

Case report

Gingival Curettage In Chronic Periodontitis Associated With A Habit Of Unilateral Mastication

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ABSTRACT

Background: Periodontal disease is a significant problem for oral health. Periodontitis refers to inflammation of the periodontal tissues caused by uncontrolled build-up of plaque and calculus. Unilateral mastication habit becomes a predisposing factor that could aggravate periodontitis. **Purpose:** This case report focuses on the management of a patient with stage II, grade A chronic periodontitis resulting from a habit of unilateral mastication. **Case(s):** A 19-year-old female came with a complaint of swollen gums and frequent bleeding when brushing her teeth. An intraoral examination revealed that the gingiva around tooth 43 was swollen and red; the bleeding on probing (BOP) test was positive; probing depths were 5 mm distally, 4 mm midlabially and 4 mm mesially. **Case Management:** Initial therapy involving scaling and root planing was followed by curettage and the provision of dental health education to help the patient eliminate bad habits. **Conclusion:** Curettage treatment has been effective, as indicated by the gingiva appearing normal and a reduction in pocket depth.

Keywords: chronic periodontitis, gingival curettage, unilateral mastication

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INTRODUCTION

Periodontal disease remains a major oral health concern in Indonesia, accounting for approximately 96,58% of dental and oral health cases. Periodontitis, one of the most common forms of

periodontal disease, affects an estimated 10,5 – 12% of the global population and demonstrates an increasing prevalence with advancing age.¹ Periodontitis refers to inflammation of the periodontal tissues caused by uncontrolled build-up of plaque

and calculus. Periodontitis is an inflammatory process affecting the tissues supporting the teeth, initiated by certain pathogenic microorganisms. This condition is characterized with loss of periodontal tissue attachment, the development of periodontal pockets, and often associated with clinical conditions such as a gingival bleeding.²

Chronic periodontitis is a multifactorial inflammatory disease caused by a complex interaction between subgingival microbiota characterised by dysbiosis and an unregulated host immune response. Initially, the bacterial biofilm accumulation on the tooth surface causes an inflammatory response as the body's protective mechanism against microbial colonization. However, in certain individuals, this immune response is unable to control the microorganisms effectively, thereby causing damage to the periodontal tissues. This condition leads to the loss of periodontal tissue attachment, destruction of the periodontal ligament, the formation of periodontal pockets, and alveolar bone resorption.³ This periodontal condition, characterized by gingival bleeding, the accumulation of supragingival calculus, an increase in periodontal pocket depth on

probing, and the loss of periodontal tissue attachment.⁴

Periodontitis could also initiated by poor oral habits, such as unilateral mastication. The side most frequently used for mastication will experience a higher build-up of plaque and calculus. This contralateral side is at risk of developing caries and periodontitis, whilst the side with excessive plaque and calculus build-up is at risk of damage to the periodontal tissues.⁵

Gingival curettage is a widely used periodontal treatment method for patients with chronic periodontitis and is often regarded as the 'gold standard' treatment. The procedure involves a closed surgical technique performed to remove inflammatory tissue from the walls of the periodontal pocket. The purpose is to improve periodontal tissue attachment by removing the inner layer of the pocket and the junctional epithelium adhering to the tooth root surface using curette instruments. The success of curettage can be assessed by an increase in clinical attachment level (CAL), reduction in periodontal pocket depth, and decrease in bleeding during the Bleeding on Probing (BOP) test.⁶

Overall, the curettage procedure is carried out using sharp instruments, namely Gracey curettes or universal curettes. The procedure is performed under local anaesthesia, with movements resembling the scooping of tissue from the inner surface of the gingival wall. Irrigation is then required to help remove any remaining debris⁷

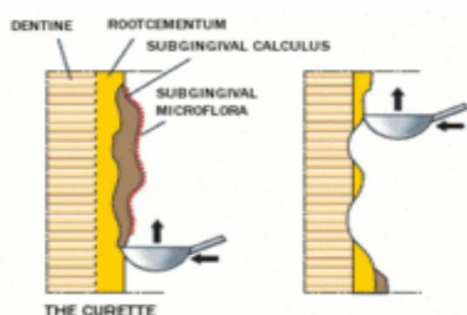


Figure 1. *Curettage*⁷

CASE(S)

A 19-year-old female patient referred to RSGM Soelastri Surakarta reporting swollen gums and frequent bleeding whilst brushing her teeth. She had been experiencing these symptoms in her lower right front teeth for approximately two years; the gums frequently bled when she brushed her teeth and were sometimes painful, and she had never received any dental treatment. The patient had no history of systemic disease, regular medication use, or previous dental treatment. She reported an allergy to prawns, and her family history was non-contributory. The patient has a

habit of consuming sugary foods and frequently chews on one side, namely the left; brushes their teeth twice a day, in the morning and at night; and does not smoke.

The patient's general condition is fair and compos mentis. On extra-oral examination, no abnormalities were found. On intra-oral examination, hyperaemic and oedematous gingivae and bleeding on probing were observed in the lower anterior region. The patient's OHI-S score is moderate at 6 (DI 2; CI 4). Probing depth ranged from 4 to 5 mm at tooth 43. Intraoral photographs of the patient prior to treatment can be seen in Figure 2.



Figure 2. Intraoral photograph taken before treatment

Based on the medical history and clinical examination, the patient has been diagnosed with stage II, grade A chronic periodontitis. The prognosis is generally good as the patient is young, cooperative and has no systemic factors.

The treatment planning consists of initial therapy, which includes educating

and motivating the patient on how to maintain oral hygiene status and reduce unilateral chewing habit. This will be followed by scaling and root planning to address the aetiological factors, and curettage will be performed.

CASE MANAGEMENT(S)

During the first visit, the patient received dental and oral health education (DHE) regarding the dental problems encountered, explaining that these conditions were caused by the accumulation of plaque and calculus resulting from the build-up of food debris that was rarely cleaned away. This condition is aggravated by the patient's habit of frequently consuming sugary foods and masticating predominantly on the left side, resulting in a greater build-up of calculus on the right side. The patient was asked to sign an informed consent form for scaling and root planing (SRP) as the initial treatment to address the underlying cause. An evaluation was scheduled at a follow-up visit seven days after the initial treatment.



Figure 3. Intraoral photograph taken after initial therapy

The second visit conducted one week after the initial therapy, where the patient's oral hygiene was found to be good (Figure 3), but the patient still experienced bleeding gums when brushing their teeth. Upon objective examination, the gingiva of tooth 43 was still found to be red and oedematous. A probing depth measurement using an UNC-15 probe showed no improvement, with depths of 5 mm (distal), 4 mm (midlabial) and 4 mm (mesial), and positive bleeding on probing (BOP) was noted. Based on these findings, it was decided that curettage would be performed at the next appointment; the patient was informed of the importance of this treatment, and informed consent was obtained as the patient's agreement to the procedure to be carried out.

During the third appointment, a gingival curettage procedure was performed on tooth 43. The procedure began with aseptic preparation of the working area using povidone-iodine. This was followed by topical anaesthesia with benzocaine, then infiltration anaesthesia with 0.5 cc of pehacaine administered into the mucobuccal fold of tooth 43. Thereafter, curettage of tooth 43 was performed using a Gracey curette No. 1-2,

inserting the curette into the gingival sulcus down to the base of the pocket, aligned with the tooth's axis and with the sharp edge facing the gingiva (Figure 4). The outer edge of the gingiva is held in place with the finger not holding the instrument. The curette was then moved in horizontal strokes towards the occlusal surface, removing all necrotic and granulation tissue. The curettage was repeated until all granulation tissue had been removed, as indicated by the emergence of fresh blood and the exposure of a smooth surface. Following this, irrigation was carried out using a NaCl solution to cleanse the area

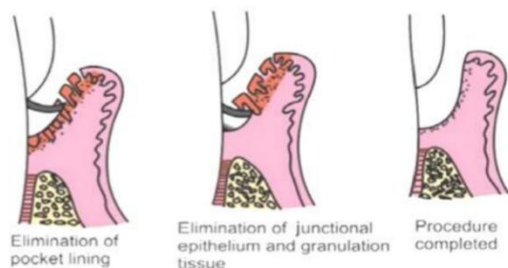


Figure 4. Curettage Procedure⁷

and remove any remaining loose tissue. Bleeding was controlled using a tampon or cotton roll, followed by tissue adaptation by applying pressure to the surgical site with a finger for 1–3 minutes. Once the area is clean and dry, metronidazole gel was applied to the subgingival region to prevent infection.

Once the surgical procedure has been completed, the patient was prescribed

500 mg of mefenamic acid as an analgesic three times a day, to be taken if pain persists, and a course of antibiotics, which must be taken in its entirety. In addition, the patient was given post-operative instructions, such as avoiding hot food and drinks and not consuming any food for 1 hour after the procedure to minimise bleeding, maintaining oral hygiene by brushing their teeth twice a day, rinsing their mouth gently, avoiding touching the treated area, and attending a follow-up appointment 2 weeks after treatment.

The fourth visit was held two weeks after treatment, during which the patient presented with the lower right gingiva, which had improved. On subjective examination, the patient reported no complaints, pain or bleeding whilst brushing the area where curettage had been performed. On objective examination (Figure 5), the gingiva of tooth 43 was found to have improved: no oedema or erythema was observed, and probing depths were 2 mm (distal), 1 mm (midlabial) and 1 mm (mesial). During this final visit, the patient was again advised to maintain good oral hygiene and to eliminate bad habit such as eating sugary foods and chewing on one side only.



Figure 5. Intraoral photograph following curettage

DISCUSSION

Periodontal disease is an inflammatory condition affecting the periodontal tissues, the tissues that support the teeth, which consist of the gingiva, cementum, periodontal ligament and alveolar bone. These tissues have complex biological characteristics and are highly sensitive to various stresses. The aetiology of this disease is multifactorial, with the main causative factors being dental plaque and calculus, and it is influenced by predisposing factors such as age, genetics and systemic diseases.⁸

In this patient's case, there is evidence of excessive calculus build-up on the right side of the jaw, with probing depths indicating periodontitis. The habit of unilateral mastication can affect the periodontal tissues, as the act of masticate has a natural self-cleansing effect. The bad habit of unilateral mastication can adversely influence the condition of the

periodontal tissues. Mastication contributes to a natural self-cleansing mechanism by increasing salivary flow and facilitating plaque removal. During mastication, saliva production increases, thereby helping to maintain the balance of the normal oral flora. If a person masticate on one side only, the self-cleansing effect is more dominant on the actively used side, whilst the other side experiences greater calculus build-up⁹.

Periodontal treatment consists of five phases: the preliminary (urgent) phase, the non-surgical phase, the surgical phase, the restorative phase, and the maintenance phase. The surgical phase of periodontal treatment is an advanced stage indicated when non-surgical treatment fails to achieve optimal results in meeting the treatment objectives.¹⁰

Periodontal therapy typically begins with the first phase of treatment, involving scaling and root planing as an initial therapy to reduce the microbiota and even eliminate clinical inflammation. Following the initial treatment, if pocket depths of 3–5 mm are still present and no improvement is observed, further treatment in the form of curettage may be carried out.¹¹ This case, reports a pocket depth of up to 5 mm even after initial treatment, so curettage was required to address the issue. Curettage is a

periodontal procedure performed to eliminate local factors causing inflammation, with the aim of forming new attachments and reducing pocket depth. The granulation tissue within the pocket needs to be removed as it has the potential to further damage the tissue.¹²

Gingival curettage is more effective at improving clinical attachment, reducing probing depth and inflammation than scaling and root planing alone.¹³ The primary purpose of gingival curettage is to eliminate and reduce periodontal pockets and to support the tissue healing process through the formation of new attachments, thereby restoring the colour, contour, consistency and texture of the surface to a healthy appearance. Curettage is performed using a Gracey curette, whereby the sharp edge of the instrument is directed towards the sulcus epithelium and then moved in a controlled manner along the soft tissue to remove granulation tissue such as proliferative, fibroblastic and angioblastic tissue.¹⁴

Following the gingival curettage, the sulcular epithelium and gingiva will experience a healing process. The mechanism of periodontal tissue healing is, in principle, similar to the general wound healing process, which comprises the

haemostatic phase, the inflammatory phase, the proliferative phase and the remodelling phase. These four phases occur in a continuous sequence.¹⁵ The periodontal tissues will experience a series of repair and healing processes. Regeneration of the sulcular epithelium generally takes place within 2–7 days, whilst that of the attached epithelium takes 5 days. Retraction of the gingival margin occurs within 1 week, and complete healing is achieved within 2–3 weeks following curettage. This healing process depends on several factors, such as systemic condition, the immune system's response, and the patient's level of compliance with oral hygiene.¹⁴ Upon follow-up two weeks after the curettage procedure, the patient no longer complained of swollen gums or frequent bleeding. Objective examination also revealed that the gingiva appeared normal and the pocket depth had returned to normal.

The curettage procedure finished with the application of metronidazole gel to the sulcus of tooth 43. Metronidazole is an antibiotic from the nitroimidazole group which is applied topically and has a bactericidal effect against the anaerobic bacteria that cause periodontitis.¹⁶ The mechanism of metronidazole involves the

diffusion of the drug into bacterial cells, where it then inhibits protein synthesis and interacts with the bacteria's genetic material. This interaction disrupts the helical structure of the DNA and causes damage to the DNA strands, leading to the destruction of the bacterial cells.¹⁷

Successful treatment alone is not sufficient to resolve the problems experienced by patients. Dental health education (DHE) plays a role in improving patients' knowledge and behaviour regarding oral health, thereby ensuring that periodontal health is well managed.¹⁸ Patient education is essential to prevent the recurrence of the condition.¹⁹

CONCLUSION

Chronic periodontitis is caused by multiple factors; one predisposing factor is the patient's habit of unilateral mastication. Initial therapy includes scaling and root planing. Closed surgical procedures, such as curettage, should be performed if there is no improvement following initial treatment. The effectiveness of treatment is determined by the improvement in the condition of the gingiva and the reduction in periodontal pockets in the affected teeth.

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