

# Leukemic gingival enlargement: Report of a rare case with review of literature

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## ABSTRACT

Oral cavity functions as an early indicator for a variety of systemic diseases. Early and accurate diagnosis of these underlying systemic disorders entails thorough examination of the oral mucosa, gingiva, teeth, tongue and other oral tissues. Although gingival changes may be related to local factors in the oral cavity, it can also be an expression of systemic conditions such as blood dyscrasias, endocrinal imbalance, and nutritional deficiencies. Leukemia, a malignancy of white blood cells is a dreadful disease, which, if not diagnosed properly and treated early may result in significant morbidity and mortality. Oral changes may be the first and only presenting signs in leukemic patients. This paper aims to throw light on an interesting case of acute leukemia diagnosed on the basis of oral signs and emphasizes the importance of thorough oral examination to identify the threatening condition.

**Key words:** Gingival enlargement, leukemia, oral manifestations

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## INTRODUCTION

“Gingival overgrowth” or “gingival enlargement” is an increase in size of the gingiva and accounts to one of the many types of periodontal diseases. Based on etiologic factors and pathologic changes, gingival enlargement may be classified as - (1) inflammatory enlargement: Acute and chronic; (2) drug induced enlargement: Anticonvulsants - phenytoin, calcium channel blockers - verapamil, nifedipine, immunosuppressants - cyclosporine; (3) Overgrowth associated with systemic diseases: Conditioned overgrowth – due to pregnancy, puberty, Vitamin C deficiency, plasma cell gingivitis, nonspecific conditioned overgrowth (granuloma pyogenicum), and systemic diseases causing gingival overgrowth – due to

leukemia, granulomatous diseases (sarcoidosis, Crohn’s disease, Wegeners granulomatosis); (4) neoplastic overgrowth (gingival tumors): Benign tumors, malignant tumors; (5) false enlargements.<sup>[1]</sup>

The clinical manifestation of gingival enlargement differs based on its etiology. Genetically induced gingival enlargement appears pink in color with minimal signs of inflammation, has a slow growth rate, and is firm in consistency. Soft, edematous, tender gingiva with ease to bleeding is a sign in blood disorders.<sup>[2]</sup> Gingival enlargement in leukemia occurs due to infiltration of premature leukocytes. This is a common symptom that aids in the diagnosis of leukemia and warrants dental consultation.<sup>[1]</sup> Many of the life-threatening diseases may present with oral lesions as the initial manifestation, thus, necessitating the familiarization of dental professionals with the manifestations of systemic diseases.<sup>[2,3]</sup>

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## CASE REPORT

An 18-year-old female patient from low socioeconomic status reported to the outpatient Department of Oral Medicine and Radiology, with a complaint of swollen and bleeding gums for the past 1-month. Gingival swelling progressed slowly within the last 20 days and was associated with bleeding and tenderness. Medical history revealed that the patient experienced lethargy, slight weight loss

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and loss of appetite in the last few months. However, she denied the intake of any medications for chronic illness. Physical examination revealed that the patient was poorly built and nourished with petechial spots on the skin in the forearm and legs. Bilateral submandibular and deep cervical lymphadenopathy was appreciated. Lymph nodes were indurated and tender on palpation. Intraoral examination revealed generalized gingival enlargement on the buccal, labial, palatal and lingual aspect of marginal and attached gingiva of the maxillary and mandibular arches [Figure 1a-c]. Gingiva was swollen, glazed, shiny, bluish red in color with areas of a mild ecchymosis in the floor of the mouth. Gingival enlargement extended on to one-third to one-half of the crown portion of teeth. The patient had a foul odor and fair oral hygiene. On palpation, gingiva was soft, edematous, devoid of stippling and tender on palpation. Gingival bleeding on slight provocation was also appreciated. Orthopantomogram did not revealed bony involvement. Inflammatory gingival enlargement, drug induced enlargement, conditioned gingival enlargement, and systemic gingival enlargement were considered in the differential diagnosis. Inflammatory enlargement was ruled out as the inflammatory component (plaque and calculus) was not significant to the severity of the presented gingival enlargement. Drug-induced enlargement was ruled out as thorough history taking did not reveal the intake of any drug significant for gingival enlargement. However, features of lethargy, weight loss and loss of appetite along with the rapidly progressive gingival overgrowth and presence of ecchymosis in the floor of the mouth substantiated an underlying systemic disease.

Complete blood count was performed, and it revealed features of leukocytosis, anemia and thrombocytopenia [Table 1]. Peripheral blood smear reveals numerous

monoblasts (60%) and promonocytes. Monoblasts are having moderate to severe basophilic cytoplasm with large, round nuclei and lacy chromatin. Scarcity of platelets can be appreciated with a nucleated red blood cell (RBC) in the background [Figure 2]. Based on the blood parameters and peripheral blood smear, a final diagnosis of gingival enlargement due to acute myeloid leukemia (AML) was made. The patient was advised to maintain proper oral hygiene by use of soft bristle toothbrush and 0.2% oral chlorhexidine rinses. The patient was referred to oncology center for bone marrow aspiration and chemotherapy. However, the patient could not respond to the treatment and died 4 days later due to multi organ failure.

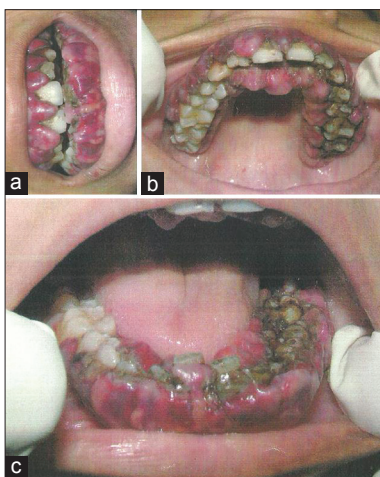
## DISCUSSION

Leukemia is a malignancy of white blood cells (WBCs) and occurs either due to uncoordinated proliferation or increased viability of white cells (now called blasts). Based on the cell lineage and evolution of the disease, leukemia's are broadly classified as lymphoid or myeloid, and acute or chronic respectively.<sup>[4]</sup> Chronic leukemia's shows slow onset, runs an indolent course of months

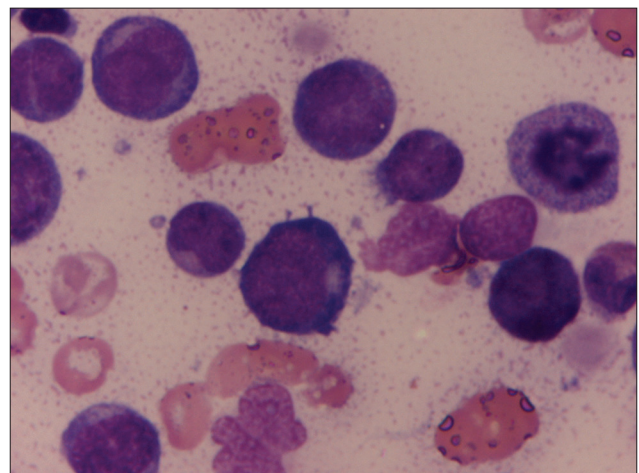
**Table 1: Complete blood count of the case**

Blood parameters	Present value	Normal value
Hb %	7.4 g	11-13 g
RBC's	1.23 million/cu mm	3.5-5.5 million/cu mm
Platelets	60,000/cu mm	1,50,000-4,50,000/cu mm
WBC's	81,200/cu mm	4,000-11,000/cu mm
Neutrophils %	5	40-70
Lymphocytes %	2	20-40
Eosonophils %	6	1-8
Basophils %	2	1-4
Monoblasts %	60	0
ESR	80 mm/h	2-12 mm/h

Hb: Hemogram; RBC's: Red blood cells; WBC's: White blood cells; ESR: Erythrocyte sedimentation rate



**Figure 1:** (a) Generalized gingival enlargement involving maxillary and mandibular arch. (b) Boggy, reddish-blue gingiva on the buccal, labial, palatal and lingual aspect of marginal and attached maxillary gingiva. (c) Enlarged gingiva covering the crown surface with a mild ecchymosis in the floor of the mouth



**Figure 2:** Peripheral blood smear showing numerous monoblasts and promonocytes and scarcity of platelets

to years and involve relatively well-differentiated leukocytes. In acute leukemia's, there is disorganized proliferation of poorly differentiated blast cells. They are abrupt in onset, and untreated cases shows aggressive and rapidly fatal nature.<sup>[5]</sup> Chronic and acute leukemia's are classified according to the type of WBC involved, that is, lymphoid and myeloid. French - American - British classification further subdivides acute lymphoid leukemia and AML, based on the degree of differentiation along cell lines and the extent of cell maturation.<sup>[5]</sup>

Although various predisposing factors have been attributed, yet the exact etiology of leukemia remains obscure. Predisposing factors include: Exposure to ionizing radiation or electromagnetic fields, cytotoxic therapy, and viral infections.<sup>[6]</sup>

According to Stafford *et al.*, oral lesions are more frequently seen in patients with acute leukemia.<sup>[7]</sup> Oral manifestations may either be the result of direct infiltration of leukemic cells (primary) or secondary to underlying thrombocytopenia, neutropenia, or impaired granulocyte function.<sup>[6]</sup> Gingival infiltration represents a 5% frequency as the initial presenting complication of AML.<sup>[8]</sup> Dreizen *et al.* suggested that patients with acute monocytic leukemia had the greatest incidence of gingival infiltrates (M5) (66.7%) followed by acute myelomonocytic leukemia (M4) (18.5%) and acute myeloblastic leukemia (M1, M2) (3.7%).<sup>[9]</sup>

Common oral manifestations of acute leukemia's include swollen gingiva, oral ulcers, spontaneous gingival bleeding, petechiae, pale mucosa, viral and fungal infections (herpes and candidosis).<sup>[7,10]</sup> Cracked lips, hemorrhagic bullae on the anterior dorsum of the tongue, buccal and labial mucosa, tooth pain and mobility, and petechiae accounts for the uncommon oral signs.<sup>[11]</sup> Gingival overgrowth may vary in severity, from minimal to complete tooth coverage and hinders with the function and aesthetics.<sup>[12]</sup> Leukemic gingival infiltration is not seen in edentulous individuals, thus, suggesting a potential role of tooth-associated local factors in its pathogenesis.<sup>[9]</sup> Caries, calculus, and poor oral hygiene may exacerbate gingival signs and symptoms and predisposes the patient for oral pain, bleeding, super infection, and tissue necrosis.<sup>[12]</sup>

The diagnosis is suggested by a complete blood cell count showing pancytopenia and blast cells and is confirmed by examination of the bone marrow. Investigation of the specific type of leukemia simplifies the best treatment and most accurate prognosis.

Treatment options in acute leukemia's include aggressive multidrug chemotherapy and allogenic bone marrow transplantation. Periodontal and dental treatment for leukemic patients should always be planned after medical evaluation and physicians consent. Periodontal intervention (scaling and root planning) should be done under prophylactic antibiotics. Patients are advised 0.12% chlorhexidine mouth rinses postoperative oral hygiene procedures. However, periodontal surgeries are postponed until complete remission of the underlying disease occurs.<sup>[1]</sup>

Our patient was advised to maintain meticulous oral hygiene by use of soft bristle tooth brush and 0.2% chlorhexidine mouth rinses. However, periodontal intervention was not performed, and the patient was referred to oncology center for chemotherapy. The patient succumbed to death within 4 days after hospital admission.

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