

Acute Myeloid Leukemia and Granuloma: Incidental Partners in the Bone Marrow

Ruchee Khanna*, Deepak Nayak M**, Chethan Manohar***, Sushma V.Belurkar****, Akshatha N*****

* Associate Professor, Department of Pathology, Kasturba Medical College, Manipal, Manipal University

** Assistant Professor, Department of Pathology, Melaka Manipal Medical College, Manipal, Manipal University.

*** Professor, Department of Pathology, Kasturba Medical College, Manipal, Manipal University

**** Associate Professor, Department of Pathology, Kasturba Medical College, Manipal, Manipal University

***** Junior Resident, Department of Pathology, Kasturba Medical College, Manipal, Manipal University.

Abstract- An association of acute myeloid leukemia (AML) with a granuloma has seldom been reported in the literature. We report a case where 62-year old male, diagnosed as AML on the bone marrow had a co-incidental epithelioid granuloma. The work up for common causes such as tuberculosis and fungal elements were negative. This case raises a pertinent question on the simultaneous association between AML and granulomas. In the present case, the three follow-up has so far been uneventful.

Index Terms- acute myeloid leukemia; granuloma; bone marrow.

I. INTRODUCTION

Bone marrow granulomas are an infrequent finding in a bone marrow biopsy. The incidence may range from 0.3% to 2.2%, depending on the series.¹⁻³ A wide variety of diseases have been implicated in the formation of granulomas in the bone marrow, but they are not specific and do not usually show characteristic features that typify a specific diagnosis.⁴ An association of acute myeloid leukemia (AML) with a granuloma has seldom been reported in the literature.⁵ We report a rare instance where granulomas and AML were seen co-existing in the bone marrow.

II. CASE REPORT

A 62-year old male presented to the casualty with presenting complaints of low-grade fever with chills and rigors. He also had generalized body ache and loss of weight. On examination, mild hepatosplenomegaly was appreciated. The rest of the general and systemic examinations were within normal limits.

The blood examination was as follows: hemoglobin: 7.4 g/dL, total leucocyte count: 4.4×10^3 cells/ cu.mm. and platelets: 92×10^3 / cu.mm. The peripheral smear showed a mild pancytopenia. The differential counts showed 52% myeloblasts; suggestive of acute myeloid leukemia. A bone marrow study was requested to subtype the neoplasm. Other baseline investigations including renal function tests and serum electrolytes were within normal limits. Liver function tests showed a mild elevation of enzymes.

The bone marrow aspirate study revealed >90% blasts (Figure 1). The findings of the cytochemistry panel comprising of myeloperoxidase (MPO), sudan black B (SBB) and periodic

acid schiff (PAS) were suggestive of myeloblasts. A final diagnosis of acute myeloid leukemia (AML) was given.

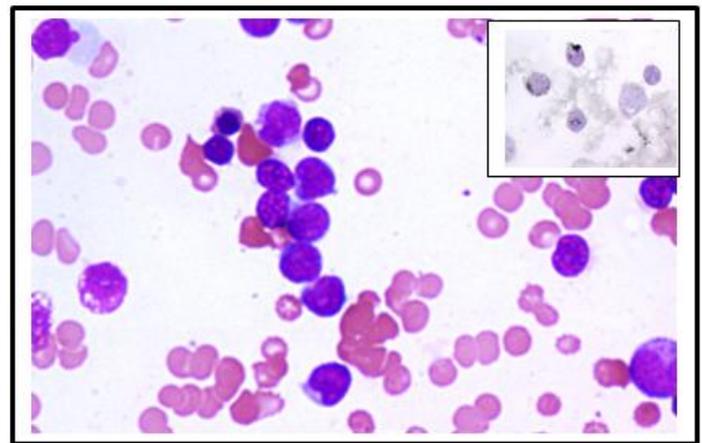


Figure 2: Bone marrow aspirate smear showing myeloblasts (Leishman x 200). Inset showing positivity for SBB.

The trephine biopsy showed a cellular marrow with a diffuse replacement of hematopoietic elements by myeloblasts. The marrow also showed discrete well-formed epithelioid granulomas and aggregates of mature lymphocytes (Figure 2). Neither necrosis nor multinucleated giant cells were seen. Special stains for acid-fast bacilli (AFB) and fungi were negative.

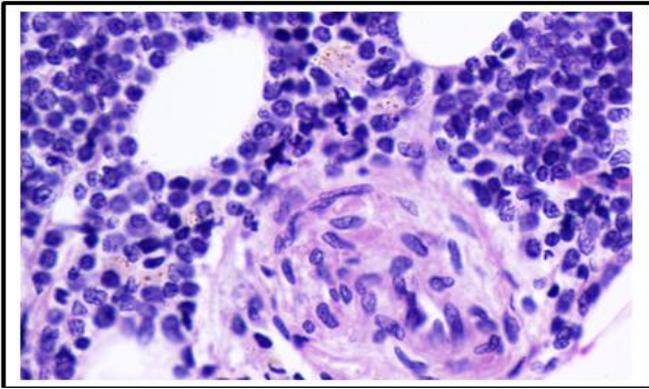


Figure 2: Trephine biopsy showing sheets of myeloblasts with an epithelioid granuloma (Hematoxylin & Eosin; x200)

A final diagnosis of acute myeloid leukemia (AML) with a granulomatous lesion was given and a follow up was requested.

III. DISCUSSION

Malignant neoplasms have been reported as the cause of bone marrow granulomas in 20% to 25% of the cases; a vast majority being attributed to Hodgkin and less commonly, non-Hodgkin lymphoma¹⁻⁵. Acute myeloid leukemia (AML) is an aggressive hematolymphoid neoplasm with characteristic bone marrow findings. An incidental finding of a simultaneous lesion such as a granuloma in the biopsy section is rare and requires a detailed investigation. AML has been previously reported in association with granulomas of sarcoidosis in varied case reports.⁶⁻⁹

The aetiology of the epithelioid granulomas in leukemia has been extensively researched. Some studies have led to a hypothesis that there is a strong induction of anti-leukemic immune response to tumour-associated antigens and a high incidence of circulating immune complexes in AML patients.^{10,11} Reich had suggested that if the presence of granulomatous inflammation within tumours or tumour-draining lymph nodes represents an immunologic response to a large variety of insoluble antigens, a multisystem granulomatous inflammation may occur in instances in which the tumour antigens were widespread, such as leukaemia.¹² With reference to our case, this hypothesis provides a plausible explanation for the simultaneous existence of granuloma and AML.

The presence of a granulomatous lesion along with a hematolymphoid neoplasm has been associated with a good prognosis; particularly in patients with Hodgkin's disease.^{13,14} With reference to acute myeloid leukemia, the data regarding the prognosis of the neoplasm when a granuloma is seen is insufficient. In the sporadic cases of AML with sarcoidosis reported in the literature, the granulomatous lesion was observed both before and after the diagnosis of AML^{15,16}. There is also a reported case of a 17-year time interval between the two diagnoses.⁶ These cases raise a pertinent question: is the association between AML and granulomas causal or coincidental? In the present case, the three follow-up has so far been uneventful.

To conclude, we report a case of an acute myeloid leukemia where a granulomatous lesion was coincidentally noted in a bone marrow biopsy section. The association between AML and granuloma in the published literature is extremely sporadic. Moreover, the nature and strength of this association has never been scrutinized. An analysis of all these cases might help resolve the questions on the pathogenesis and provide answers to the AML-granuloma relationship.

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AUTHORS

First Author – Ruchee Khanna, Associate Professor, Department of Pathology, Kasturba Medical College, Manipal, Manipal University

Second Author – Deepak Nayak M, Assistant Professor
,Department of Pathology, Melaka Manipal Medical College,
Manipal, Manipal University

Third Author – Chethan Manohar, Professor, Department of
Pathology, Kasturba Medical College, Manipal, Manipal
University

Fourth Author – Sushma V.Belurkar, Associate Professor,
Department of Pathology, Kasturba Medical College, Manipal,
Manipal University

Fifth Author – Akshatha N, Junior Resident, Department of
Pathology, Kasturba Medical College, Manipal, Manipal
University.

Correspondence Author – Dr. Ruchee Khanna,, Associate
professor, Dept. of Pathology, Kasturba Medical College,
Manipal -576104, India, Phone: 08202923178, 9964428199,
Email: drruchi2003@yahoo.com