

Diagnosing an Acute Leukemia From a Necrotizing Ulcerative Gingivitis in The Oral Cavity: A Case Report

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ABSTRACT

Background: Necrotizing ulcerative gingivitis (NUG) is an acute onset of gingival disease, that presents as an acute, painful, and destructive ulceration and inflammation of gingival tissue. This condition is one of the oral manifestations of leukemia in addition to gingival enlargement and spontaneous bleeding, oral ulceration, petechiae, hematoma, and pale mucosa. **Case:** A 50-year-old woman presented with gum swelling, pain, and easy bleeding in the lower jaw gums. The patient often experiences fatigue, spontaneous bruising, dry skin, and hair loss. Extraoral examination revealed bruises on the hand. Intraoral examination revealed swelling, erythematous and ulcerative lesion, tartar, bleeding on probing in the lingual gingiva of lower central incisor teeth, mucosa pallor, and minor petechiae were observed at the buccal mucosa region 47-48. The provisional diagnosis was NUG with suspicion of systemic disorder.

Results: A complete blood count was performed which showed anemia, leukopenia, neutropenia, lymphocytosis, and thrombocytopenia. We diagnosed NUG in acute leukemia patients.

Conclusion: This case demonstrates the detection of leukemia and its oral manifestations in acute leukemia patient. The patient was referred to the hematologist oncology.

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INTRODUCTION

Necrotizing ulcerative gingivitis (NUG) which is also known as acute necrotizing ulcerative gingivitis (ANUG) is an acute periodontal disease characterized by rapid onset of interdental gingival necrosis, inflammation, redness, shine, irregular-shaped ulcers, gingival pain, bleeding, and halitosis.^{1,2} NUG is a polymicrobial infection with the main etiology being anaerobic opportunistic bacteria, especially the combination of activity of spirochetes bacteria, *Treponema spp.*, and *Fusobacterium spp.*, with host factors associated such as smoking habit, immunosuppression, psychological stress, and poor oral hygiene.^{2,3,4} NUG can occur at any age and is reported with the highest incidence between the ages of 20 and 30 years.⁵

Necrotizing ulcerative gingivitis, in some cases, can characterize acute leukemia. The formation of NUG occurs due to direct leukemic infiltration into the tissue or secondary to the patient's immunodeficiency, anemia, and thrombocytopenia. Therefore, NUG can be a diagnostic indicator of acute leukemia.⁶ Regarding leukemia, there are four subtypes of leukemia, including acute myeloid leukemia (AML), acute lymphocytic leukemia (ALL), chronic myeloid leukemia, and chronic lymphocytic leukemia.⁷ In acute leukemia, blast cells, immature blood cells from cancer cells, will divide rapidly so that leukemia grows quickly. It features marrow failure and cytopenia.^{8,9}

Gingival enlargement, mucosal pallor, oral ulceration, petechiae, spontaneous gingival bleeding, herpetic infection, and candidosis are among the common oral symptoms of acute leukemia.⁶ These oral symptoms might develop as a result of thrombocytopenia, neutropenia, or decreased granulocyte function as well as direct

infiltration of original leukemic cells. The patient's general symptoms include bleeding, weakness and fatigue, respiratory symptoms, and fever.¹⁰ Clinical findings help in the differential diagnosis of NUG from other diseases such as primary herpetic gingivostomatitis, desquamative gingivitis, and chronic destructive periodontal disease.⁵ The role of the dentist in identifying the oral manifestations of leukemia is very important where the diagnosis of leukemia is sometimes made after a dental examination.

This case illustrates NUG as a manifestation of acute leukemia in a female patient. The purpose of this report is to explain how to detect acute leukemia and how the clinical manifestations of the oral cavity in acute leukemia patients.

CASE

A 50-year-old woman presented with gum swelling, pain, and easy bleeding in the lower gums. The patient had several dental visits but did not get better and got a definite diagnosis. The patient also often experiences fatigue, spontaneous bruising, dry skin, and hair loss for about 6 months. Extraoral examination revealed bruises on the right and left hand (Fig.1). Vital signs were as follows: temperature of 37,8°C, heart rate of 98 beats per minute, blood pressure 160/100 mmHg, examination of the right and left submandibular glands showed palpable, tender, mobile, and painful swelling which indicates lymphadenitis. Intraoral examination revealed swelling, erythematous and ulcerative lesions, slightly tartar, bleeding on probing in the lingual gingiva of lower central incisor teeth from regions 32-43, ulcers with necrosis in regions 31-41 (Fig.2a), mucosal pallor, and minor petechiae were observed at the buccal mucosa region 47-48 (Fig.2b). The provisional diagnosis was NUG with suspicion of systemic disorders. The differential diagnosis was gingivitis,

desquamative gingivitis, primary herpetic gingivostomatitis, and periodontitis.

We referred the patient for a hematology test i.e. complete blood count. Mild calculus cleaning and chlorhexidine irrigation were performed to reduce the debris and tartar. We prescribe clindamycin, NSAID analgesics paracetamol, and chlorhexidine gluconate 2% mouthwash to reduce the infection and pain.

RESULTS

Three days later the patient came with the results of the blood test. Intraoral examination

showed no significant changes in the gums The hematology result (Table 1) revealed a low hemoglobin level, erythrocyte, and total hematocrit characteristic of anemia. A low leucocyte indicated leukopenia and a very low platelet count indicated the presence of thrombocytopenia. The neutrophil was low indicating neutropenia with high lymphocytes indicating lymphocytosis. All these hematological findings lead to confirming the patient was promptly referred to a hematologist oncologist for additional treatment after receiving the diagnosis of acute leukemia.

Table 1. Hematological Finding

CHECKING TYPE	Patient Result	Reference Range	Units
Hemoglobin	6,8	11,7-16,0	g/dL
Erythrocytes	1,98	3,80-5,30	10⁶ / μL
Hematocrit	20	35-47	%
MCV	100	81-101	fL
MCH	34	27-34	pg/cell
MCHC	34	31-36	g/dL
RDW	14,5	11,5-14,5	%
Leukocytes	1470	3600-10600	/ μL
Count Type			
Eosinophils	1	0-3	%
Basophils	1	0-2	%
Stem neutrophils	0	3 s/d 5	%
Segment neutrophils	17	50-70	%
Lymphocytes	76	18-42	%
monocytes	5	2 s/d 11	%
Platelets	3330	150000-450000	/ μL



Fig 1. Bruises in the right (a), and left (b) hand.

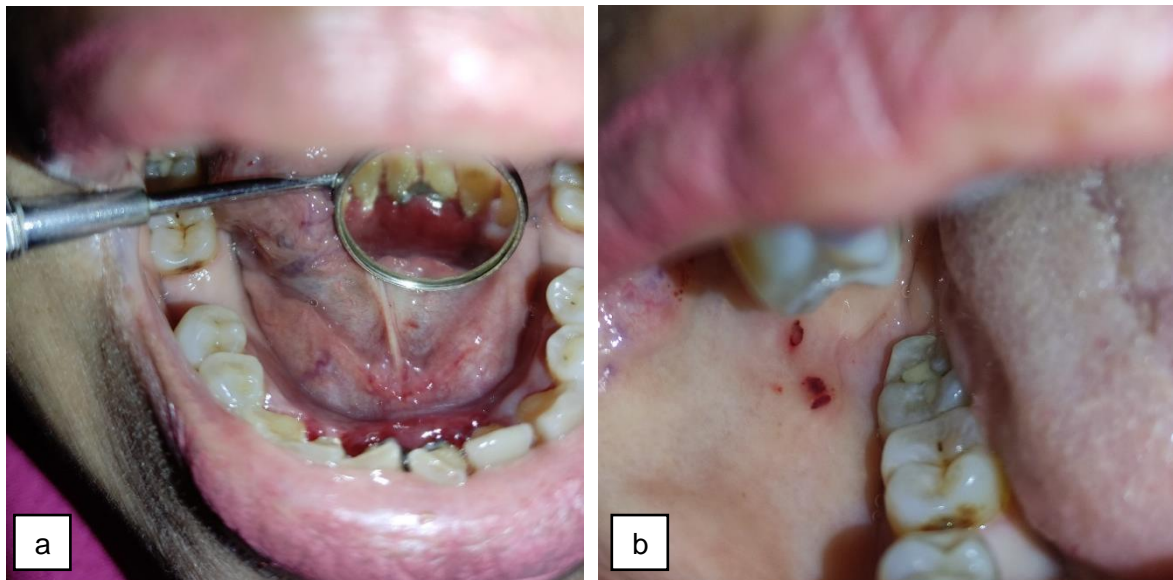


Fig 2. Necrotizing ulcerative with gingival swelling and reddish in 31 and 41 regions (a); Petechiae in the buccal mucosa 47-48 region (b)

DISCUSSION

This case describes a patient who complained of gingivitis for 6 months with systemic manifestations including fatigue and has had spontaneous bruising, dry skin, and hair loss. This indicates a systemic influence occurring in the patient. In leukemia patients, 11 individuals

(45.45%) experienced weakness, fatigue, lethargy, or tiredness.¹¹ Guan and Firth (2015) reported the same thing in patients with acute myeloid leukemia, where these patients emerge very tired, weak, and pale.¹² Masoumi-Dehshiri et.al (2014) in their case report, reported that patients with acute myeloid

leukemia experienced weakness and fatigue.¹³ This symptom is caused by reduced production of normal erythroblasts, causing a symptom of weakness, constant fatigue, and pallor. Decreased platelet levels explain the occurrence of bruising.¹⁴

Vital signs examination, in this case, showed that the patient was sub febrile, with a normal heart rate but the patient had hypertension. Examination of the glands also reveals lymphadenitis. Masoumi-Dehshiri et.al (2014)¹³ in their case report, reported the presence of recurrent fever and night sweats in patients suffering from acute myeloid leukemia. Lim and Kim (2014) reported the presence of lymphadenitis and hypertension in patients suffering from acute myeloid leukemia¹⁴, but hypertension was not associated with leukemia. In contrast to Guan and Firth (2015), showed no regional lymphadenopathy or swelling of the salivary glands was found.¹⁵ In leukemia patients, fever is the presenting symptom in 10% of patients regardless of infection, and spontaneous bleeding and a tendency to bruise easily are present in 5% of patients. The condition of lymphadenitis may be associated with an infection in the oral cavity. Reduced granulocyte production can cause fever and infection.¹⁴

Intraoral clinical examination, in this case, showed swelling, erythematous and ulcerative lesion, slight tartar, bleeding on probing in the lingual gingiva of lower central incisor teeth from regions 32-43, and ulcers with necrosis in regions 31-41. The clinical picture shows a picture of NUG. NUG is distinguished by an abnormal accumulation of dental plaque, characterized by rapid onset of interdental gingival necrosis, and redness, with papillary areas typically covered by a soft, whitish, or grey coating with an ulcerated gingival edge and an erythematous halo, bleeding and halitosis. Systemic symptoms such as lymphadenopathy and

malaise may also be present.¹⁴ In this case, mucosal pallor and minor petechiae were observed in the buccal mucosa region 47-48. The presence of NUG with pale mucosa and petechiae is one of the signs of acute leukemia in the oral cavity. Local signs and observations of leukemia in the oral cavity include pallor of the oral mucosa with gingival bleeding progressing to painless gingival hyperplasia, petechiae, bleeding, and ulcerative necrotic lesions.¹⁵ The decrease in erythrocytes causes the mucosa to become pale and the decrease in platelet levels can cause spontaneous bleeding and petechiae.¹⁴

Mild calculus cleaning and chlorhexidine 0.2% irrigation was performed to reduce the debris and tartar, and the patient felt better after three days of treatment and prescription. Management of patients with blood disorders should be carried out with caution and with minimum intervention. Things to consider in treating patients with white blood disorders are bleeding tendencies, increased risk of infection, and malignancy.¹⁵ Irrigation of chlorhexidine gluconate 0.2% aims to kill bacteria. The main cause of NUG is opportunistic fusospirochetal infection caused by symbiotic oral flora, especially predisposed to a weakened immune system.¹⁶ A study showed that 78% of all microorganisms cultured in necrotic lesions of NUG patients were Gram anaerobic (-) bacteria.¹⁷ Spirochetes and most gram-negative bacteria, including *Bacteroides intermedius*, and fusiform sp. as the most common cause of NUG.¹⁸ Chlorhexidine has a broad spectrum of activity and works by inhibiting gram-positive and gram-negative bacteria, dermatophytes, yeasts, as well as several lipophilic viruses.¹⁹

Systemic therapies that were provided to the patients include antibiotic clindamycin 300 mg three times a day, NSAID analgesics paracetamol

500 mg three times a day, and chlorhexidine gluconate 2% mouthwash to reduce the infection and pain. Clindamycin is one of the recommended antibiotics to treat periodontal disease. Tetracycline, penicillin, metronidazole, a combination of penicillin and metronidazole, and clindamycin are the recommended antibiotics for periodontal disease.²⁰ Paracetamol reduces sub-febrile symptoms and also reduces pain. NSAIDs that are often used in dentistry include; ibuprofen, mefenamic acid, ketoprofen, ketorolac, flurbiprofen, and paracetamol. Paracetamol is used mostly for its analgesic effect and does not damage platelets or the digestive system.²¹ Administration of 0.2% chlorhexidine gluconate mouthwash is the gold standard mouthwash for plaque and gingivitis control.¹⁹ Chlorhexidine is a mouthwash that is effective against oral microbes since it can reduce plaque germs by 80% and prevent plaque because it possesses bactericidal and bacteriostatic characteristics against oral bacteria.²²

Blood tests were carried out to help investigate for diagnosis and found anemia, leukopenia, neutropenia, lymphocytosis, and thrombocytopenia which may suggest acute leukemia. In leukemia patients, there is an excess of hematopoietic malignant tumor cells in the bone marrow and peripheral blood, leading to a decrease in the quantity of circulating normal blood cells, characterized by symptoms associated with anemia, neutropenia, and thrombocytopenia.^{15,23} Decreased hemoglobin, hematocrit, and erythrocytes are indicative of the presence of anemia which is suspected to be Fe deficiency anemia.²⁴ Based on demographic data from acute lymphoblastic leukemia patients in 2016-2020 at Sanglah Hospital Bali, an examination of blood vessels found moderate anemia in adult women, leukocytosis, neutropenia, lymphocytosis, and

thrombocytopenia.²⁵ All these hematological findings lead to confirming the diagnosis of acute leukemia.

The history, extraoral clinical examination, intraoral examination, and blood tests are very important in establishing the diagnosis of acute leukemia. A blood morphology examination needs to be done to confirm the diagnosis of acute leukemia. Cancer treatment is carried out as soon as possible to improve the patient's recovery prognosis. Therefore, we made a referral as soon as possible to the hematologist oncology to get further therapy. Cancer therapy is very important to support the healing of patient complaints in the oral cavity. Our limitations in diagnosing this case were the absence of a blood morphology examination and being unable to follow up on the patient's condition because of the patient's wishes.

CONCLUSION

The patient felt more comfortable 3 days after therapy and prescription. History, clinical examination, and further investigations are crucial in diagnosing NUG in acute leukemia patients. Further diagnosis of the type of cancer and cancer treatment is needed to improve the patient's recovery and prognosis. The patient was referred to the hematologist for cancer therapy.

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