

Acute lymphoblastic leukemia and gingival enlargement – a case report

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Abstract

Gingival enlargement is caused by various factors such as inflammation, medications and malignant diseases. Acute leukemic enlargement is commonly seen in children. If prompt diagnosis is not made properly and treated early, it may result in significant morbidity and mortality. Gingival enlargement is seldom seen in adult patients with acute lymphoblastic leukemia. This case report presents an interesting rare case of gingival enlargement in an adult patient with acute lymphoblastic leukemia and management of the disease.

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Introduction

Virchow in 1874 defined leukemia as a malignancy affecting the white blood cells (WBCs) of the bone marrow which results in a drastic increase in immature or abnormal white blood cells in the circulation. Leukemia occurs due to abnormal proliferation of hematopoietic stem cells with impaired differentiation and apoptosis.

The causative factors of leukemia are unknown but the risk factors well established and include ionizing radiation and non-ionizing electromagnetic fields, viral infection, smoking and chemicals such as benzene [1, 2].

According to the clinical course, leukemia is classified into acute and chronic types and according to its development histogenetically, as lymphocytic and myelocytic [2].

The four principal categories are:

- acute myelocytic leukemia (AML),
- acute lymphocytic leukemia (ALL),
- chronic myelocytic leukemia (CML),
- chronic lymphocytic leukemia (CLL).

In acute lymphoblastic leukemia, three types are seen based on their origin from precursor cells:

- B cell type – 65% (most common),
- T cell type – 20%,
- null cell type – 15%.

Myelosuppression or leukemic cell infiltration into other tissues results in classical signs and symptoms of acute leukemia. These include anemia, thrombocytopenia, and a decrease in neutrophil activity. Pallor, breathlessness, and fatigue are other presenting symptoms.

The majority of patients (65%) with leukemia present with oral manifestations. These include bleeding gums, epistaxis, ecchymosis, or a combination of these may occur [3].

Gingival enlargement is caused by various factors including inflammatory conditions such as poor oral hygiene. Systemic conditions such as hormonal disturbances, drugs, and malignant tumors also cause gingival overgrowth. Gingival hyperplasia is also seen in granulomatous diseases including von Recklinghausen's disease, Wegener's granulomatosis, sarcoidosis, and patients with leukemia.

In the majority of leukemic patients gingival hyperplasia as an oral manifestation is reported in the literature. It involves progressive enlargement of the interdental papillary

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regions extending into marginal and attached gingiva. In the severe form, the crowns of the teeth are also covered. Gingiva appears pale reddish purple in color, and edematous, with loss of stippling and bleeding on probing.

Gingival overgrowth occurs in both acute and chronic leukemia, but unpredictably. Upon effective chemotherapy gingival enlargement subsides completely or at least partly [4].

Here we discuss a case report of a patient diagnosed with acute lymphocytic leukemia with rapid development of gingival hyperplasia and the dental management of the same.

Case description

A 22-year-old male patient was referred to the Department of Periodontology, Manipal College of Dental Sciences, Mangalore, from the Department of Medical Oncology with the chief complaint of increased size of gums in a span of 5-6 weeks which was also associated with bleeding gums and mild pain. The patient was known to have had acute promyelocytic leukemia (M3) with grade 4 febrile neutropenia since 2 years and was under chemotherapy and presently was under maintenance phase and medications (Dexona Inj, Rantac Inj, inj vincristine, duanomycin, methotrexate, Bac-trim DS tab, Xyzole and MTX tab).

On clinical examination, grade III gingival enlargement (Bokenkamp et al.) was seen, which was confined to mandibular anteriors, and grade II in relation to maxillary anteriors. The gingiva was bright red in color, inflamed, and stippling was absent (Figures 1-3). There was presence of bleeding on probing with an oral hygiene score of 1.3 (fair).

The patient complained of fatigue, weakness, and weight loss. Complete blood count showed low hemoglobin levels (10.1 g/dl) suggestive of anemia, a decreased platelet count (38,000 cells/mm) suggestive of thrombocytopenia, the total white blood cell count was 14,00 cells/mm, and a differential count showed a decrease in neutrophil levels suggestive of neutropenia.

The patient was advised to undergo non-surgical and non-invasive periodontal therapy with regular follow up visits. The physician's consent and the patient's consent were obtained before the therapy.

The phase I therapy inclusive of supragingival scaling and saline irrigation was performed. The patient was recalled every 2 weeks and non-surgical therapy was applied until 3 months.

Discussion

Leukemia is the most common cancer in children and accounts for 25-40% of the Indian population. 60-85% of cases reported are of acute lymphoblastic cell type. Oral manifestations associated with leukemia has been well documented. Very few cases of acute lymphoblastic leukemia associated with gingival enlargement are reported in the literature.

Oral manifestations are very common in patients with acute leukemia [5].

Stafford *et al.* examined 500 leukemic patients and found that 65% presented with oral signs and symptoms that caused them to seek dental treatment. In fact, oral manifestations are often the first indication of the disease.⁵ However, Forkner (1934) concluded that gingival hyperplasia is typical of acute monocytic leukemia while it is usually absent in myelogenous or lymphatic varieties. This necessitates



Figure 1. Intra-oral photograph frontal view – showing gingival enlargement confined to maxillary and mandibular anteriors



Figure 2. Follow-up: 2 months – inflammation and hyperplasia reduced



Figure 3. Follow-up: 6 months – regression of lesion is seen after chemotherapy and minimally invasive periodontal therapy

the dentist's familiarization with manifesting signs and complications of leukemia for diagnosis and management of the disease [6].

ALL associated with gingival enlargement is usually seen in childhood. In the present case the patient was 22 years old and reported with gingival enlargement, which could be considered as rare or uncommon. Driezen et al. observed in patients on antileukemia chemotherapy that 3-5% of AML patients presented with gingival hyperplasia [7, 13]. Patil *et al.* presented a case report of a 28-year-old female patient with acute lymphoblastic leukemia associated with gingival enlargement and management of the lesion [11, 12, 13].

In leukemia the gingival enlargement is soft and edematous and usually associated with bleeding. The cells of the gingiva have increased susceptibility to leukemic cell infiltration due to the anatomical structure and endothelial adhesion molecules [9]. In the present case, the patient presented the symptoms in accordance with the features of leukemic gingival enlargement [8, 9].

In the present case only asymptomatic minimally invasive treatment was applied. Surgical procedures were not carried out. Previous studies have shown acute exacerbation and complications following invasive procedures [8, 10]. The patient was advised to use a soft toothbrush and warm saline rinses. The patient was undergoing chemotherapy. The patient's follow-up was conducted up to 6 months and spontaneous remission of the lesion was seen.

Conclusions

Gingival enlargement in ALL is seen in very few cases. Early diagnosis and treatment can prevent remission. Thus, the dental and medical professionals can play an important role in diagnosing unusual oral conditions and must have thorough knowledge of the diagnostic signs and complications associated with leukemia for prompt diagnosis and management of these patients. This report also shows that gingival enlargement associated with acute lymphocytic leukemia is commonly improved by chemotherapy and minimally invasive periodontal therapy without extensive surgical procedures.

Conflict of interest

The authors have no conflict of interest.

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