

Periodontist an Asset to Systemic Diagnosis — Diagnosing a Case of Acute Myeloid Leukaemia

Somnath Pralhad Pachrupe^{1*}, Mangesh Phadnaik² and Pooja Gupta¹

¹Department of Periodontics and Implantology, Aditya Dental College, Beed – 431122, Maharashtra, India; somnath.pachrupe@gmail.com, dr.poojagupta6342@gmail.com

²Department of Periodontology, Government Dental College and Hospital, Nagpur – 440003, Maharashtra, India; drmbphadnaik@gmail.com

Abstract

Acute Myeloid Leukemia (AML) is a neoplastic disease of bone marrow. AML M3 variant frequently develops swiftly and if not intervened immediately may prove fatal. This report presents a 32-year-old female who reported to dental OPD with complaint of bleeding gums and no previous medical history. On examination suspicious lesions were seen and patients was advised for full blood workup and Peripheral Blood Smear (PBS) investigations which revealed features suggestive of AML M3. The significant findings of this case are just presentation of oral manifestations, quick progression from initial symptoms to end stage and mild increase in WBC count which is uncommon for AML M3 variant. For many types of cancer, finding it early might make it uncomplicated to treat. This report outlines how a periodontist proved to be an asset in diagnosing a case of AML.

Keywords: Acute Myeloid Leukemia, Oral Manifestations, Periodontist

1. Introduction

The word leukaemia literally means “White Blood” because it is a neoplastic proliferation of white blood cells, typically leukocytes. Leukaemia is a miscellaneous group of hematological disorders. It is characterized by unorganized multiplication of neoplastic cells. Leukemic cells can invade multiple systems such as central nervous system, spleen, lymph nodes and sometimes even penetrate into skin, and gingiva¹.

Leukaemia is classified according to its clinical presentation as acute or chronic; and according to histogenetic orientation as lymphocytic or myelocytic. Acute leukaemia's are divided as Acute Lymphoid Leukaemia (ALL) and Acute Myeloid Leukemia (AML) and both ALL and AML are further subdivided within the French-American-British (FAB) classification. According to FAB classification AML is further classified from M0-M7 based

on cell type from which leukaemia develops and its degree of maturity.

Leukaemia predominantly affects males compared to females. ALL presents 5-year survival rate of >90% in many advanced cancer research institute, however advanced care is not available in many developing countries. Advances in treating AML is also not so spectacular and shows about 5-year overall survival rate approaching 70%². AML accounts for approximately 20% of acute leukaemia in children and 80% of acute leukaemia in adults³.

Fundamental consequence of leukaemia is neoplastic growth of leukemic cells in uncommon body areas. Most dominant effect of leukemia on body is surplus use of metabolic substrates such as amino acids and vitamins by swiftly growing leukemic cells. Erstwhile leukemic tissues thrive, other tissues decline. After this process continues long enough, it alone is enough to cause death.

*Author for correspondence

2. Case Report

A 32-year-old patient with poor socioeconomic background reported to dental OPD with bleeding gums, swelling and pain from right upper side of jaw since past 6 days. Patient reported with feeling of lethargy and decreased appetite. Patient shows negative medical history.

Extra orally swelling present on right side of face and palpable and tender right submandibular lymph nodes. Intra oral examination revealed generalized gingival inflammation, bluish colored pedunculated lesion with respect to 43 and necrosed papilla with respect to 15, 16 in (Figure 1). Lesion with respect to 43 turned necrotic on day 2 of observation (Figure 2) and sloughed off on day 3 (Figure 3). Patient has poor oral hygiene and moderate plaque and calculus. Intraoral radiographs with respect to 43, 15 and 16 are insignificant.



Figure 1. Bluish colored pedunculated lesion with respect to 43 and necrosed papilla with respect to 15, 16.



Figure 2. Necrotic lesion with 43.



Figure 3. Sloughed off lesion with 43.

Differential diagnosis includes Acute Necrotising Ulcerative Gingivitis (ANUG), Necrotising Ulcerative Periodontitis (NUP), Human Immunodeficiency Virus (HIV) and Anaemia. Analgesics and chlorhexidine mouthwash was advised for symptomatic relief.

Patient was recalled next day for consultation with oral medicine and general medicine specialist of the institute. At consultation she reported increased pain with 43 and necrotic changes with interdental papilla. She was questioned for any history of bleeding tendency during menstruation but she gave negative history for the same. She was further advised for full blood investigations and Erythrocyte Sedimentation Rate (ESR).

Haematology results (Table 1) revealed decreased Haemoglobin (Hb), mildly increased total leukocyte count, significant increase in monocyte count and depleted platelets. ESR was also grossly elevated. Upon these results she was advised by general medicine specialist for peripheral blood smear, which showed increased blasts and promyelocytes (80%), cells showed bilobed nuclei with 2-3 nucleoli and cytoplasm displayed granularity with auer rods. All these features are suggestive of AML M-3. Bone biopsy was suggested to confirm the diagnosis of leukaemia, however given the haematological findings at that given time it was decided to perform the same at a later date.

Table 1. Haematological findings

	Patient	Reference range
Haemoglobin (Hb)	5.20gm/dl	12-15.8gm/dl
Total Leukocyte Count (TLC)	14500/cumm	4000-11000/cumm
Neutrophils	54%	40-70%
Lymphocytes	28%	20-50%
Eosinophils	01%	0-6%
Monocytes	18%	4-8%
Basophils	00%	0-2%
Platelets	93000 cumm	150000-450000 cumm
Mean Cell Volume (MCV)	95 μ m ³	75-95 μ m ³
Mean Cell Haemoglobin (MCH)	29.4pg	26.7-31.9pg
Mean Cell Haemoglobin Concentration (MCHC)	31.1g/dl	32.3-35.9g/dl
Packed Cell Volume (PCV)	16.8%	40-54%
Red Blood Cell (RBC) count	1.78 millions/cumm	4-6 millions/cumm
Erythrocyte Sedimentation Rate (ESR)	51mm	2-12mm
<i>Atypical haematological findings are highlighted in bold</i>		

3. Discussion

Oral lesions are reported to be initial features for acute cases and thus a chief indicator in diagnosis of Leukemia⁴. Oral manifestations such as gingival swelling, bleeding, petechiae, ulceration and ecchymosis are seen in Leukeima^{5,6}. 5% of leukaemia cases present with gingival infiltrations as initial complications of AML^{1,7}. Drezen et al., reported patients with AML had greatest incidence of gingival infiltrates (M5-66.7%), followed by AML (M4-18.5%) and AML (M1, M2-3.7%)⁸.

ANUG sometimes present as necrotic and ‘punched-out’ ulcerative lesion of interdental papilla and thus considered in differential diagnosis⁹. It also presents excessive salivation, metallic taste and malodour but does not show ecchymosis which was present in this case. NUP was also considered as a differential diagnosis as necrotic

lesions sloughed off leading to loss of attachment. Oral lesions are quite often the presenting feature of patients with HIV. However, based on the clinical features and peripheral blood smear report the diagnosis of acute myeloid leukaemia M3 was confirmed. Cytogenetic studies were not at hand at the institute then and hence were not performed on this case to confirm the diagnosis.

The present case was distinctive in regards with no previous history of bleeding except gingival bleeding since one week. The only lesions present were multiple necrosed papilla. This case was unconventional for M3 variant in not presenting with significant hyperleucocytosis which is uncommon for AML M3. Infact few cases reported with AML-M3 variant reported with leucopenia^{10,11}.

In the present case it was decided to perform supragingival scaling before hospital stay as patient presented with pain in maxillary and mandibular gingival, also it would likely reduce the plaque accumulation and help improve the quality of life during the hospital stay. Patient was also adviced to use chlorhexidine as oral hygiene regimen for daily reduction of bacterial loads. Later the patient was admitted to the hospital and was advised to report to a special cancer institute for chemotherapy but could not report there due to poor economic status. However unfortunately within a week of admission patient died of Disseminated Intravascular Coagulation (DIC).

This case underlies the importance of early detection of such systemic diseases. Dental professionals should have high degree of suspicion for such necrotic gingival lesions and immediately refer such cases to specialists. Although medical practitioners most commonly establish the diagnosis of leukemia, dental practitioners were accountable for commencing the diagnosis in 25% of cases with acute myelogenous leukemia and 33% of cases with acute myelomonocytic leukemia^{7,12}.

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