

Case Report

Oral manifestation in acute myeloid leukemia: case report

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Abstract

Introduction: Oral changes can be the first signs and symptoms of systemic alterations. It is an alert to the dental surgeon, who can make an early diagnosis of a systemic alteration through oral alterations. Acute myeloid leukemia (AML) is a malignant immunosuppressive disease in which systemic alterations frequently lead to oral alterations as the first sign of the disease. The dentist must be attentive to the possible oral signs to make a quick diagnosis. **Objective:** To describe an unusual oral manifestation of AML, with gingival overgrowth and necrosis located on the interdental papilla on the upper central incisors. **Case report:** A 15-year-old female is described with AML. She presented the following oral changes as the first manifestations of the disease: gingival bleeding, petechiae, and gingival enlargement necrosis located on the interdental papilla on the upper central incisors. The dental surgeon performed an oral evaluation, and, following the clinical signs, the symptoms, and a hematological exam, AML was suspected. The patient was quickly referred to an oncologist, but she died due to the severity of the disease. **Conclusion:** Dentists and multidisciplinary teams have a fundamental role in the early diagnosis of diseases with primary signs in the oral cavity and caring for oncology patients.

Introduction

Oral alterations can be the first signs and symptoms of systemic alterations. They can serve as an alert for the dentist to start investigating the beginning or evolution of some disease. Immunosuppressive conditions often show oral alterations, that in some cases appear as the first clinical manifestations of some diseases [5]. The dentist should identify these signs early, because of the aggressive progression of leukemia [6, 7].

Acute myeloid leukemia (AML) is a malignant immunosuppressive disease affecting the bone marrow, characterized by the uncontrolled growth of undifferentiated blood cells, called blasts, which leads to the loss of the ability of blood cells to differentiate [11]. AML can lead to oral changes such as petechiae, spontaneous bleeding, mucosal ulceration, mucosal pallor, and gingival overgrowth [1, 9]. Besides that, signs, and symptoms such as fever, weakness, fatigue, anemia, pallor, and local infections may be presented by the patients [10]. In patients with these alterations, the dentist's fast diagnosis is important, due to the high mortality and morbidity of that disease [5].

Furthermore, patients with AML can also present oral manifestations consequent of chemotherapy and radiotherapy treatments. This demonstrates the relevance of the dental surgeon in the multidisciplinary team of oncological patients, both in the early diagnosis and treatment of oral manifestations of the disease itself, as well as to prevent and treat the complications of antineoplastic therapy [2, 4, 12].

This clinical case describes an unusual oral manifestation of AML, with gingival overgrowth and necrosis located on the interdental papilla on the upper central incisors.

Case report

A 15-year-old female patient with leukoderma was referred to a periodontist to evaluate her periodontal condition. Her main complaints were pain, bleeding gums, intermittent fever, and recent weight loss.

Her physical examination revealed gingival overgrowth and necrosis located on the interdental papilla on the upper central incisors (Figures 1 and 2). The enlarged gingiva was moderately firm and had a shiny surface. However, there was friable gingival tissue, that tended to spontaneous bleeding.

Due to interdental papilla necrosis, spontaneous gingival bleeding, and hyperplasia, along with signs and symptoms of fever, malaise, and weight loss, the dentist decided to request a complete blood count. The blood test result showed neutropenia,

leukocytosis, thrombocytopenia, and increased blast cell counts (Table I). In the microscopic evaluation of the peripheral blood smears, the presence of Auer rods (Figure 3) was observed, supporting the diagnosis of AML [3, 8]. Taking the intraoral clinical examination with the hematological data, it was possible to suspect AML. Therefore, the patient was immediately referred for onco-hematological care.



Figure 1 - Generalized gingival enlargement



Figure 2 - Initial presentation of a patient exhibiting gingival overgrowth and necrosis located on the interdental papilla

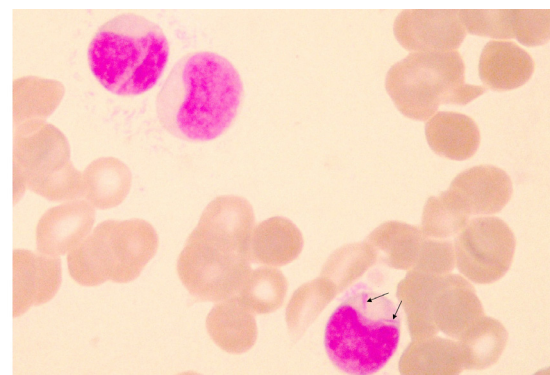


Figure 3 - Blast cells in acute myeloid leukemia showing immature white blood cells with large nuclei with Auer rods (arrows) in peripheral blood smears (Wright Giemsa stain)

Table I - Results of hematological examination

Parameter	Admission value	Reference range
WBC count (cells/mm ³)	27,300	4,000 - 10,000
Blasts (%)	73	0
Segments (M/ μ L)	546	2,055 - 7,720
Lymphocytes (M/ μ L)	4,914	848 - 3,969
Eosinophils (M/ μ L)	0	0 - 883
Basophils (M/ μ L)	0	0 - 100
Neutrophils (M/ μ L)	1,092	2,255 - 8,244
RBC count (million cells/mm ³)	3.99	4.03 - 5.63
Hemoglobin (g/dL)	13	12.1 - 16.2
Hematocrit (%)	38	37.3 - 48.9
Platelet (count/mm ³)	55,000	150,000 - 450,000

WBC: white blood cell; RBC: red blood cell.

Because of the patient's systemic condition, the dental treatment focused on local oral care to control biofilm, as well as on the prevention of the infection. The oral care included meticulous oral hygiene by using a soft bristle toothbrush and 0.12% chlorhexidine rinsed twice a day [5, 12].

Even after an immediate referral to the oncology service after her dental evaluation, the patient died two weeks later, due to the severity of her clinical condition.

Discussion

This clinical report describes the case of a teenage female who was diagnosed with AML. AML is an aggressive malignant disease that affects the bone marrow and interferes with the production of blood cells [2, 12]. The main signs and symptoms associated with hematological alterations are weakness, fatigue, pallor, recurrent infections, and bleeding [10]. Oral signs and symptoms are also high-frequent observed in patients with AML, more so than in other leukemia forms [7, 9]. The oral clinical examination revealed gingival enlargement, spontaneous gingival bleeding, and petechiae; these manifestations are considered some of the first indicators for diagnosing the disease [2, 7, 10].

In this clinical case, the patient's main complaints were pain, gingival bleeding, and overgrowth. Her physical examination revealed gingival overgrowth and necrosis of the interdental papilla in the upper central incisors. Necrosis of the gingival tissue is not a clinical feature frequently observed in AML [6]. Clinical gingival enlargement may suggest alterations due to inflammatory processes, hormonal changes such as pregnancy or puberty, the consumption of drugs, false enlargement, or systemic diseases [2, 5, 9, 10]. In AML, the accumulation of biofilm or calculus does not need to be present for gingival enlargement to appear. This happens because, in this clinical condition, gingival hyperplasia mainly occurs due to the direct infiltration of immature leukocytes (called blasts) in the gingiva, causing gingival enlargement and, consequently, the formation of pseudopockets [8, 9, 12].

The oral signs presented in this case were a consequence of pancytopenia, which occurs systemically [5, 10]. The uncontrolled proliferation of blasts interferes with normal hematopoiesis. Therefore, this results in neutropenia, leukocytosis, thrombocytopenia, and increased blasts in the complete blood cell count [8, 12]. In addition to the hematological examination, the diagnosis of AML required a blood smear to be performed, which revealed the presence of Auer rods. The latter are intracytoplasmic, acidophilic corpuscles, and stick-shaped crystals, a pathognomonic sign of AML [3, 8, 10]. In suspected cases of AML, it is critical to request hematological and histopathological tests for an early and rapid diagnosis of the disease [2].

In approximately 25% of patients with AML, the dentist is involved in diagnosing the disease and can make a fast diagnosis. That can save the life of a patient who has a disease that, if left untreated, can lead to death [1]. Furthermore, poor oral health is related to a higher risk of systemic complications. So, the oncologic patient must have a dental follow-up before, during, and after oncologic treatment [4].

It is crucial that dentists are aware of the possible oral manifestations of systemic conditions. In this case report, the dentist made a quick diagnosis and referred the patient to an oncologist. Due to the severity of the case, the treatment was restricted to the prevention of secondary infections with the prescription of 0.12% chlorhexidine twice a day plus oral hygiene with a soft toothbrush [5, 12].

It is also important that dentists are better integrated into multidisciplinary teams dealing with cancer patients in order to provide care during

all phases of chemotherapy and radiotherapy. Motivating the maintenance of good oral hygiene, performing the dental treatment, and identifying and treating oral alterations will help to prevent infections of oral origin and provide a wider understanding of the patients' needs [6, 12].

Conclusion

Dentists and multidisciplinary teams have a fundamental role in the early diagnosis of diseases with primary signs in the oral cavity and caring for oncology patients.

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References

1. Busjan R, Hasenkamp J, Schmalz G, Haak R, Trümper L, Ziebolz D. Oral health status in adult patients with newly diagnosed acute leukemia. *Clin Oral Investig*. 2018;22(1):411-8.
2. Cammarata-Scalisi F, Girardi K, Strocchio L, Merli P, Garret-Bernardin A, Galeotti A, et al. Oral manifestations and complications in childhood acute myeloid leukemia. *Cancers*. 2020;12(6):1634.
3. El Bayed Sakalli H, Ouazzani Touhami K, Oukkache B. Auer rods in the mature neutrophils of acute biphenotypic leukemia: about one case. *J Clin Med Case Stud*. 2019;4(1).
4. Elad S, Thierer T, Bitan M, Shapira MY, Meyerowitz C. A decision analysis: the dental management of patients prior to hematology cytotoxic therapy or hematopoietic stem cell transplantation. *Oral Oncol*. 2008;44(1):37-42.
5. Francisconi CF, Caldas RJ, Oliveira Martins LJ, Fischer Rubira CM, da Silva Santos PS. Leukemic oral manifestations and their management. *Asian Pac J Cancer Prev*. 2016;17(3):911-5.
6. Gowda TM, Thomas R, Shanmukhappa SM, Agarwal G, Mehta DS. Gingival enlargement as an early diagnostic indicator in therapy-related acute myeloid leukemia: a rare case report and review of literature. *J Indian Soc Periodontol*. 2013;17(2):248-52.
7. Guan G, Firth N. Oral manifestations as an early clinical sign of acute myeloid leukaemia: a case report. *Aust Dent J*. 2015;60(1):123-7.
8. Li Y, Yang W, Wang W, Lin D, Wei H, Wang Y, et al. Auer rods in mixed phenotype acute leukemia, T/myeloid: a report of three cases. *Leuk Res Rep*. 2021;15:100236.
9. López-Valverde N, López-Valverde A, Gómez-de Diego R, Ramírez JM, Flores-Fraile J, Muriel-Fernández J. Gingival hyperplasia as an early manifestation of acute myeloid leukemia. A retrospective review. *J Clin Exp Dent*. 2019;11(12):e1139-e42.
10. McCord C, Johnson L. Oral manifestations of hematologic disease. *Atlas Oral Maxillofac Surg Clin North Am*. 2017;25(2):149-62.
11. Shallis RM, Wang R, Davidoff A, Ma X, Zeidan AM. Epidemiology of acute myeloid leukemia: recent progress and enduring challenges. *Blood Rev*. 2019;36:70-87.
12. Zimmermann C, Meurer MI, Grando LJ, Gonzaga Del Moral J, da Silva Rath IB, Schaefer Tavares S. Dental treatment in patients with leukemia. *J Oncol*. 2015;2015:571739.