Incidental tuberculoid granuloma in bone marrow biopsy in 17-year-old male patient: A case report

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ABSTRACT

Granulomas are susceptible to infrequent finding in bone marrow biopsies and may be associated with a broad spectrum of infectious and non-infectious disorders. The incidence of bone marrow granulomas is reported in 0.3% to 3% of bone marrow biopsies with tuberculoid granulomas constituting 6% to 48% of cases. Here, we report the case of a 17-year-old boy with a history of fever (pyrexia of unknown origin). There was no organomegaly and lymphadenopathy with incidental tuberculoid granuloma on bone marrow biopsy.

Keywords: *Bone marrow biopsy, Granuloma, Tuberculosis, Pyrexia of unknown origin.*

Bone marrow examination is an important diagnostic tool to evaluate various disorders including both neoplastic and non-neoplastic hematological diseases. It is helpful in the diagnosis of hematological malignancies, granulomatous infections, Kala-azar, Human immunodeficiency virus infection (HIV), other granulomatous disorders and hemolytic states. Granuloma is a relatively common finding of bone marrow biopsies and can be caused by a spectrum of underlying infectious and non-infectious disorders.

Many diseases have been implicated in the formation of granulomas like tuberculosis, fungal, sarcoidosis, Q fever, etc. in the bone marrow but they are not specific and do not usually show characteristic features that typify a specific diagnosis [1]. The incidence of bone marrow granulomas (BMGs) is reported in 0.3% to 3% of bone marrow biopsies with tuberculoid granulomas constituting 6% to 48% of cases. BMGs caused by TB indicate an advanced stage with high mortality in TB patients [2]. We report the case of a 17-year-old boy with pyrexia of unknown origin (PUO) and incidental tuberculoid granuloma on bone marrow biopsy.

CASE REPORT

A 17-year-old male patient presented with complaints of fever, generalized body aches and headache from the last 4 months. Fever was of low-moderate grade, recorded up to 101 degrees Fahrenheit, not associated with chills or rigors and used to relieve with medications. History of loss of appetite was present with a history of loss of weight. There was no history of cough with any expectoration. Family history reveals that his elder brother had tuberculosis and was on anti-tubercular treatment (ATT).

On examination, his vitals were stable with a blood pressure of 110/70 mmHg, pulse rate of 80/min and respiratory rate of 12/min. He had only pallor. There was no evidence of hepatosplenomegaly and any lymphadenopathy. Mantoux test of the patient was negative and the chest X-ray was normal, so tuberculosis was excluded. He was then treated on the lines of a suspected autoimmune disease with steroids, on which he showed no response. His hemogram was as follows: hemoglobin-9.5g%, total leukocyte count (TLC)-8000/mm3, platelet count-450,000/mm3, differential leukocyte count-polymorphs-80%, lymphocytes-10%, monocytes-02%, and eosinophils-nil.

A bone marrow examination was performed as workup of PUO despite negative blood and urine cultures. The bone marrow aspirate was normocellular for age. The erythroid series showed normoblastic maturation with megaloblastic change. The myeloid and megakaryocytic series were unremarkable. The bone marrow biopsy showed few epithelioid cell granulomas with foreign body giant cell reaction and foci of necrosis. No fungal bodies or atypical cells were identified (Fig. 1). The biopsy section was then stained with Ziehl Neilson (ZN) stain (20%) which was positive for acid-fast bacilli (Fig. 2).

Hence, a diagnosis of tuberculosis of bone marrow was given. The patient was started on ATT (Isoniazid 5mg/kg, Rifampicin 10mg/kg, Pyrazinamide 25mg/kg, Ethambutol 15mg/kg for 2 months intensive phase followed by Isoniazid, Rifampicin, Ethambutol for the next 4 months in continuation phase).

DISCUSSION

Making an exact etiological diagnosis is essential in clinical strategy. In general, non-invasive samples which are easy to access, for example, saliva, sputum, serum, plasma, blood, urine, tissue, fecal water, or feces, commonly meet the need in diagnosis

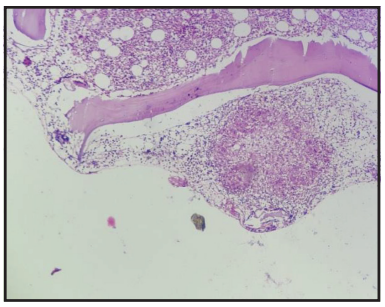

Figure 1: Microphotograph of H&E stain depicting granuloma with necrosis (40x).

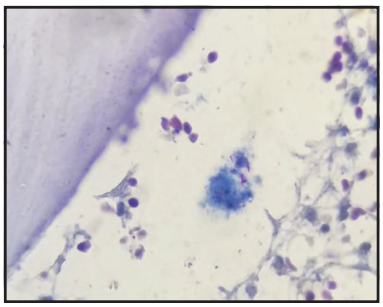

Figure 2 : Microphotograph of ZN stain (20%) depicting Acid fast bacilli (100x).

with most of the diseases [3]. However, a bone marrow biopsy is also feasible and even needful on some occasions, such as the FUO or hematological abnormality, to identify an underlying disorder. Bone marrow granuloma is one such finding on bone marrow biopsy which can help diagnose unrelated diseases including malignant lesions; viral, bacterial and fungal infections, autoimmune diseases, drugs and sarcoidosis [1].

Beckers D et al in their study stated that epithelioid granulomas are found in less than 1% of bone marrow samples [4]. The incidence of BMG is reported in 0.3% to 3% of bone marrow biopsies [5]. Hugo L et al in 2013 and Kejriwal et al in 2001 also found infections to be the most common cause followed by neoplasms and connective tissue diseases for granulomas in bone marrow [4,6].

Sarcoidosis is one of the most frequent causes of BMG. It is responsible for 3% to 32% of the cases of bone marrow granuloma, the average being around 10%. Typhoid fever is another common cause of bone marrow granuloma. Chronic granulomatous inflammation was the most common finding on bone marrow biopsies and was associated with hemophagocytosis [7]. Fibrin-ring granulomas, once thought to be characteristic of Q fever, can be seen in patients with Hodgkin's disease, cytomegalovirus (CMV), Epstein-Barr virus (EBV) infection, Hepatitis A, Giant cell arteritis and leishmaniasis. Brucellosis is also a frequent and well-established cause for BMGs found in 28% to 68% of cases [8]. Tuberculosis is one of the most frequent causes of BMG as it constitutes 6% to 48% of cases [1]. In cases of miliary tuberculosis, 33% to 100% of bone marrow biopsies show granulomas. Yet, caseation necrosis is uncommon (29%) and the presence of acid-fast bacilli by the ZN stain is rare [2]. The lowest recovery of organisms by culture was from the bone marrow (15%) as compared with the sputum (78%) [9]. BMG caused by TB indicates an advanced stage with high mortality in TB patients [8]. However, a bone marrow biopsy remains an important examination in the patients of fever of unknown origin [10], especially in immunocompromised patients [11].

CONCLUSION

Bone marrow aspiration and biopsy are very helpful in the diagnosis of granulomatous lesions in the bone marrow which can be elemental to diagnose cases of PUO. The histologic finding of a BMG; although rarely pathognomonic, points towards a well-known spectrum of diseases. Consideration of the clinical data and communication between the pathologist and primary care physician should help clarify the cause.

REFERENCES

1. Eid A, Carion W, Nystrom JS. Differential diagnoses of bone marrow granuloma. West J Med. 1996;164:510-5.
2. Kinoshita M, Ichikawa Y, Koga H, Sumita S, Oizumi K. Re-evaluation of bone marrow aspiration in the diagnosis of miliary tuberculosis. Chest. 1994;106:690-2.
3. Medina S, Dominguez-Perles R, Gil JI, Ferreres F, Gil-Izquierdo A. Metabolomics and the diagnosis of human diseases—a guide to the markers and pathophysiological pathways affected. Curr Med Chem. 2014;21:823-48.
4. Brackers de Hugo L, Ffrench M, Broussolle C, *et al*. Eur J Intern Med. 2013;24:468-73.
5. Wang Y, Tang XY, Yuan J, Wu SQ, Chen G, Zhang MM *et al*. Bone marrow granulomas in a high tuberculosis prevalence setting. Medicine (Baltimore). 2018;97:4.
6. Kejariwal D, Sarkar N, Chakraborti SK, Agarwal V, Roy S. Pyrexia of unknown origin: a prospective study of 100 cases. J Postgrad Med. 2001;47:104-7.
7. Kinoshita M, Ichikawa Y, Koga H, Sumita S, Oizumi K. Re-evaluation of bone marrow aspiration in the diagnosis of miliary tuberculosis. Chest 1994;106:690-2.
8. Achi HV, Ahui BJ, Anon JC, Kouassi BA, Dje-Bi H, Kininlman H. Pancytopenia: a severe complication of miliary tuberculosis. Rev Mal Respir. 2013;30:33-7.
9. White RM, Johnston CL Jr. Granulomatous bone marrow disease in Virginia: Study of 50 cases. Va Med. 1985;112:316-9.
10. Gandolfo E, Bruno G, Vitali E, Ferrero S, Pagano G. Tuberculosis as a cause of fever of unknown origin in the elderly: a case report. Ann Ital Med Int. 2002;17:117-20.
11. Hot A, Schmulewitz L, Viard JP, Lortholary O. Fever of unknown origin in HIV/AIDS patients. Infect Dis Clin North Am. 2007;21:1013-32;ix.

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