arches, with an OHI-s score of 3.4 indicating poor oral hygiene status (Figures 1a-d). There were grade 1 mobility of teeth 12, 11, 21, 22, 32, 42; grade 2 mobility of teeth 31 and 41; fenestration in the labial region of tooth 41; Ellis class 1 fracture in tooth 13 (vital), class 2 fractures in teeth 12, 11, and 41 (vital), and class 3 fracture in tooth 21 (vital); and root involvement in tooth 46. Radiographic examinations were performed, as shown in Figures 2, 3a-d. Based on the history, clinical examination results, and radiographic findings, the patient was diagnosed with Periodontitis stage II Grade A in an active condition with no risk factors according to AAP 2018.

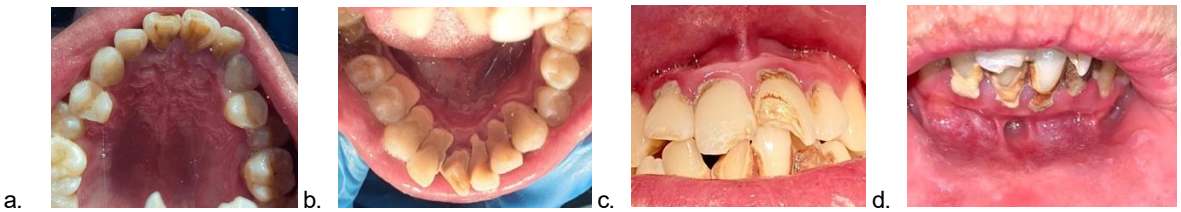

Figure 1. a. Occlusal view of maxilla; b. Occlusal view of mandible; c. Anterior of maxilla; d. Anterior of mandible with fenestration of regio 41.

Figure 2. Panoramic of the patient.

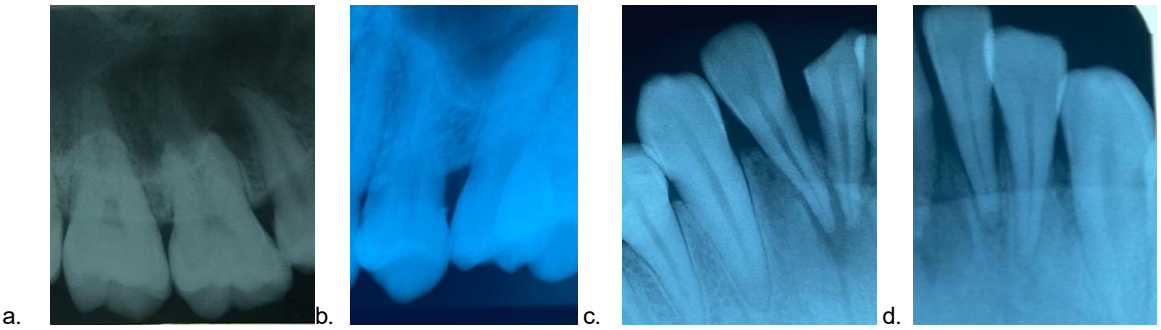

Figure 3. a. Periapical radiograph of teeth 17,16; b. teeth 24, 25; c. teeth 43,42,41 ; d. teeth31, 32, 33. Radiograph interpretation shows alveolar bone loss <50% of teeth 32, 31, 42 and >50% of tooth 41.

The treatment plan graphic can be seen in Figure 4. Informed consent was obtained before the treatment started. The treatment plan began with non-surgical care (Phase 1), which involved scaling using an ultrasonic scaler and thorough polishing of the upper and lower jaws, as well as comprehensive education for the patient regarding plaque control. Follow-up was done one week later, which included the extraction of root 46 and tooth 41. The next follow-up was four weeks later for evaluation after scaling; objective examination found pockets measuring 4 mm deep on teeth 17, 16, 24, 25, and 33, with clinical attachment loss of 3-4 mm on teeth 31, 41, 42, 17, 16, 15, and 27, resulting in an OHI-s score of 2.0. Further treatment involved root planing on teeth 17, 16, 24, 25, and 33 using Gracey curettes #5-6, #7-8, #9-10, #11-12, and #13-14. The areas undergoing root planing were irrigated with H_2O_2 solution and rinsed with 0.9% NaCl solution. A 0.2% chlorhexidine mouthwash was prescribed to the patient as part of home care. Intraoral images after scaling and root planing are shown in Figures 5a-c.

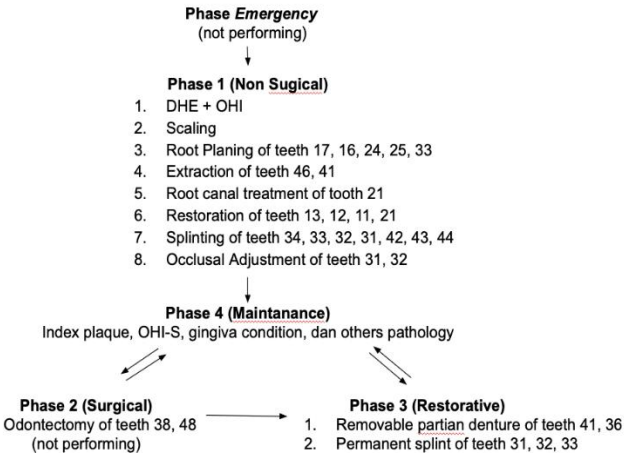

Figure 4. Graphic of periodontal treatment plan.

a. b. c.

Figure 5. a,b,c. Intraoral view after ultrasonic scaling dan root planing.

Treatment continued with temporary splinting using the Essig splinting technique from teeth 44, 43, and 42, combined with a figure-eight technique on tooth 31. This was followed by Essig splinting on teeth 32, 33, and 34, and then an occlusal adjustment was performed through selective grinding (Figures 6a, b). Follow-up was conducted three months after temporary splinting, and during the objective examination, grade 1 mobility was still observed in teeth 33 and 32, and grade 2 mobility in tooth 31. Therefore, treatment was continued with permanent splinting using an extracoronal splint made from composite fiber (Figure 6c).

a. b. c.

Figure 6. a, b**.** Temporary splint with wire *of teeth* 44, 43, 42, 31, 32, 33, 34*;* c. Permanent splint of teeth 33, 32,31.

The next visit of the treatment was root canal treatment on tooth 21, diagnosed with pulp necrose accompanied by a periapical abscess and root resorption. The root canal treatment for tooth 21 used ProTaper (Dentsply) hand files with a crown-down preparation technique. The access preparation continued to the root canal preparation up to F3 with a working length of 21 mm. The first medicament used was Ledermix and $Ca(OH)_2$ at each visit, followed by obturation using gutta-percha and the placement of a fiber post, along with final restoration with composite filling. Restoration treatment continued for teeth 13, 12, and 11, diagnosed with reversible pulpitis, where class 4 composite fillings were performed, as shown in Figures 7a-c.

a.  b.  c. 

Figure 7. a. Radiograph tooth 21; b. Insertion of fiber post; c. Final restoration of teeth 13,12,1,21.

The restorative phase (Phase 3) for this patient involved the fabrication of a removable partial denture to replace the missing teeth 41 and 46, with Kennedy Classification Class III Modification 1 (Figure 8a). The denture fabrication began with anatomical impressions using alginate to obtain a working model. A bite registration was created, and the Vertical Dimension (VD) was measured for the patient, followed by the arrangement of teeth. The arrangement of tooth 41 was done overlapping by replacing two teeth for better aesthetics, as shown in Figures 8b and 8c.

a.  b.  c. 

Figure 8. Occlusal view of the mandible with acrylic removable partial denture; b. Replacement of tooth 46; c. Replacement of tooth 41 (labial view).

DISCUSSION

Periodontitis is defined as an inflammatory disease of the periodontal tissues caused by a specific group of microorganisms, characterized by progressive and irreversible damage. The main features include clinical attachment loss, the presence of periodontal pockets, gingival bleeding, and alveolar bone loss, which can be observed through radiographic imaging.[1,10] The new periodontal disease classification according to the American Academy of Periodontology (AAP) 2018 in periodontitis cases, the terms aggressive and chronic periodontitis are grouped into a single category, "Periodontitis." Periodontitis is further characterized by staging and grading. Staging provides information on the severity of the disease at the time of examination and the complexity of treatment, which assessed into four categories (Stage 1-4), based on; clinical attachment loss, amount and percentage of bone loss, probing depth, presence and extent of angular bony defects and furcation involvement, tooth mobility, and tooth loss due to periodontitis. Grading provides supplemental information about biological features of the disease, rate of disease progression, and assessment of the risk disease, which assessed into three levels (Grade A–low risk, Grade B–moderate risk, Grade C–high risk), in addition to aspects related to periodontitis progression, general health status, and other exposures such as smoking or level of metabolic control in diabetes.[11] The diagnosis for this patient is Periodontitis Stage II Grade A, in an active condition with no risk factors. Stage II is determined by an average clinical attachment loss of 3-4 mm, periodontal pockets

<5 mm, 15% bone loss, and no tooth loss due to periodontal disease. Grade A is determined based on the percentage of bone loss compared to the patient's age, patient non-smoker and free from diabetes. This indicates that the progression of the patient's periodontal disease is relatively low.[12] The prognosis for this patient's treatment is favorable due to the ability to control the etiological factors and the presence of adequate periodontal support.[1]

The clinical practice guidelines for the treatment of Periodontitis stages I, II, III, and IV, according to the European Federation of Periodontology (EFP), the first step in therapy is aimed at intervention behavior change by providing education and motivation to the patient to eliminate supragingival plaque bacteria, this includes oral hygiene instructions, mechanical plaque removal, and the management of risk factors that could exacerbate periodontitis, such as smoking cessation, controlling diabetes, exercising, dietary consultations, and weight loss. The second step of therapy (cause-related therapy) is aimed at the elimination the subgingival biofilm and calculus. The first and second step can be performed simultaneously. The outcomes of these steps should be evaluated periodically and reassessed after the periodontal tissues have healed, with no periodontal pockets >4 mm with bleeding on probing or no deep periodontal pockets ≥6 mm. Further treatment should be considered when there are deep periodontal pockets >6 mm. However, if the first two steps are successful, the patient should be placed in supportive periodontal care (SPC) to maintain periodontal stability.[13]

The consideration for determining the sequence of periodontal treatment is not only based on the condition of the disease but also on the patient's psychological and aesthetic concerns, as periodontal and restorative treatments are situational and specific to each individual.[1] The treatment in this case report combines first and second step, which known as non-surgical therapy, the "gold standard," as it represents Phase I therapy or cause-related therapy. The goal of non-surgical treatment is to control the main etiology, eliminate local factors and modifying factors that exacerbate gingival and periodontal infections.[1] The treatment begins with providing education and oral hygiene instructions to the patient; followed by infection control to eliminate all plaque bacteria and both supragingival and subgingival calculus, which are the main etiological factors of periodontal disease, through scaling and root planing; reduce local risk factors by extraction irreparable tooth and restoration broken or sharp tooth. Good oral hygiene can be achieved when the tooth surfaces are free calculus, make it easier to control plaque, which is a crucial component of successful periodontal treatment, only through scaling and root planing can improve periodontal tissue, including reduced pocket depths, decreased bleeding on probing, and reduced gingival edema. Similarly with the case report by Neelam et al., who performed non-surgical treatment on patients with severe periodontitis and with routine evaluated, resulted in favorable treatment.[6] Gingivitis patient can revert to a state of health, but a periodontitis patient remains a periodontitis patient for life, even following successful therapy, requires lifelong supportive care to prevent recurrence of disease.[11] Lang and Bartlod stated to restore the attachment and bone in normal level is an unlikely, treatment targets are to control local and modifying factors with minimize inflammation, and stabilize attachment and bone.[14]

Control periodic as a comprehensive evaluation. After 10 months of follow-up visits, the treatment result showed good oral hygiene and reduced gingival inflammation with a sulcus depth of 3 mm without bleeding on probing. SPC is provided consistently at each visit. Patients might need retreatment if periodontal disease recur, and for this reason an accurate diagnosis and appropriate treatment is important. Oral hygiene instructions and lifestyle modifications are also key components of SPC. The patient can improve their lifestyle by reducing alcohol consumption, as alcohol is a significant factor contributing to clinical attachment loss, pocket formation, and dental caries. Gandhi et al., stated alcohol consumption leads to microbial imbalances in the oral cavity, and the sugar content in alcohol further promotes bacterial accumulation exacerbating periodontal disease.[15]

Another condition that may require retreatment as a result of the assessment during the SPC is tooth mobility. In this case, temporary wire splinting was performed on the mobile tooth to maintain, stabilize, or immobilize the tooth in their functional and physiological positions, preventing further mobility. Splinting does not tighten the loose tooth, but merely helps control the mobility, and once the splint is removed, the tooth will likely become loose again. Tooth mobility can be eliminated by addressing the underlying disease and allowing the regeneration of the supporting tissues, which is the true reduction of tooth mobility.[16] A 3-month follow-up was conducted after temporary splinting, and while some mobility remained, it had decreased, treatment then progressed to phase restorative with permanent extra coronal splinting and the fabrication of a removable partial denture aimed at restoring the patient's anatomical and functional conditions as part of a comprehensive treatment.

CONCLUSION

Periodontitis is an irreversible inflammatory disease of the periodontal tissue. Comprehensive non-surgical treatment of Periodontitis Stage II Grade A can restores both function and aesthetics of the tooth and mouth, however, the key to successful periodontitis treatment remains the maintenance of good oral hygiene.

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