

Generalized Diffuse Gingival Enlargement- The First and Only Presenting Feature in Leukemia Patients: A Case Report

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ABSTRACT

Gingival enlargement, also known as gingival overgrowth, refers to the abnormal and excessive proliferation of gingival tissue. This condition can stem from a variety of causes, and differential diagnosis should consider factors such as poor oral hygiene leading to inflammatory gingival hyperplasia, drug-induced enlargement, systemic diseases, genetic disorders, hyperplastic gingivitis, neoplastic, and non-specific conditions. Leukemia, a malignancy affecting white blood cells, poses significant health risks if not diagnosed and treated promptly. Oral manifestations can sometimes serve as the earliest and in some cases the only indicators of leukemia. Therefore, early recognition by dentists is crucial for timely diagnosis and treatment. This case report highlights the vital role of dentists in early diagnosis, underscoring the fact that oral abnormalities can be the first and only indicators of leukemia.

KEY WORDS: Gingival overgrowth, gingival hypertrophy, hyperplasia, leukemia, myeloid, neoplasms, case reports.

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INTRODUCTION

Gingival enlargement, also known as gingival overgrowth, describes an abnormal and excessive increase in gingival tissue that may arise from various contributing factors. The differential diagnosis includes causes such as poor oral hygiene (leading to inflammatory gingival hyperplasia), drug-induced overgrowth, systemic diseases, genetic disorders, hyperplastic gingivitis, neoplastic conditions, and gingival fibromatosis. [1] Gingival overgrowth may also appear as a localized metastatic lesion or may be associated with hematological disorders like Granulomatous diseases (e.g., Wegener's granulomatosis, sarcoidosis) or leukemic infiltration. The affected tissue may exhibit an inflammatory, fibrotic, or mixed histological background.

Acute Myeloid Leukemia (AML) is defined by the clonal neoplastic proliferation of immature myeloid precursor cells in the bone marrow, accompanied by a failure in their maturation. As leukemic blasts replace normal marrow tissue, clinical signs such as anemia, thrombocytopenia, and granulocytopenia with or without leukocytosis emerge. This accumulation of dysfunctional blast cells disrupts normal blood cell production (hematopoiesis) and, without timely

treatment, leads to bone marrow failure and potentially fatal outcomes.

While leukemia in general is a common disease, the specific type of AML is uncommon, making up about 1% of all cancers. It is the second most common type of leukemia found in both adults and children, but most of the cases happen in adults. AML makes up 31% of all adult leukemia cases. [2] Its annual incidence is 2-3 per 100,000. Incidence increases with age (ICMR-2019 report). [3] Although AML can be diagnosed at any age, it is uncommon in people under 45. The typical age for diagnosis is around 68. Oral symptoms are seen in 15% to 80% of leukemia cases, and they are more often found in acute leukemia (65%) compared to chronic leukemia (30%). [4] These oral symptoms can include swollen gums, bleeding, or ulcerations in the mouth. Swollen gums, known as gingival hyperplasia, are most frequently linked to acute monocytic leukemia (AML-M5) in about 66.7% of cases and acute myelomonocytic leukemia (AML-M4) in around 18.5% of cases. [5]

The oral cavity often serves as an early indicator for a wide range of systemic diseases. A comprehensive evaluation of the oral mucosa, gingiva, teeth, tongue, and other soft tissues

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can aid in the early and accurate diagnosis of underlying systemic conditions. Disorders such as blood dyscrasias, endocrine imbalance, and nutritional deficiencies can manifest through gingival alterations, often influenced by local factors in the oral cavity. Leukemia, a cancer of white blood cells, can lead to serious morbidity and mortality if not identified and managed promptly. In some cases, oral manifestations may be the first and only clinical signs of leukemia, underscoring the importance of timely and accurate diagnosis by dental professionals. This case report presents a diagnosis of AML primarily based on oral manifestations, highlighting the critical diagnostic role of dentists.

CASE REPORT

A patient named Surender, a 29-year-old male, farmer, came in the Outpatient Department of Periodontology on 23 February 2024 with the chief complaint of diffuse gingival enlargement with rapid development in the past one and a half months, along with difficulty in eating and chewing food items, and associated bad breath. The patient had consulted online and sent his photographs. After reviewing his clinical photographs, he was advised to undergo a complete blood

count, ESR, and tests to rule out tuberculosis or any other systemic diseases.

After evaluation of his reports (**Table 1**), the patient was advised to visit the department of periodontology. After his visit, a detailed history of his ailment was taken. There was no history of any systemic illness in the past few days and no history of any drug intake or any other medications related to hypertension, epilepsy, or immunosuppressants. There was no history of smoking or any other habits noted. He told us that he had been seeking treatment from a private dental hospital in the locality for the past one and a half months for the same. Oral prophylaxis was done 3-4 times, along with chlorhexidine mouthwash, which has been recommended there, and the patient has been using it since then. There were no signs of improvement according to the patient, and the condition was getting worse day by day. On clinical examination, there was diffuse gingival enlargement in both the jaws covering nearly the entire tooth surfaces. Gingival hyperplasia involved the buccal, lingual, and palatal aspects as well. The gingiva was bulbous, soft, erythematous, and lacked stippling with generalized ulceration at the margins (**Figure 1**). Profuse bleeding was present on gentle manipulation with a severe foul odor.

	10 days before examination	On 26-2-2024	Normal values
TLC	2.88	61.58	4-11 x 10 ³ mm ³
Lymphocytes	71.10	13.00	20-40 %
Neutrophils	10.40	02.00	40-70 %
Monocytes	-----	83	2-10 %
Platelets	144	48	150-400 x 10 ³ mm ³
RBC	----	3.09	4.2-5.4 x 10 ⁶ mm ³
Hb	10.9	9.3	12-15 g/dl
MCV	97.6	100.60	82-95 fl
Blast cells	-----	66 %	00
ESR	-----	120.00	0-10 mm/hr
Temperature	-----	100.7	98 °F

Table 1. Hematological findings of the patient 10 days back and after 3 days of referral.



Figure 1. Patient's intraoral view exhibited diffuse maxillary and mandibular gingival enlargement.

INVESTIGATIONS

Based on the above findings, clinical presentation, and severity of gingival enlargement in a short period, a provisional diagnosis of blood dyscrasias, granulomatous disease (ex-, Wegener's granulomatosis, Sarcoidosis), and tuberculosis was made. The patient was sent to the Department of Medicine that same day with an urgent call for additional evaluation. There, he was advised to undergo several additional tests, such as a complete blood count, peripheral blood smear, biochemical tests (ESR, lipid profile, vitamin B12, vitamin D assay, LFT, RFT, urine screening, chest X-ray, and abdominal USG, which revealed splenomegaly. The complete blood count revealed a low platelet count, low haemoglobin levels, and a decline in red blood cells (**Table 1**).

After two days, he suffered from systemic manifestations such as fatigue, nausea, vomiting, fever, weight loss, and loss of sleep, and was admitted to the hospital, where systemic antibiotics were administered, and advised to undergo complete blood count and peripheral blood smear repeatedly. On seeing the reports, the blood smear revealed marked leukocytosis with the presence of atypical monocytoid cells with 66% blast cells, suggesting blood dyscrasias, probably leukemia. To confirm this, bone marrow aspirates were taken from the patient after two days of hospitalization.

DIAGNOSIS AND TREATMENT

Based on bone marrow biopsy and peripheral blood smear, a diagnosis of AML was established, and the patient was referred to a higher center on 29-2-2024 for further treatment. He was only advised to use chlorhexidine mouthwash 2-3 times a day during the treatment. The patient underwent blood transfusions followed by chemotherapy. The patient was also concomitantly injected with antiemetics, analgesics, prophylactic antibiotics, and antifungals. After two months of chemotherapy, the patient was referred to a cancer hospital, where he continues to be on follow-up.

DISCUSSION

Acute monocytic leukemia (AML-M5) exhibits the highest incidence of gingival infiltration, observed in 66.7% of cases, followed by acute myelomonocytic leukemia (AML-M4) at 18.5%, and acute myeloblastic leukemia (AML-M1, M2) at 3.7%.^[6] Among these, gingival enlargement is one of the most consistent oral features in monocytic leukemia, reported in

approximately 80% of cases. Frequently observed symptoms in leukemia include gingival swelling, mouth ulcers, spontaneous bleeding of the gums, petechiae, pale mucosal surfaces, and recurrent infections.^[7,8] Other less common oral symptoms can include blisters on the tongue, chapped lips, edema of parotid glands, hyperpigmentation of the palate, tooth pain, and mobility.^[9] The severity of gingival manifestations is often influenced by the underlying inflammatory condition of the tissues.^[10] Furthermore, poor oral hygiene significantly increases the risk of oral pain, bleeding, secondary infections, and even tissue necrosis.^[11] According to Tallman et al., the 3-year overall survival rate for patients with AML-M5 was reported at 31%.^[12] When treating leukemia patients, periodontal procedures must be performed with the physician's approval. Interventions such as scaling and root planing should be accompanied by prophylactic antibiotics, and patients should be advised to use 0.2% chlorhexidine mouthwash following oral hygiene routines.

Numerous researchers have highlighted the idea that oral health reflects general health, a concept that relies on thorough clinical assessment and investigative rigor. This case report highlights how important it is for oral health care professionals to identify the signs and symptoms of systemic diseases that appear in the oral cavity. Therefore, dentists are in charge of making the initial diagnosis in leukemic patients because acute leukaemia frequently forces the patient to seek dental care initially. The dentist must completely examine the pathology by asking additional tests or referring the patient to a higher centre to facilitate early diagnosis and subsequent early care.

CONCLUSION

The oral cavity can reflect manifestations of numerous systemic diseases, highlighting the need for a comprehensive evaluation of the oral mucosa, gingiva, teeth, tongue, and other related tissues. At times, oral symptoms may serve as indicators of underlying systemic conditions such as endocrine disorders, nutritional deficiencies, or hematologic conditions. Leukemia, a malignancy of white blood cells, can lead to severe health complications. In some cases, oral manifestations may represent the initial or sole clinical signs of leukemia, underscoring the importance of early and accurate diagnosis by dental professionals.

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DECLARATION OF PATIENT CONSENT

We have obtained all the appropriate informed patient consent for his images and other clinical information.

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AUTHOR CONTRIBUTIONS

Mahenigar –collected the data, design, wrote and edited the manuscript

Ajay Mahajan-data analysis, wrote and edited the manuscript

Kanwarjit Singh Asi- data analysis and corrected the manuscript

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