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(CASE REPORT)

Management of Generalized Periodontitis Stage III Grade B with Subgingival Curettage Procedure

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Abstract

Periodontitis is an inflammatory disease of the supporting structures of the teeth that results in progressive damage to the periodontal ligament and alveolar bone. This condition has become a prevalent disease worldwide, with a prevalence rate of 74.1% in Indonesia. In this case, a 24-years-old male patient presented with a complaint of frequent gum bleeding while brushing his teeth for past 2 months. The complaint was not associated with pain. The patient underwent scaling two weeks ago. Objective intraoral examination revealed probing depth greater than 3 mm called true pocket on the interdental surfaces of teeth 11–17 and bleeding on probing (BOP) of 32%. Periapical radiographic examination showed horizontal alveolar bone resorption of approximately 4 mm at the proximal surfaces of teeth 11–17. The diagnosis established was generalized periodontitis stage III grade B. The management for this case was subgingival curettage. Subgingival curettage was performed to remove the inflamed soft tissue from the apical portion of the junctional epithelium to the connective tissue of the coronal bone. The curettage treatment in this case can be considered successful, as the objectives were achieved—elimination of inflammation and the formation of new connective tissue attachment, as observed during the second follow-up visit after curettage.

Keywords: Periodontitis; Probing Depth; True Pocket; Subgingival Curettage; Bleeding on Probing (BOP)

1. Introduction

Periodontal disease is an infection or inflammation of the oral tissues that affects the supporting structures of the teeth. This disease is common worldwide, with severe periodontal disease ranked as the sixth most prevalent condition globally, according to the Global Burden of Disease Study in 2016. The prevalence of periodontal disease is estimated to range from 20% to 50% worldwide [1]. Periodontal disease includes gingivitis and periodontitis. Gingivitis is inflammation of the gingiva that is reversible, characterized by bleeding and swelling of the gums. If left untreated, gingivitis can progress to periodontitis, which is characterized by bone loss and clinical attachment loss [2].

According to the Global Burden of Disease Study in 2017, 796 million people worldwide suffer from severe periodontitis [1]. In Indonesia, the prevalence of periodontitis is reported to be 74.1% [3]. Periodontitis is the result of progressive and persistent inflammation of the supporting tissues of the teeth, leading to clinical attachment loss, alveolar bone loss, and the formation of periodontal pocket. Periodontitis is a multifactorial disease caused by bacteria, host immune-inflammatory responses, local factors, and genetic factors [4]. Local factors include plaque and calculus, the use of partial dentures, fixed prostheses, tooth extractions, the presence of malocclusion, and poor proximal contact. Additionally, behavioral factors such as improper tooth brushing habits and smoking contribute to the disease [5].

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The primary etiological agents of periodontal disease include bacteria such as *Porphyromonas gingivalis*, *Aggregatibacter actinomycetemcomitans*, *Tannerella forsythia*, and *Treponema denticola*. In healthy conditions, the periodontal tissues are capable of controlling bacterial presence through various immune mechanisms. However, when the balance between infection control mechanisms and subgingival biofilm is disrupted, these bacteria can activate the host's innate immune response, triggering an inflammatory response [6]. An uncontrolled host immune response to periodontal infection results in inflammatory resorption of the alveolar bone. Therefore, periodontitis is characterized by deep periodontal pockets, clinical attachment loss, and bone loss [7].

Periodontal disease impacts speech, aesthetics, and mastication, thereby affecting the overall quality of life and well-being [5]. The main goal of periodontal therapy is to eliminate infection and inflammation in the periodontal structures. The subsequent goal is to restore the structure, function, and aesthetics of the affected periodontal tissues [8]. According to Karmakar and Prakash in 2019 [7], appropriate therapy for patients with deep periodontal probing depth is curettage rather than just scaling and root planing. Curettage is indicated when there are shallow pockets with sufficient gingival width and thickness, the presence of suprabony pocket not exceeding the mucogingival junction, to promote new attachment in deep infrabony pocket in accessible areas, or when probing depth remain greater than 3 mm after scaling and root planing [9, 10].

Curettage procedures can be performed using a scalpel (ENAP), chemical agents, ultrasonic instruments, rotary instruments, lasers, or Gracey curettes, with the latter being the simplest technique [10]. The aim of this procedure is to convert chronic lesions into acute surgical wounds to promote healing through marginal gingival shrinkage and the formation of new attachment via epithelial adhesion to the tooth surface [8].

This case report will discuss periodontitis and its management through the subgingival curettage procedure.

2. Case Report

A 24-years-old patient presented to Udayana University General Hospital with a chief complaint of frequent gum bleeding while brushing his teeth for past 2 months. The complaint was not associated with pain. To date, no measures have been taken by the patient to address this issue. For dental history, patient underwent scaling two weeks ago. Intraoral examination revealed an oral hygiene index score of 0.84, categorized as "good," and a plaque index score of 35%. The examination also revealed the presence of periodontal pocket with a mean probing depth of 4 mm, and the highest papillary bleeding index was graded as 3.

Table 1 Intraoral Examination of teeth #11-17

Tooth	**PD (*Probing Depth)* distal-mesial**	**PBI (*Papilla Bleeding Index*) distal-mesial**	**GOI *Gingival Overgrowth Index*) distal-mesial**	**TFO (*Traumatik From Occlusion*)**	**Gingival recesion (distal-mesial)**	**Local Factor**
11	6 5 4	3 2 2	0	-	-	Diastema in distal #11
12	5 3 4	2 0 3	0	-	-	Diastema in mesial #12
13	4 2 3	1 0 0	0	-	-	-
14	5 3 4	2 0 0	0	-	-	-
15	5 2 4	2 0 2	0	-	-	-
16	4 2 5	2 0 2	0	-	-	-
17	3 3 4	0 0 1	0	-	-	-

Figure 1 Pre-operative intraoral image

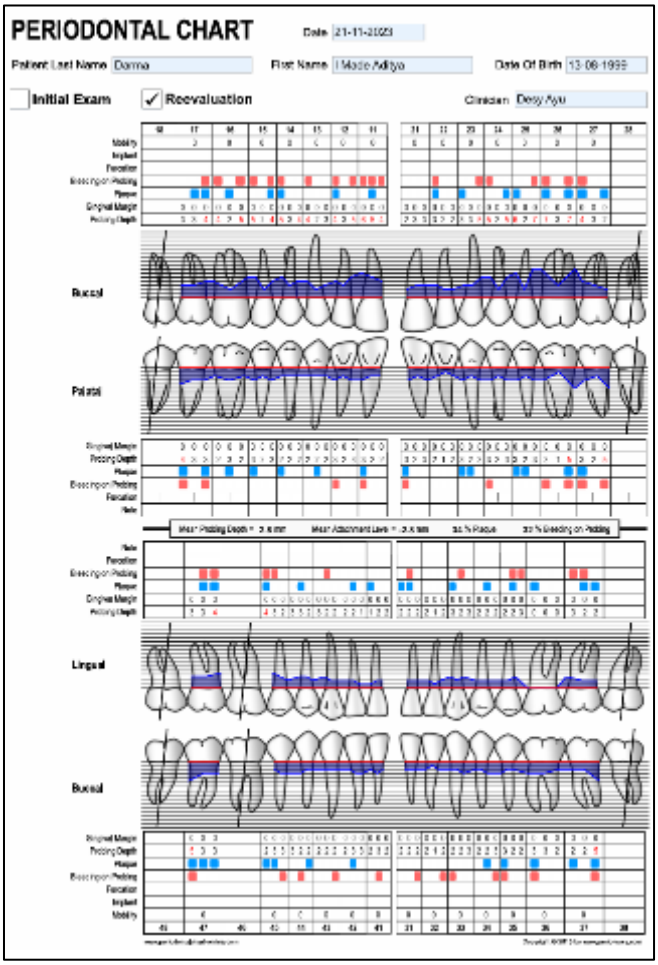

Figure 2 Pre-operative Periodontal Chart

Radiography examination showed that bone resorption occurred almost in all proximal of teeth 11 - 17. There were horizontal resorption with 4 mm bone resorption in proximal teeth 11 – 16 and 2 mm bone resorption in proximal 17.

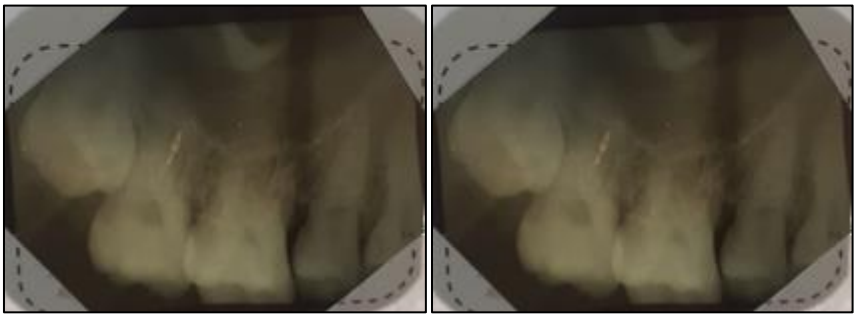

Figure 3 Radiographic examination showed bone resorption on proximal 11-17

Based on examination above, this case was diagnosed as Generalized Periodontitis Stage III Grade B. Treatment choice for this case is subgingival curettage. The treatment was started after checking vital signs and informed consent patient. It was found that the patient vital signs were within normal limits. The curettage procedure began by performing work area asepsis with povidone iodine 10% as antiseptic material. Anesthesia performed by infiltration anesthesia on muccobuccal fold teeth 11-17 with pehacaine. Following this, scaling and root planing were performed using a Gracey curette. Curettage was then carried out by inserting the curette into the pocket until it reached the pocket base, with the cutting edge facing the soft tissue. The non-operating hand stabilized the outer surface of the gingiva using gauze moistened with saline and was applied with gentle pressure. Curettage of the lateral pocket wall was performed using horizontal strokes, scooping motions, and overlapping strokes until all necrotic tissues in the junctional epithelium were removed. Bleeding control is achieved by applying sterile gauze with pressure for 10-15 minutes, followed by adaptation of the gingival tissue with light pressure. A periodontal pack is applied over the surgical area, extending coronally up to the cervical third of the teeth and apically not beyond the mucogingival junction, ensuring it is free from occlusal contact. The patient was then medicated with amoxicillin 500 mg every 8 hours for 5 days and mefenamic acid 500 mg if needed when the patient feels any pain, as well as chlorhexidine gluconate 0.12% mouthwash 2 times a day for a week. Then, the patient was instructed to come one week after surgery to remove the periodontal pack. A periodontal depth examination was performed in 2 weeks and showed the periodontal depth decreased significantly.

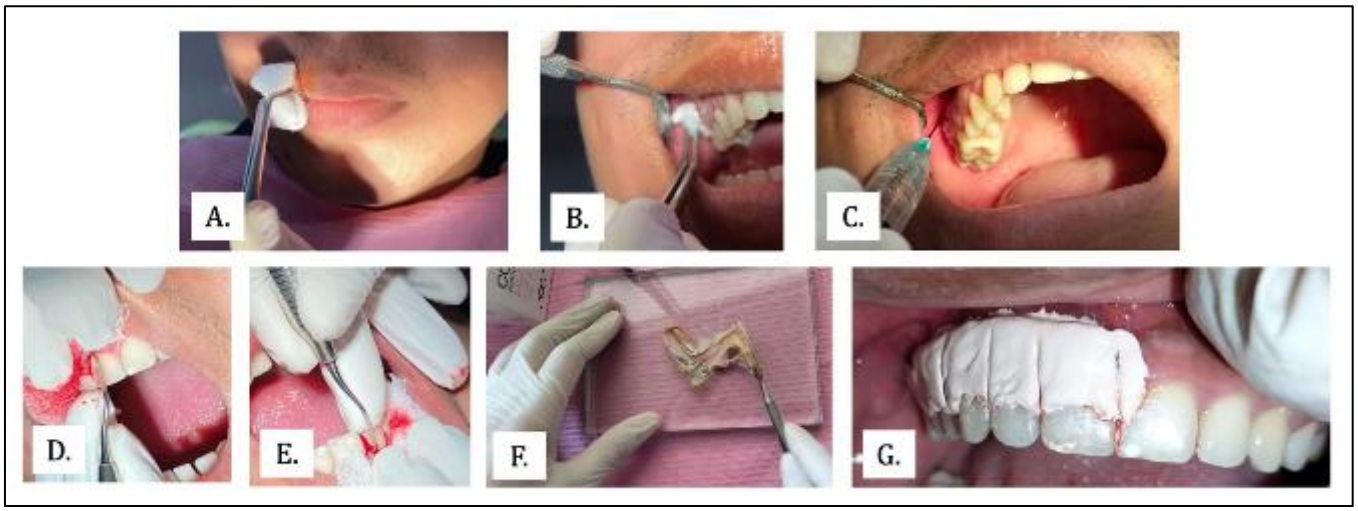

Figure 4 (A,B) Asepsis with povidone iodine 10% as an antiseptic material extra oral and intra oral; (C). Infiltration anesthesia at the mucobuccal fold; (D,E). Subgingival curettage on teeth 11–17 using gracey curette; (F). Periodontal pack manipulation; (G). Periodontal pack application at the surgical site

The first follow-up was conducted one week after the surgery. During the subjective examination, the patient reported no pain or swelling in the surgical area. Extra oral examination revealed no swelling and the patient had no other complaints. Intra oral objective examination showed that the periodontal pack was still in place in the surgical area 1 week after surgery. The periodontal pack was then removed, and any remaining material adhering to the gingiva and interdental areas was cleaned, followed by irrigation with an irrigation solution.

Figure 5 Intra oral examination one week after surgery

The second follow-up took place one month after the surgery. During the subjective examination, the patient again reported no pain or swelling in the surgical area. Objective examination revealed no signs of inflammation, no abnormalities in gingival color, or bleeding. There was no debris (-), edema (-), redness (-), or pain (-). The Oral Hygiene Index Simplified Score (OHI-s) was 1.2 (good) and the plaque index was 13%. A significant reduction in probing depth was noted (as shown in the table), and the average papillary bleeding index was 0.

Figure 6 Intra oral examination one mouth after surgery

Figure 7 Intra oral examination pre-operative (left), follow-up one week (middle), follow-up one month (right)

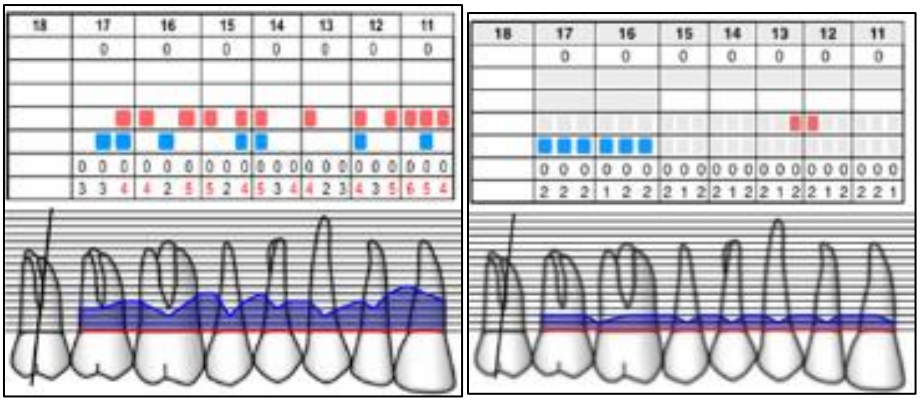

Figure 8 Pre-operative periodontal chart (left), Post-operative periodontal chart (right)

3. Results and Discussion

Microbial imbalance, also referred as dysbiosis, leads to the development of periodontal disease. Dysbiosis occurs due to poor oral hygiene habits, as seen in this case. The plaque biofilm, which becomes mineralized into calculus, serves as a niche for non-calculating plaque accumulation, creating an ideal environment for microorganisms to colonize and metabolize [11]. The pathophysiology of this disease progresses from the initial lesion to the advanced lesion, marked by the formation of pocket and alveolar bone resorption [6].

Pocket can form due to various factors. Behavioral factors, such as improper brushing and lack of flossing, are present in this case, as the patient has not adopted proper brushing habits nor does he perform flossing, leading to the accumulation of calculus. Anatomical factors, such as poor proximal contact, including diastema and plunger cusp, promote food impaction [9]. Food impaction can subsequently irritate the teeth and surrounding tissues, leading to issues such as proximal caries, gingivitis, and periodontitis [12]. This is the case here, where periodontitis is exacerbated by multiple diastema causing food impaction on the distal of tooth 11 and mesial of tooth 12, resulting in plaque and calculus accumulation.

In this case, the periodontitis is classified as Periodontitis Stage III Grade B. The diagnosis of generalized periodontitis was made because more than 30% of the patient's teeth were affected by periodontitis. Stage III was determined due to the presence of the greatest interdental Clinical Attachment Loss (CAL) of 7 mm, and Grade B was assigned because the biofilm deposits were proportional to the level of periodontal tissue destruction.

Initial phase in this case including Dental Health Education (DHE), scaling and root planing, minor orthodontic treatment. The surgical phase performed in this case was subgingival curettage. The main goal of this treatment was to remove chronically inflamed granulation tissue located on the lateral walls of the periodontal pockets. Curettage is not intended to eliminate local factors such as plaque and calculus, therefore, scaling and root planing were performed prior to this procedure.

One week after curettage, a follow-up appointment was scheduled to remove the periodontal pack. The periodontal pack serves as a surgical dressing to protect the tooth-supporting structures from post-operative complications. Meanwhile, the healing of the sulcular epithelium occurs between 2 and 7 day post-surgery. By day 6, the post-operative wound is usually covered with stratified squamous epithelium, and collagen begins to form in the connective tissue. Gingival margin shrinkage starts one week after surgery. By day 16, more dense collagen connective tissue becomes visible. By day 21, increased collagen formation is noted in the connective tissue, the gingiva appears normal, and complete healing is achieved. Based on this, probing was performed during the second follow-up, but not during the first follow-up, to avoid interfering with the epithelial healing process [9,10].

The probing depth at the second follow-up showed significant improvement, with an average probing depth of 2 mm from the mesial of tooth 11 to the distal of tooth 17, and the deepest probing depth was 2 mm. The average Clinical Attachment Loss (CAL) from the mesial of tooth 11 to the distal of tooth 17 was 1 mm, with the greatest CAL being 1 mm.

This indicates that the treatment was successful and consistent with existing theory. According to Karmakar and Prakash in 2019 [7], surgical treatment with curettage for patients with deep periodontal probing depth has shown

better results in reducing pocket depth compared to scaling and root planing alone. Pocket depth reduction through curettage is achieved through the formation of new connective tissue attachment and tissue shrinkage. If probing depth decreases without a change in CAL, it indicates tissue shrinkage. However, if there is a change in CAL, it signifies the formation of new connective tissue attachment [8]. Therefore, in this case, the success of the curettage treatment was achieved through the formation of new connective tissue attachment.

4. Conclusion

This case report presents a case of Generalized Periodontitis Stage III Grade B exacerbated by multiple diastema, diagnosed based on subjective, objective, and radiographic diagnostic examinations. The chosen treatment was subgingival curettage using the basic technique with Gracey curettes, aimed at eliminating inflammation and promoting new attachment formation. The curettage treatment in this case can be considered successful, as the goals of the procedure were achieved—namely, the elimination of inflammation and the formation of new connective tissue attachment, as observed during the second follow-up after curettage.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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