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Case Report

A Case of Gingival Enlargement in Acute Myeloid Leukemia

Sara Soheylifar[1] • Mohammad Vahedi[2] • Mahdi Kadkhodazadeh[3*] • Mohsen Jali Bidgoli[1]

[1]Post-graduate Student, Department of Periodontics, Faculty of Dentistry, Hamadan University of Medical Sciences, Hamadan, Iran
[2]Assistant Professor, Department of Oral Medicine, Faculty of Dentistry, Hamadan University of Medical Sciences, Hamadan, Iran
[3]Assistant Professor, Department of Periodontics, Faculty of Dentistry, Hamadan University of Medical Sciences, Hamadan, Iran
[*]Corresponding author; E-mail: kadkhodazadeh@umsha.ac.ir

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Abstract

Periodontal findings of a 19-year-old female with previously undiagnosed acute myeloid leukemia (AML) are presented. Intra-oral examination revealed generalized gingival enlargement, inconsistent with the amount of calculus. Chemotherapy for chorio-carcinoma was a prominent note in history. Ruling out other etiologies, second CBC and peripheral blood smear results confirmed AML. Six week after chemotherapy for AML, patient received scaling and root planning and the gingival enlargement was noticeably reduced.

Key words: Choriocarcinoma, gingival enlargement, leukemia, periodontitis.

Introduction

Periodontal disease is a multifactorial chronic inflammatory disease for which several susceptibility and risk factors are proposed. Many systemic diseases and disorders have been implicated as risk indicator or risk factors in different forms of periodontal disease.[1-5]

There are many types of periodontal disease, one of which is "gingival overgrowth" or "gingival enlargement." Gingival enlargement can be caused by a wide variety of etiologies and is classified according to these etiologic factors:[6]

1. Inflammatory enlargement
2. Drug-induced enlargement
3. Enlargement associated with systemic diseases or conditions:
   a. Conditioned enlargement (pregnancy, puberty, vitamin C deficiency, plasma cell gingivitis, nonspecific conditioned enlargement)
   b. Systemic diseases causing gingival enlargement (leukemia, granulomatous diseases)
4. Neoplastic enlargement

In this paper, we report a case of gingival enlargement due to acute myeloid leukemia.

Case Report

A 19-year-old female attended the Department of Periodontics, Hamadan University of Medical Sciences, Hamadan, Iran, with the chief complaint of generalized gingival enlargement, beginning from two months before. Intra- and extra-oral examinations and then evaluation of medical and dental history were done. Intra-oral examination revealed enlargement was generalized in maxilla and left side of mandible (Figure 1). There was a fair amount of plaque and calculus, but did not justify the amount of enlargement. A pseudomembrane near the left mandibular first molar was also observed. In extra-oral examination, the patient had pain and tender-

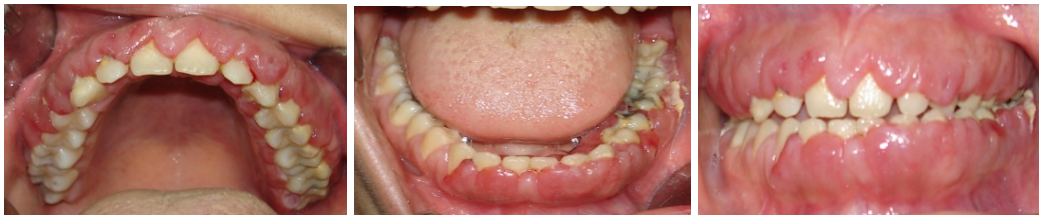

Figure 1. Generalized gingival enlargement.

ness in supraclavicular lymph nodes as well as a pale appearance. Evaluation of medical history revealed that the patient was under chemotherapy for 1 year ending 5 months before, for a curetted mole which had appeared during pregnancy and converted to choriocarcinoma.

Patient had severe pain in the left mandibular first molar since 3 months before, for which she had not sought dental care. Scaling had been done by a general dentist for gingival enlargement, but the enlargement had persisted.

A complete blood count (CBC) was ordered for the patient and the results were as follows: white blood cell (WBC): 9000; RBC: 3.8; Neutrophils: 53%; Lymphocytes: 47%; Hemoglobine (Hb): 9.8; Hematocrit: 28; and MCV: 73.7.

The following differential diagnoses were considered: Inflammatory enlargement, drug-induced enlargement, conditioned enlargement, systemic enlargement, and neoplastic enlargement. Because of unilateral chewing due to tooth pain and subsequent plaque accumulation, an inflammatory nature of the enlargement was suspected. However, generalized enlargement in maxilla and lack of consistency between local factors and amount of enlargement resulted in doubting to this etiology. There was no history of consumption of hydantoins/other anticonvulsants, calcium channel blockers or Cyclosporine A. In addition, no immune suppressants were used during the course of chemotherapy that would result in gingival hyperplasia. Furthermore, hyperplasia had started three months after the end of chemotherapy. Gingival enlargement due to pregnancy was ruled out as a new β-HCG "pregnancy hormone" test proved negative.

Clinical symptoms indicated a probability for leukemia and leukemic enlargement. The result of CBC showed normal WBC count and differential. However, considering the amount of hemoglobin and percent of hematocrit, another CBC and a peripheral blood smear (PBS) was ordered. Another β-HCG test was ordered after consultation with a specialist. Results were as follows: WBC: 30000; hemoglobin: 9.5; Platelet: 15000; β-HCG: negative; blast cells (peripheral blood smear): 94%. PBS was checked another time to confirm the results. Therefore, the diagnosis of acute myeloid leukemia (AML) was established and the patient was referred to an oncologist.

Oral hygiene instruction was given to the patient and 0.2% chlorhexidine was prescribed. Scaling and root planning was postponed since the treatment needs a minimum platelet count of 60000 in this condition.

Further tests such as bone marrow aspiration and biopsy were done by the oncologist, and the patient was hospitalized with a diagnosis of AML type M5.

After a period of chemotherapy, 6 weeks after the first visit, gingival enlargement had decreased (Figure 2). With a platelet count of 75000, scaling and root planning was performed. The patient, however, died after two weeks as a result of delayed treatment of AML.

Discussion

All blood cells play an essential role in the maintenance of a healthy periodontium. WBCs are involved in inflammatory reactions and are responsible for cellular defense against microorganisms as well as for proinflammatory cytokine release. The leukemia is a malignant neoplasia of WBC precursors characterized by (1) diffuse replacement of the bone marrow with proliferating leukemic cells, (2) abnormal numbers and forms of immature WBCs in the circulating blood, and (3) widespread infiltrates in the liver, spleen, lymph nodes, and other body sites.[7]

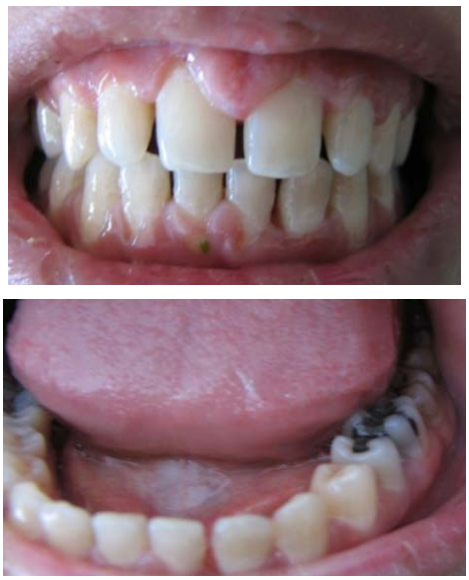

Figure 2. Six weeks after the first visit.

According to the lineage of WBC involved, leukemias are classified as lymphocytic or myelocytic*;* a subgroup of the myelocytic leukemias is monocytic leukemia. According to their evolution, leukemias can be acute, which is rapidly fatal; sub-acute; or chronic. In acute leukemia, the primitive "blast" cells are released into the peripheral circulation, whereas in chronic leukemia, the abnormal cells tend to be more mature with normal morphologic characteristics and function when released into the circulation.[7]

Oral and periodontal manifestations of leukemia consist of leukemic infiltration, bleeding, oral ulcerations, and infections. The expression of these signs is more common in acute and sub-acute forms of leukemia than in chronic forms. Leukemic cells can infiltrate the gingiva and less frequently the alveolar bone.

A study of 1076 adult patients with leukemia showed 3.6% of the patients with teeth had leukemic gingival proliferative lesions, with the highest incidence in patients with acute monocytic leukemia (66.7%), followed by acute myelocytic-monocytic leukemia (18.7%) and acute myelocytic leukemia (3.7%).[7]

AML has many types including M0 (undifferentiated leukemia), M1 (acute myeloblastic leukemia), M2 (acute myeloblastic leukemia with maturation), M3 (acute promyelocytic leukemia), M4 (acute myelomonocytic leukemia), M5 (acute monocytic leukemia), M6 (acute erythroblastic leukemia), and M7 (acute megakaryoblastic leukemia).[8-10] Gingival enlargement is more common in M4 and M5 types.[11] There are many risk factors for leukemia, including genetics, certain carcinogens (benzene, tobacco smoke, ionizing radiation), advancing age (most important), and receiving certain types of chemotherapy to treat other cancers (secondary AML). The latter, according to the history, may be the case in this patient. It can be suggested that the choriocarcinoma and the course of chemotherapy to treat it may be a risk factor for AML and a guide for clinicians in differential diagnosis of the condition.

Finally, getting an accurate history is very important for diagnosis, prognosis and treatment planning in all patients. Additionally, a regular follow-up should be considered.

References

1. Page RC. The pathobiology of periodontal diseases may affect systemic diseases: inversion of a paradigm. *Ann Periodontol* 1998;3:108-20.
2. Kidambi S, Patel SB. Diabetes mellitus: considerations for dentistry. *J Am Dent Assoc* 2008;139:8S-18S.
3. Persson GR, Persson RE. Cardiovascular disease and periodontitis: an update on the associations and risk. *J Clin Periodontol* 2008;35:362-79.
4. Lamster IB, DePaola DP, Oppermann RV, Papapanou PN, Wilder RS. The relationship of periodontal disease to diseases and disorders at distant sites: communication to health care professionals and patients. *J Am Dent Assoc* 2008;139:1389-97.
5. Martos R, Márton I. Correlations between dental-oral infections and cardiovascular disease. *Fogorv Sz* 2008;10:101-5.
6. Seymour RA. Effects of medications on the periodontal tissues in health and disease. *Periodontol 2000* 2006;40:120-9.
7. Dreizen S, McCredie KB, Keating MJ, Luna MA. Malignant gingival and skin "infiltrates" in adult leukemia. *Oral Surg Oral Med Oral Pathol* 1983;55:572-9.
8. Kröger N, Brand R, van Biezen A, Zander A. Risk factors for therapy-related myelodysplastic syndrome and acute myeloid leukemia treated with allogeneic stem cell transplantation. *Haematologica* 2009;10:105-109.
9. Hijiya N, Ness KK, Ribeiro RC, Hudson MM. Acute leukemia as a secondary malignancy in children and adolescents: current findings and issues. *Cancer* 2009;115:23-35.
10. Weinel S, Malone J, Jain D, Callen JP. Therapy-related leukaemia cutis: a review. *Australas J Dermatol* 2008;49:187-90.
11. Robbins SL, Cotran RS, Kumar V. *Pathologic Basis of Disease*, 4th ed. Philadelphia: Saunders; 1989.