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Management of Recurrent Aphthous Stomatitis (RAS) Cases Through a Communication, Information, and Education Approach

Diah Rochmayani Tri Lestari[1], Naviatullaily[2]
Fakultas Kedokteran Gigi, Universitas Muhammadiyah Surakarta, Indonesia
Email: j530235056@student.ums.ac.id

Article Info
Corresponding Author
Diah Rochmayani Tri Lestari
Email:
j530235056@student.ums.ac.id

ABSTRACT
Recurrent Aphthous Stomatitis (RAS) is an inflammatory condition of the oral mucosa characterized by recurrent ulcers typically presenting with a yellowish-white base and erythematous borders. These lesions are often painful and may interfere with daily activities. The exact cause of RAS is unknown, although predisposing factors include hormonal disturbances, nutritional deficiencies, and stress. To evaluate the management of Recurrent Aphthous Stomatitis (RAS) caused by hormonal imbalance, nutritional deficiencies, and stress using the Communication, Information, and Education. A 28-year-old woman presented with recurrent canker sores on the right buccal mucosa and the commissure of the upper lip for the past three days. The patient experienced similar complaints every month before menstruation. Intraoral examination revealed two irregular ulcerative lesions, measuring less than 1 cm in size, exhibiting a yellowish-withe base with erythematous border. The diagnosis was established as multiple minor Recurrent Aphthous stomatitis lesions. Through a CIE approach, the patient was educated regarding the mechanisms of RAS, including the role of hormonal changes during the luteal phase, the impact of stress through activation of the HPA axis, and the importance of nutrients such as vitamin B12, folate, and iron in mucosal regeneration. The patient was advised to improve dietary habits, avoid irritant foods, maintain good oral hygiene, manage stress, and ensure adequate hydration. Referral to an obstetrician-gynecologist or nutritionist was recommended when indicated Oral therapy was provided in the form of a multivitamin containing vitamins A, B-complex, C, D, and E, along with minerals. The patient was instructed to take one tablet tablet once daily for 10 days to help improve nutritional status and promote ulcer healin. The management of RAS requires a holistic approach through effective communication, information, and education (CIE) regarding trigger factors and the underlying mechanisms of RAS, combined with supportive therapy and lifestyle modification to prevent recurrence.
Keywords: Recurrent Aphthous Stomatitis, RAS minor, menstruation, nutritional deficiency, stress, CIE

INTRODUCTION

Recurrent Aphthous Stomatitis (RAS) is a type of non-traumatic ulcerative lesion of the oral mucosa that occurs repeatedly or recurs in both children and adults. RAS, commonly

known by the public as canker sores, is a relatively mild condition that is not dangerous and not contagious (Regezi et al., 2015; Surachmin et al., 2024). The prevalence of RAS has been reported to range from 20%–60% across various populations worldwide. Based on the 2018 Indonesian Basic Health Research (RISKESDAS), one of the most common oral diseases experienced by the Indonesian population is RAS, with a prevalence of approximately 8.0%.

Before the onset of RAS, patients commonly experience prodromal symptoms such as a burning sensation accompanied by paresthesia (tingling sensation) and hyperesthesia (increased sensitivity) in the area where the ulcer will later develop on the oral mucosa. Within 1–2 days, RAS lesions usually appear and are often associated with pain and discomfort during activities such as swallowing, speaking, and opening or closing the mouth. Typically, the lesions occur on non-keratinized mucosa such as the soft palate, tongue, and floor of the mouth. The lesions are characteristically round or oval with well-defined borders, yellowish-gray in color, and surrounded by erythematous margins (Aliyah Pradono, 2019). RAS is classified into three types of lesions: minor recurrent aphthous stomatitis, major recurrent aphthous stomatitis, and herpetiform recurrent aphthous stomatitis (Surachmin et al., 2024).

The exact etiology of Recurrent Aphthous Stomatitis (RAS) remains unclear; however, several possible triggering factors have been identified, including genetic predisposition, local trauma, hormonal disturbances (such as during menstruation), nutritional deficiencies, and stress (Surachmin et al., 2024; Widyastutik & Permadi, 2017; Wowor et al., 2019). The immune system, particularly the Th1-type immune response, plays an important role in the early stage of lesion development, which is characterized by a burning sensation occurring 24–48 hours before ulcer formation. This process begins with lymphocyte infiltration into the oral epithelial cells, triggering an inflammatory response that causes erythema, followed by keratinocyte vacuolization and local vasculitis, resulting in swollen white papules. Subsequently, the papules undergo ulceration and appear as yellowish-white ulcers with erythematous borders within 48–72 hours. The lesions are infiltrated by neutrophils, lymphocytes, and plasma cells before eventually healing through epithelial regeneration (Wowor et al., 2019).

This case report describes multiple minor recurrent aphthous stomatitis associated with predisposing factors such as menstruation and nutritional deficiency, as well as the implementation of communication, information, and education approaches for the patient. The patient was informed that the recurrent complaints experienced were known as recurrent canker sores or Recurrent Aphthous Stomatitis (RAS). These ulcerative lesions are non-malignant and not dangerous, although they may recur within the oral cavity. The patient was also informed that the recurrent ulcers in this case were triggered by several factors, including hormonal disturbances, stress, and nutritional deficiencies. Furthermore, the patient was educated on the importance of controlling triggering factors, maintaining adequate nutrition, taking medication according to the doctor's instructions, maintaining oral hygiene, and managing emotional stress. Through these measures, recurrent ulcers or RAS episodes, especially during menstruation, may decrease and recovery may occur more rapidly.

CASE REPORT

A 28-year-old female patient presented to Rumah Sakit Gigi dan Mulut Soelastri UMS with complaints of canker sores on the right inner cheek and the upper inner lip commissure that had persisted for approximately three days. Initially, the patient noticed redness

accompanied by mild pain; subsequently, the lesions turned whitish and became painful, interfering with daily activities such as eating, drinking, and speaking. The patient reported experiencing recurrent canker sores almost every month prior to menstruation. The patient's last dental visit was approximately six months earlier for dental scaling, and one year ago the patient underwent extraction of the lower right tooth. The patient brushed her teeth twice daily, in the morning after breakfast and at night before sleeping.

The patient had no history of systemic disease, allergies (food, environmental, or medication-related), and was not currently taking any medications. The patient stated that her parents did not experience similar complaints. The patient's father had a history of diabetes mellitus, whereas her mother was healthy and had no history of systemic disease or allergies. The patient had a habit of unilateral chewing and occasionally experienced unconscious bruxism. Daily water intake was approximately eight glasses per day. The patient admitted to inadequate vegetable consumption and occasionally experienced stress due to academic workload and educational demands.

Extraoral examination revealed a symmetrical oval-shaped face with no abnormalities in the lymph nodes, and all findings were within normal limits. Intraoral examination demonstrated attrition of the maxillary anterior teeth (13, 12, 11, 21, 22, 23) and mandibular anterior teeth (33, 32, 31, 41, 42). Occlusal enamel caries were observed on teeth 16 and 26. Edentulous areas were noted at teeth 36 and 46, while the patient's oral hygiene status was categorized as moderate.

Two ulcerative lesions were identified on the right buccal mucosa adjacent to the occlusal surface of tooth 47 and on the upper left inner lip commissure. The lesions were irregular in shape, multiple in number, less than 1 cm in size, and characterized by a yellowish-white base surrounded by erythematous margins. The lesions had well-defined borders, soft consistency, and were symptomatic. Based on the subjective and objective examinations, the diagnosis was established as multiple minor Recurrent Aphthous Stomatitis (RAS).

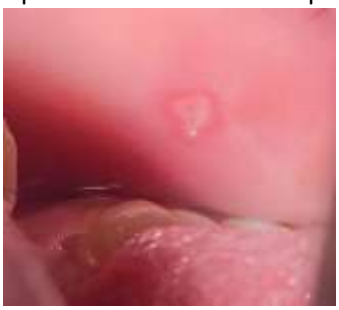

Figure 1. Ulcerative lesion observed on the inner buccal mucosa adjacent to tooth 47.

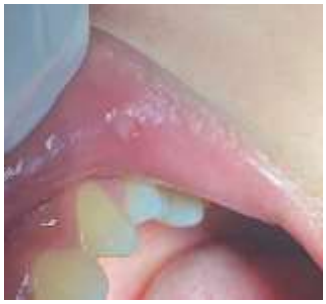

Figure 2. Ulcerative lesion observed at the upper left inner lip commissure.

MANAGEMENT

At the first visit, oral therapy was administered through the prescription of vitamin and mineral supplements. The patient was prescribed Caviplex, consisting of 10 tablets, with instructions to take one tablet once daily after meals. In addition to pharmacological therapy, the patient was provided with communication, information, and education (KIE) regarding Recurrent Aphthous Stomatitis (RAS), including the disease course, possible etiological factors despite the unclear exact cause, potential triggering factors, and appropriate management strategies. The patient was also advised to maintain good oral hygiene, consume fruits and vegetables regularly, and visit the dentist at least once every six months. At the follow-up visit one week later, intraoral examination revealed that both ulcerative lesions had begun to heal.

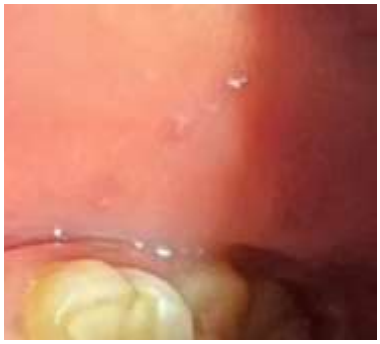

Figure 3. After 7 days, the ulcerative lesion on the inner buccal mucosa adjacent to tooth 47 showed signs of healing.

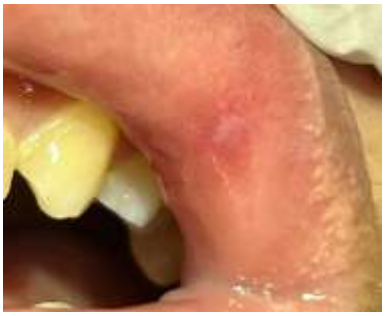

Figure 4. After 7 days, the ulcerative lesion at the upper left inner lip commissure showed signs of healing.

Discussion

Recurrent Aphthous Stomatitis (RAS) is an inflammatory condition of the oral mucosa characterized by small round or oval ulcers with a yellowish-white center surrounded by erythematous margins. These lesions are painful, may interfere with daily activities, and can negatively affect an individual's quality of life. RAS may occur in children, adolescents, and adults (Surachmin et al., 2024; Thantawi et al., 2019). Characteristically, the lesions appear on non-keratinized mucosa such as the soft palate, tongue, and floor of the mouth. Clinically, the lesions present as round or oval ulcers with well-defined borders, yellowish-gray bases, and erythematous margins (Aliyah Pradono, 2019; Retnowati et al., n.d.; Suci Araminta et al., n.d.).

Clinically, RAS is classified into three types: minor recurrent aphthous stomatitis, major recurrent aphthous stomatitis, and herpetiform recurrent aphthous stomatitis. Minor RAS is the most common form, occurring in more than 70% of patients with RAS. These lesions are typically round or oval, less than 10 mm in diameter, and usually appear as 1–5 superficial

ulcers on non-keratinized mucosa. The lesions are covered by a grayish-white pseudomembrane surrounded by an erythematous halo. Minor RAS generally heals within 10–14 days without scar formation despite recurrent episodes. Major RAS is reported in approximately 10–15% of RAS patients and presents with clinical features similar to minor RAS; however, the lesions are larger than 10 mm in diameter, deeper, and may occur in numbers ranging from 1–10 lesions. Major RAS often leaves scar tissue after healing and may require up to six weeks for recovery. Herpetiform RAS is observed in approximately 5–10% of RAS cases and clinically appears as clusters of multiple small recurrent ulcers. These lesions commonly affect movable mucosa, palatal mucosa, and gingiva. The ulcers are typically 1–2 mm in size but may number between 10–100 lesions, causing significant pain during activities such as eating and speaking, with a healing period of approximately 7–14 days (Surachmin et al., 2024).

The pathogenesis of RAS is associated with the immune system, particularly the Th1-type immune response. The initial stage is commonly characterized by burning sensation, pain, and discomfort that may interfere with daily activities within 24–48 hours prior to ulcer formation. Subsequently, lymphocyte infiltration into the oral epithelial cells triggers an inflammatory response, resulting in erythema, keratinocyte vacuolization, and local vasculitis, which produce swollen white papules. These papules later undergo ulceration, appearing as yellowish-white ulcers with erythematous borders within 48–72 hours. The lesions are infiltrated by neutrophils, lymphocytes, and plasma cells before progressing to healing and epithelial regeneration. The exact etiology of Recurrent Aphthous Stomatitis (RAS) remains unclear; however, several predisposing and triggering factors have been identified, including genetic factors, local trauma, hormonal disturbances such as menstruation, nutritional deficiencies, and psychological stress (Majid & Riolina, 2023; Surachmin et al., 2024; Widyastutik & Permadi, 2017).

In this case, based on the history taking, subjective examination, and objective findings, the patient reported recurrent episodes of canker sores occurring before menstruation, accompanied by stress related to academic demands and inadequate vegetable consumption. Clinical inspection revealed two ulcerative lesions located on the right inner buccal mucosa adjacent to the occlusal surface of tooth 47 and on the upper left inner lip commissure. The lesions were irregular in shape, multiple in number, less than 1 cm in size, with a yellowish-white base surrounded by erythematous margins, well-defined borders, soft consistency, and symptomatic. Based on these findings, the patient was diagnosed with Recurrent Aphthous Stomatitis (RAS), commonly known as recurrent canker sores.

The treatment plan for this case was delivered through an appropriate communication, information, and education approach. The patient was informed that the recurrent complaints experienced were referred to as recurrent canker sores or Recurrent Aphthous Stomatitis (RAS). These ulcerative lesions are non-malignant and not dangerous; however, they may recur within the oral cavity. Clinically, the lesions commonly appear as ulcers with a yellowish-white base surrounded by erythematous borders and may cause discomfort, particularly during eating and speaking, because they are symptomatic and associated with pain or soreness. Several factors may aggravate the condition, including poor oral hygiene, continuous smoking habits, certain systemic diseases, and spicy food consumption. In this patient, recurrent ulcers were considered to be associated with hormonal changes, stress, and nutritional deficiency.

The patient was informed that in some women, RAS frequently recurs before menstruation, particularly during the luteal phase, which occurs between days 15–28 of the menstrual cycle. This condition is associated with fluctuations in estrogen and progesterone levels, which become significantly reduced during this phase and affect immune balance as well as the resistance of the oral mucosa. As a result, the body's natural healing capacity decreases. Reduced progesterone levels are also associated with decreased polymorphonuclear leukocyte (PMN) counts, while decreased estrogen levels may inhibit oral epithelial cell maturation and increase vascular permeability. Increased vascular permeability causes the oral mucosa to become thinner and more susceptible to bacterial invasion, thereby triggering irritation within the oral cavity. The combination of hormonal changes, decreased local immune function, and increased mucosal vulnerability contributes to the development of RAS during the menstrual cycle (Arma et al., 2023; Darwis & Giantyana, 2024; Thantawi et al., 2019).

The patient was further educated that if recurrent ulcers continue to occur frequently during menstruation, the condition may be related to hormonal fluctuations involving estrogen and progesterone, which increase oral mucosal sensitivity and reduce immune resistance. If the symptoms persist or become more frequent, consultation with an obstetrician and gynecologist was recommended to evaluate possible underlying hormonal disturbances (Rambe et al., 2024). In addition, the patient was instructed to perform regular physical activity or exercise to improve immune function and to maintain oral hygiene by brushing the teeth with a soft-bristled toothbrush and using mouthwash regularly (Arma et al., 2023; Samsul et al., 2022; Suci Araminta et al., n.d.; Thantawi et al., 2019).

Besides hormonal factors, the patient also reported that academic targets and educational demands contributed to psychological stress. The patient was informed that stress plays an important role in triggering recurrence of Recurrent Aphthous Stomatitis (RAS) (Majid & Riolina, 2023; Wowor et al., 2019). Stress represents an interaction between environmental conditions and an individual's cognitive appraisal of challenges, difficulties, losses, and threats. Stress activates the Hypothalamic–Pituitary–Adrenal (HPA) axis, beginning with the release of corticotropin-releasing hormone (CRH) from the hypothalamus, which stimulates the pituitary gland to secrete adrenocorticotropic hormone (ACTH) (Endah et al., 2023). ACTH subsequently stimulates the adrenal glands to release stress hormones, including glucocorticoids (cortisol) and catecholamines such as adrenaline and noradrenaline. These hormones possess immunosuppressive and anti-inflammatory properties, particularly by suppressing cellular immune responses. Cortisol inhibits leukocyte accumulation at inflammatory sites and decreases the activity of cells producing secretory IgA, IgG, and neutrophils. Cortisol also affects protein metabolism by increasing protein catabolism, making cells more susceptible to rupture. These conditions increase susceptibility to inflammation and infection. Furthermore, elevated inflammatory mediators such as interleukin-1 (IL-1) and Matrix Metalloproteinases (MMPs) contribute to tissue damage and facilitate ulcer formation within the oral cavity (Darwis & Giantyana, 2024; Endah et al., 2023; Nugrahani et al., 2022).

Therefore, the patient was educated on the importance of stress management through emotional regulation, relaxation techniques, adequate sleep, light physical activity, and maintaining a balanced daily routine. The patient was also advised to manage time and prioritize academic tasks to prevent excessive workload accumulation, as well as to take regular breaks when experiencing mental fatigue. Social support from friends and family was encouraged because it has been shown to help reduce stress levels. If necessary, referral to a

psychologist or psychiatrist may be considered for counseling, cognitive behavioral therapy, or further stress management assistance (Dewi et al., 2017; Endah et al., 2023; Nugrahani et al., 2022).

In addition to the previously mentioned factors, it should be communicated to the patient that there are other contributing factors that may trigger the recurrence of RAS in this case, namely nutritional deficiencies such as vitamin B12, folic acid, and iron (Ziamona & Yuletnawati, 2025). Vitamin B12 plays an essential role in cell division, tissue growth, and red blood cell formation. Folic acid is required for DNA synthesis and epithelial cell regeneration, while iron is important for hemoglobin production, which transports oxygen throughout the body, including the oral mucosa.

In cases of iron deficiency, red blood cells may become macrocytic and appear oval or irregular, resembling immature cells. This condition reduces the oxygen-carrying capacity of red blood cells to the oral mucosa, leading to decreased tissue oxygenation and potentially causing oral mucosal atrophy. Deficiencies in vitamin B12, folic acid, and iron collectively impair epithelial regeneration in the oral mucosa and reduce immune system function (Afifah et al., 2022; Ronal & Aliyah, 2017). As a result, the mucosa becomes more fragile, more susceptible to damage, and more prone to inflammation. Furthermore, nutritional deficiencies may delay ulcer healing, leading to more frequent, larger, and longer-lasting aphthous ulcers (Ziamona & Yuletnawati, 2025).

Therefore, patient education was provided as part of the management approach to eliminate triggering and predisposing factors of recurrent aphthous stomatitis, emphasizing the importance of adopting a healthier lifestyle. The patient was advised to consume a balanced and nutrient-rich diet high in fiber, including vegetables, fruits, eggs, fish, and red meat, as well as to maintain regular eating patterns. The patient was also advised to avoid foods that may irritate the oral mucosa, such as spicy, acidic, overly hot, or hard-textured foods. If necessary, referral to a nutritionist may be considered to provide more appropriate dietary guidance, particularly if nutritional deficiencies are suspected to contribute to RAS recurrence (Amalina & Syifa, 2025).

In addition to education, oral therapy may be provided to help reduce symptoms and accelerate healing. This may include vitamin and mineral supplementation according to clinical indications, such as vitamin B complex, vitamin C, iron, or folic acid, to improve nutritional status essential for mucosal regeneration (Amalina & Syifa, 2025). Antiseptic mouthwash may be recommended to prevent secondary infection in the ulcerated area. To reduce pain, systemic analgesics or topical anesthetic gels may be prescribed to improve patient comfort during eating and speaking (Mišković et al., 2022; Suci Araminta et al., n.d.; Supriadi et al., 2022; Thantawi et al., 2019).

In this case, the patient was prescribed Caviplex as oral therapy. Caviplex is a multivitamin and mineral supplement that helps fulfill the body's nutritional needs, accelerates lesion healing, and supports hormonal balance. It contains folic acid, iron, zinc, calcium, magnesium, glutamic acid, as well as vitamins A, B1, B2, B12, C, D, and E. Caviplex was administered once daily after meals for 10 days. The patient was also instructed to control triggering factors by maintaining adequate nutrition and hydration, maintaining good oral hygiene, and managing emotional stress. Through the combination of oral therapy and lifestyle modification, it is expected that recurrent aphthous stomatitis (RAS), particularly those occurring before menstruation, can be reduced and the healing process can occur more rapidly (Khoiriyah et al., 2022; Mediawati et al., 2024; Mišković et al., 2022).

CONCLUSION

The Communication, Information, and Education (CIE) approach plays an important role in the successful management of Recurrent Aphthous Stomatitis (RAS), particularly in patients with hormonal, stress-related, and nutritional deficiency-related triggering factors. Appropriate education helps patients understand their condition, control risk factors, and supports both the healing process and the prevention of recurrence.

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