(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 6, Issue 1 , Page No: 497-504
January-February 2023

IJMSCR

Role of Bone Marrow Biopsy in Hodgkin's Lymphoma – A Study At Tertiary Care Centre Of Northern India

[1]Dr. Parul Gautam, [2]Dr. Anjana Mittal , [3]Dr. Manju Raghav, [4]Dr. Chetna Mehrol,
[1,4]Assistant Professor, [2]Professor,[3]Professor and Head
Department of Pathology, Mahatma Gandhi University Of Medical Sciences and Technology, Jaipur

***Corresponding Author:**
Dr. Chetna Mehrol
Assistant Professor, Department of Pathology, Mahatma Gandhi University of Medical Sciences and Technology, Jaipur

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Keywords: NIL

Introduction

Average Incidence of marrow involvement in Hodgkin's disease (HD) is 10%[1] with range of 3-18%

The different histological types of HL can be identified on BM biopsy with mixed cellularity being most common and rarest is lymphocyte depleted[2]

BM involvement indicates vascular dissemination and hence upstages patient's disease to stage IV which further [2, 3]influences treatment plans, prognosis and obviates the need for other investigations required to stage the patient

Extra nodal primary HL is rare and isolated BM lymphoma is even extremely rare. So we should correlate clinically to rule out for primary marrow involvement or any systemic manifestation[3, 4, 5]

We present here a study of 35 cases of HL to assess frequency of BM involvement in HL & to determine morphological changes in BM.

Materials and Methods

This study is a Retrospective analysis of 35 cases - over a period of 4 years.

BMB was routinely processed & stained with haematoxylin & eosin for all cases. Special stains & immunohistochemistry (IHC) was done wherever possible.Relevant clinical details were recorded in all cases .Criteria for BM involvement in HD (McKenna & kroft, 2001)[6] -

CERTAIN- Typical RS cells or mononuclear variants in characteristic cellular environment

SUGGESTIVE- Atypical Histiocytes or characteristic cellular background

SUSPICIOUS- Fibrosis/Necrosis alone.

Observations and Results

- Total no. of cases: 35
- Cases with Bone marrow involvement: 10(28.6%)
- Sex Distribution:
  - Males - 8 (80%)
  - Females - 2 (20%)
- Age Distribution: (Fig-1)
  - Range 3-55yr
  - Mean -31yr
- **Histopathological findings**

1. Focal involvement was found in 6 cases and diffuse pattern in 4 cases**.(**Fig-2&3)
2. Polymorphous infiltrate of lymphocytes, eosinophils, plasma cells, neutrophils and histiocytes in all cases

3. Classical RS cells - 1 case
4. Mononuclear cells - 7 cases (Fig-4)
5. Focal necrosis - 3 cases(Fig-5)
6. Granulomas - 2 cases(Fig-6)
7. Gelatinous marrow transformation - 1 case
8. Reticulin – Increased in all cases to Grade 3-4 (Fig-7)

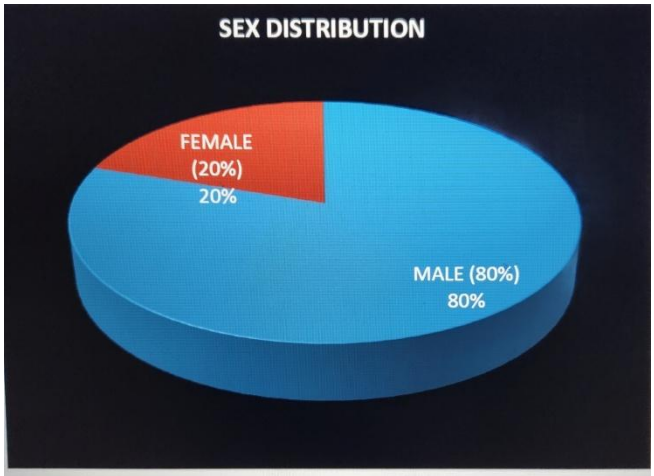

FIGURE-1-sex distribution

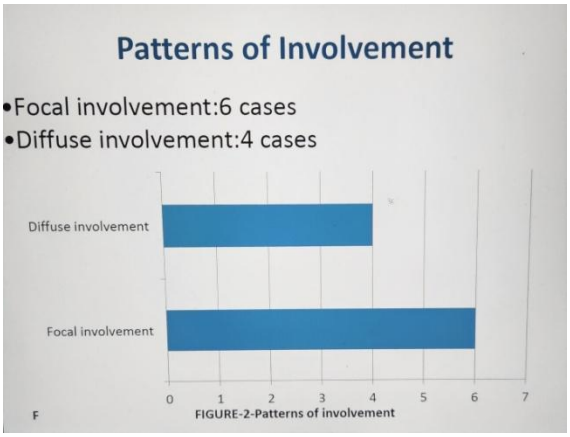

FIGURE-2-Patterns of involvement

Volume 6, Issue 1; January-February 2023; Page No 497-504

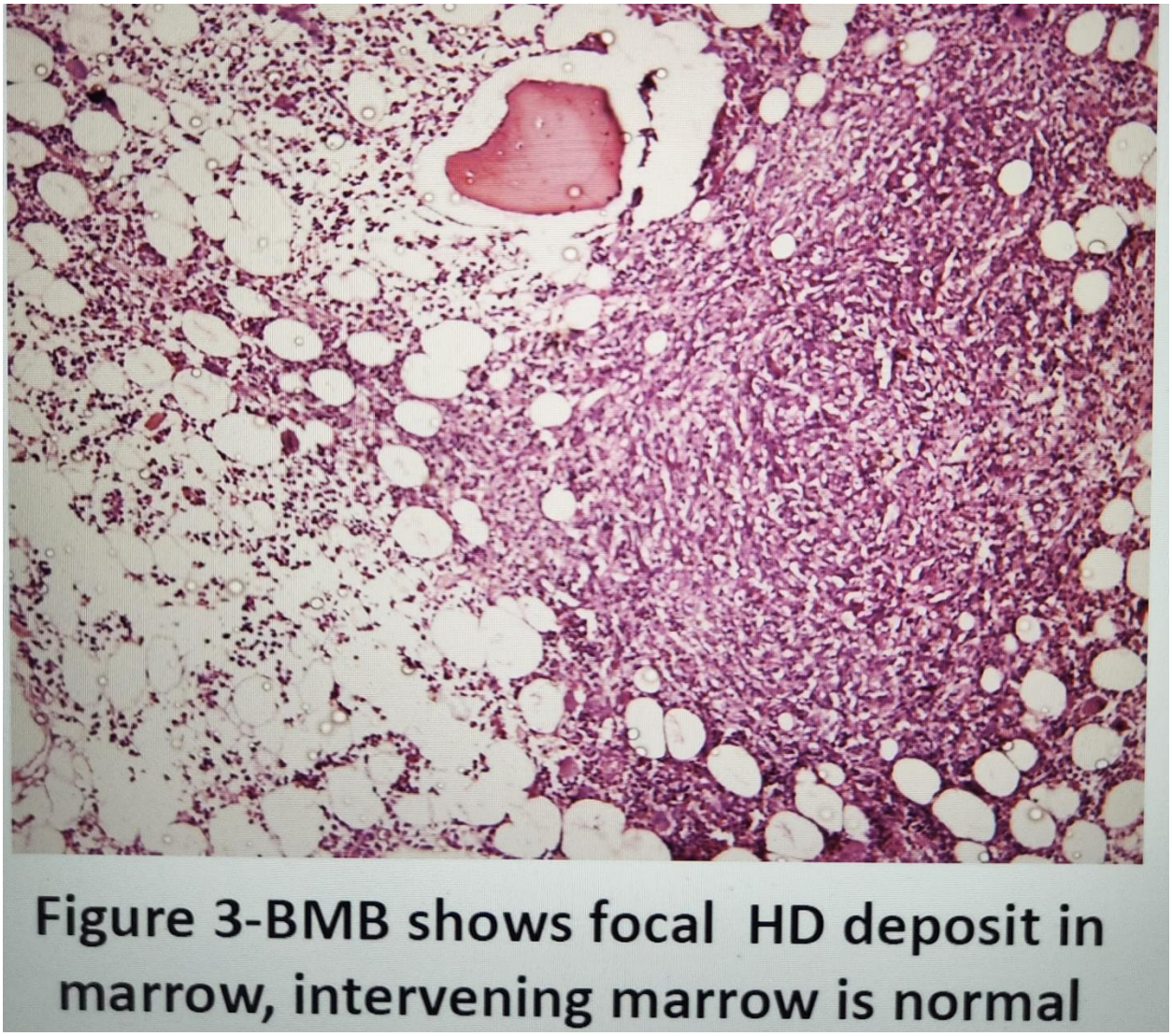

Figure 3-BMB shows focal HD deposit in marrow, intervening marrow is normal

Volume 6, Issue 1; January-February 2023; Page No 497-504

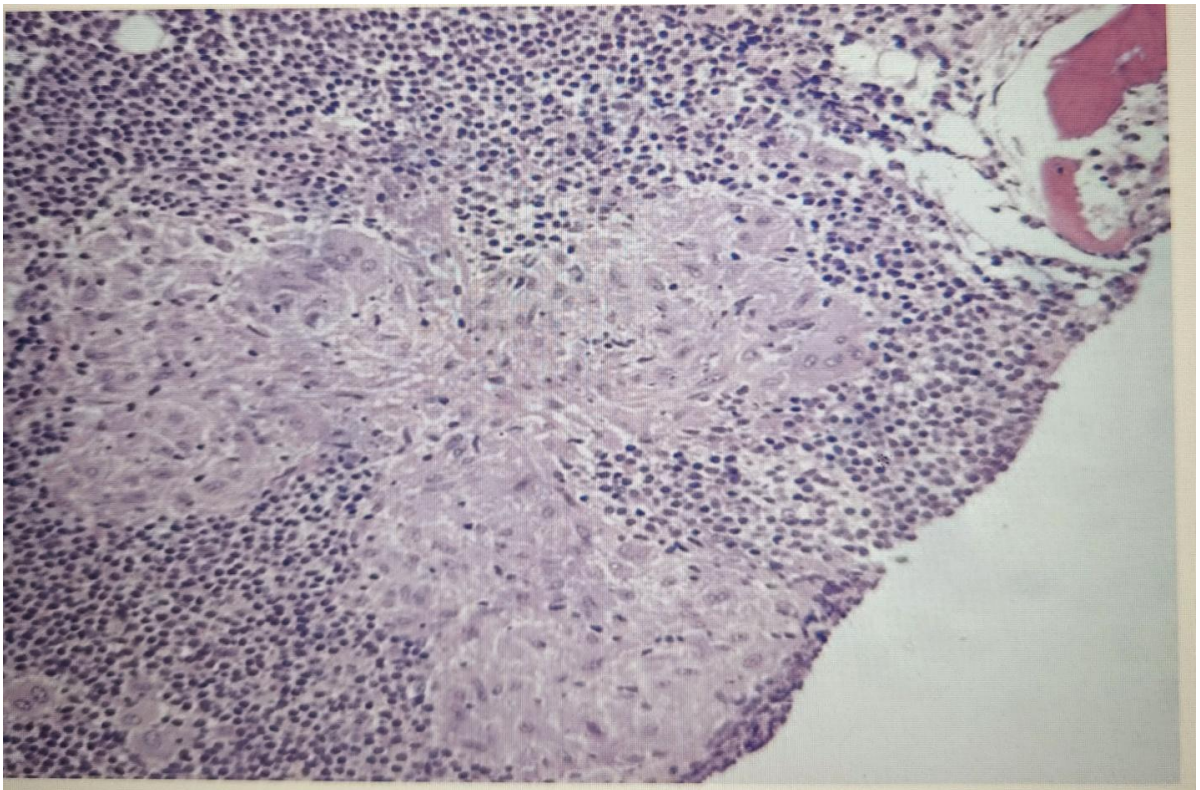

Figure 6-BMB showing granuloma in a patient of HD

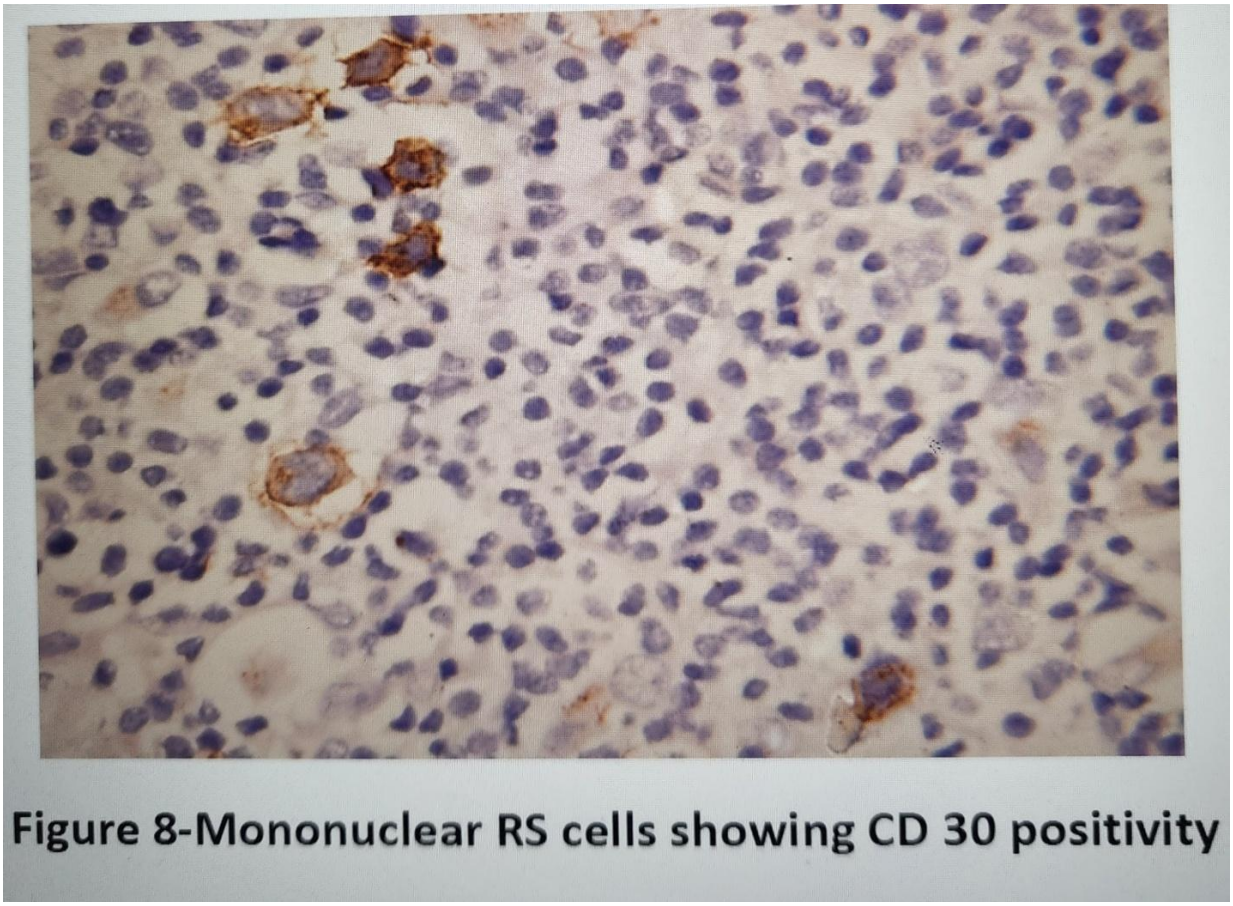

Figure 8-Mononuclear RS cells showing CD 30 positivity

Volume 6, Issue 1; January-February 2023; Page No 497-504

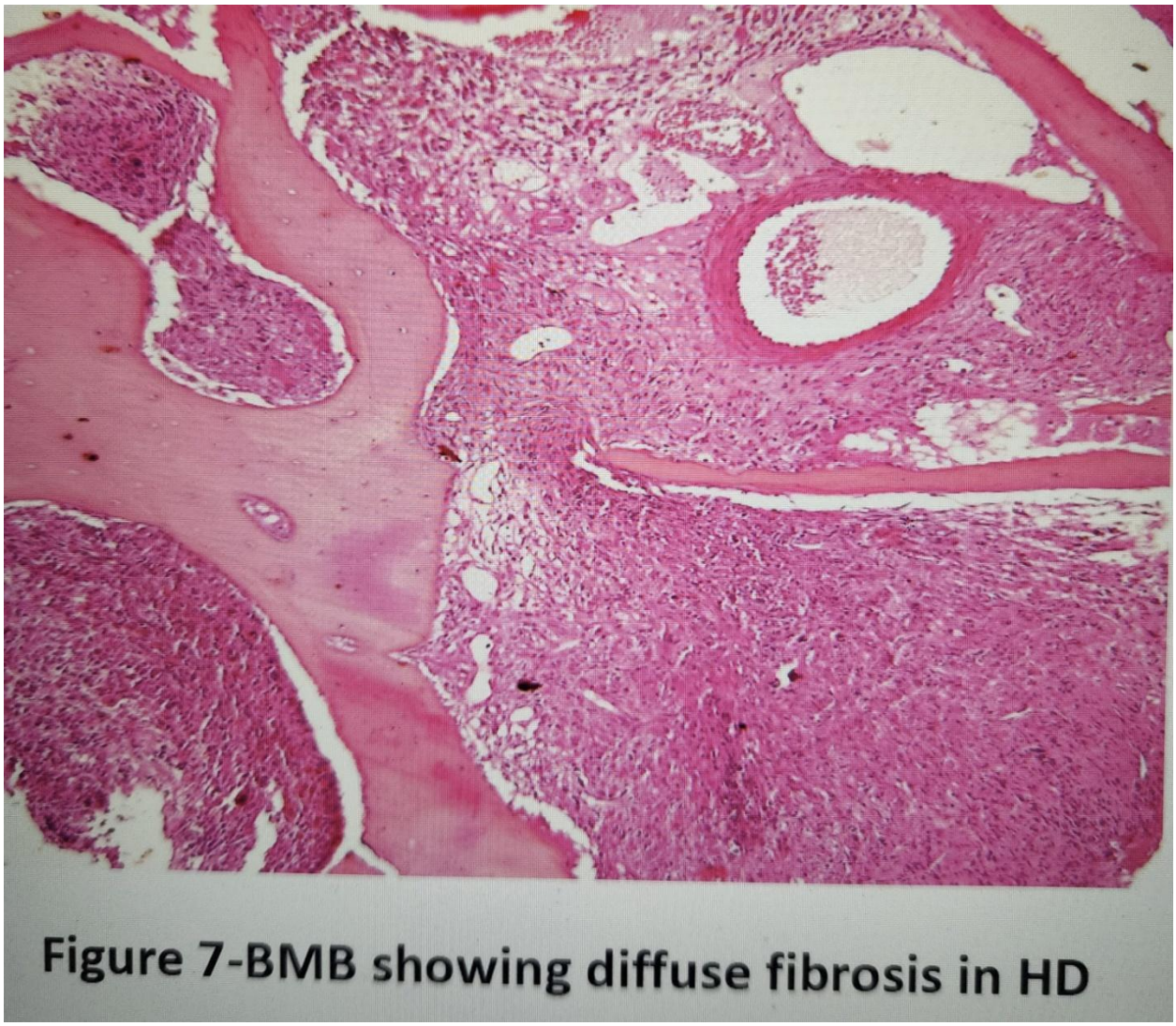

Figure 7-BMB showing diffuse fibrosis in HD

Volume 6, Issue 1; January-February 2023; Page No 497-504

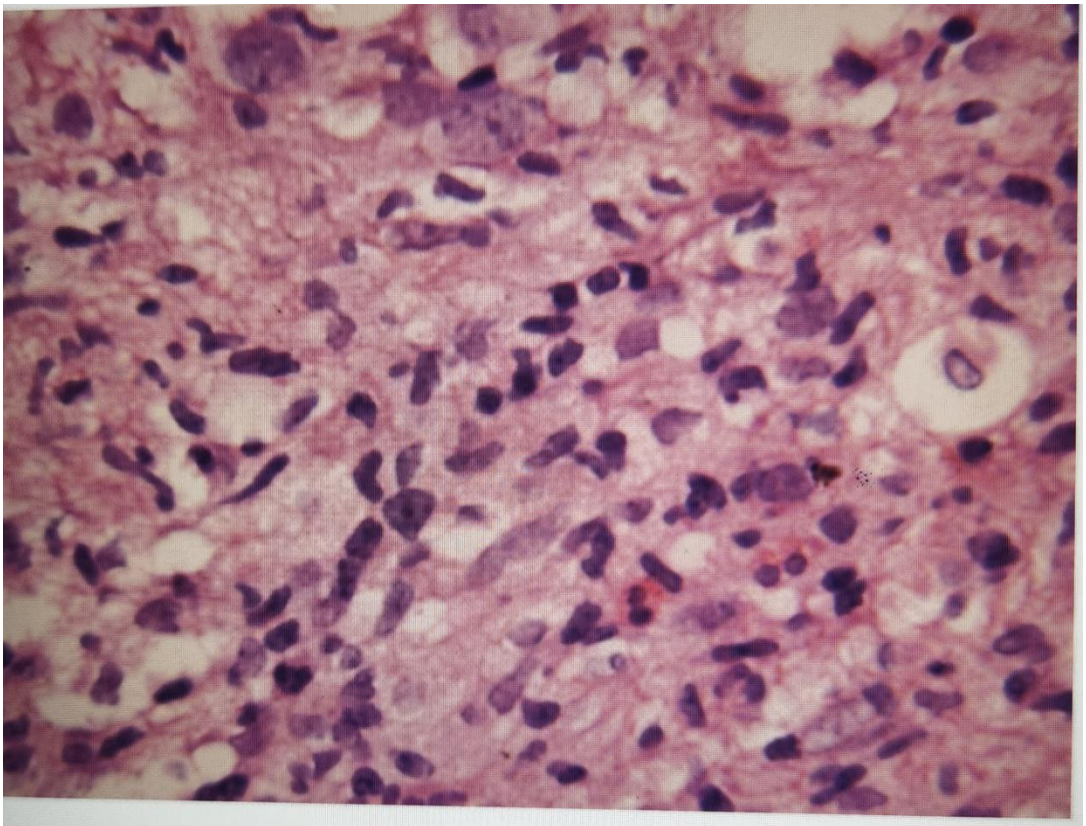

Figure 4-BMB showing mononuclear cells in polymorphous background

Discussion

Incidence of infiltration of BM in HL varies in different studies. Subramanian et al[7] has reported infiltration in 18% cases out of a total of 76 cases.

Hamid et al [2]reported an incidence of 30% out of 50 cases. In a study of Pakistan by siddiqui et al[8] infiltration by HL in BM was seen to the range of 53.4%.In our study, we found BM infiltration in 28.6% of cases out of total of 35 cases which is in concordance with other studies. High incidence in Pakistan studies may have been due the fact that higher percentage of patients presented in late stages (III&IV) as concluded by siddiqui et al[8].

Study done by Khan et al[9] observed 10:1 male to female ratio. In studies done by Cheema et al[10] and Siddhiqi et al[8], this bias towards male child is explained by economic status and more importance given to male child. Our study also shows male preponderance which correlated with above mentioned studies.

Diagnosis of HL involvement in BM is very challenging and according to Ann Arbor (1977) conference, criteria for diagnosis on marrow differ if a tissue diagnosis has already been made (Kar R Dutta S[11]and Dholaria B et al[12]).When the tissue biopsy is already done, as was the cases in our study the criteria for diagnosis are less stringent. There should be atypical mononuclear cells in a polymorphous background .If only few atypical cells with fibrosis and inflammatory cells or necrosis is seen then it is suggestive, not diagnostic. In these cases, IHC is needed to confirm the diagnosis (Lukes et al[13]).We did CD30 (Fig-8) in all suspicious cases. Extra caution was taken during decalcification as it affects antigen retrieval (Vangla et al[3]) .we found polymorphous infiltrate of lymphocytes, eosinophils, plasma cells, neutrophils and histiocytes in all cases. Classical RS cell in only one case and mononuclear cell in seven cases.

Necrosis is more commonly seen in bone marrow in HL after initiation of therapy (Brunning RD et

Volume 6, Issue 1; January-February 2023; Page No 497-504

al[14]).However, three of our cases showed necrosis at the time of presentation.

Granulomas are noted in two of our cases. This corresponds to a large study by Pease GL[15] discussing granulomatous lesion in bone marrow biopsy in 150 cases in which he found six cases of HL.

Gelatinous marrow transformation or serous atrophy of bone marrow is a rare disorder which is mainly seen in immunocompromised patients. It is also seen in one of our cases, similar findings reported by Das et al[16].

It has been reported in literature and in a study done by shi et al[17] that bone marrow by HL involves fibrosis. This was corroborated by our study in which fibrosis was seen in all cases (Reticulin grade 3 to 4).

Infiltration in HL has a focal pattern which may be a cause for negative bone marrow aspiration. In our study also six had focal involvement and four had diffuse involvement. it has been studied by A.Voltin et al[1] that PET CT is more sensitive in detecting infiltration of BM by HL with sensitivity reaching upto 95%.But it has been advocated by Hammid S J et al[2] and Subramanian et al that in developing countries like India PET is not available everywhere, Hence, trephine biopsy is the main stay for staging HL.

Conclusion

- HD in marrow is associated with fibrosis & therefore is not aspirable
- Characteristic morphological features & IHC on BMB are useful in clenching the diagnosis[10]
- Bone marrow infiltration in clinical stage IA and IIA upstages them to stage IV. so, Bone marrow biopsy should be performed for prognostic significance , early implementation of therapy and better survival of patients.[11]

Contributor'sStatement

All authors have made substantial contributions to idea and design, acquisition of data, analysis and interpretation of findings.

References

1. A.Voltin, H.Goergen, C. Baues et al.Value of bone marrow biopsy in Hodgkin lymphoma patients staged by FDG PET: results from the German Hodgkin study group trialsHD16, HD17 and HD18.Annals of oncology 29:1926-1931, 2018.
2. A.Hamid, N.Jabbar, S.Naeem.significance of bone marrow biopsy in staging of Hodgkin's lymphoma. King Edward medical university, Lahore. Special edition annals vol 16 NO.1 jan-march 2010
3. N.Vangala,T R Paul, S G Uppin et al.Clinically undetected Hodgkin lymphoma diagnosed initially on bone marrow biopsy: A large retrospective observational study from a tertiary care centre.Nizams institute of medical sciences,hyderabad,Telangna,India.Indian Journal of Medical and paediatric oncology vol.42 No.6/2021.
4. Gaudio F, Pedote P, Niccoli Asabella A, et al. Bone involvement in Hodgkin's lymphoma: clinical features and outcome. Acta Haematol 2018;140(03):178–18
5. Howell SJ,Grey M, Chang J et al.The value of bone marrow examination in the staging of Hodgkin's Lymphoma.revie of 955 cases seen in regional centre.Br.J haematology 2002;119:408-11.
6. Kroft SH,Mckenna RW.bone marrow manifestation of Hodgkin's and non- Hodgkin's lymphomas and lymphoma –like disorders.in:DM knowles,ed.Neoplastic hematopathology,2nd edition philadelphia,PA:Lippincott,williams&wilkins,2001:1447-1504.
7. Subramanian R, Basu D, Badhe B, Dutta TK. Role of bone marrow trephine biopsy in the diagnosis of marrow involvement in Hodgkin's disease. Indian J Pathol Microbiol. 2007 Jul;50(3):640-3. PMID: 17883170.
8. Siddhiqi N, Ayub B,Badar F,Zaidi A.Hodgkins lymphoma in Pakistan:clinicopathological study of 85 cases at cancer centre in Lahore.Pacific J cancer Asian Perv 2006;7:6515
9. Khan HI,Abdullah A,Nisa S.Pattern of Hodgkin lymphoma in children.Pak paed J sep 2005;29(3):145-9.
10. Akram M,Cheema MH,Sana S and Aziz Z.Hodgkins disease:analysis of 75 patients.JCPSP 2001;11(11:702-705)
11. Kar R,Dutta S,Tyagi S.clinically unsuspected Hodgkin's Lymphoma diagnosed primarily from

Volume 6, Issue 1; January-February 2023; Page No 497-504

BM trephine biopsy:report of 6 cases.Indian J Pathol microbial 2008:51(02):186-189
12. Dholaria B,Alapat D,Arnaoutakis K.Primary Bone marrow Hodgkin Lymphoma in an HIV negative patient.Int J of Hematol2014:99(04):503-507
13. Lukes RJ.Criteria for involvement of lymph node,bone marrow,spleen and liver in Hodgkins disease.Cancer Res 1971;31(11):1755-1767.
14. Brunning RD. Bone marrow. *In*: Rosai and Ackerman's surgical pathology, vol 2, Mosby; 2004. p. 2094.
15. Pease GL. Granulomatous lesions in bone marrow. Blood 1956 August;11(8):720-34
16. Das S, Mishra P, Kar R, Basu D. Gelatinous marrow transformation: a series of 11 cases from a tertiary care centre in South India. Turk J Haematol. 2014 Jun; 31(2):175-9. Doi: 10.4274/Tjh.2012.0151. Epub 2014 Jun PMID: 25035676; PMCID: PMC4102046.
17. shi YF,Li XH, Song WW et al.involvement of bone marrow in lymphoma: pathological investigation in a single centre from northern india.int J Clin Exp Pathol 2015:8(06)7102-7111

Volume 6, Issue 1; January-February 2023; Page No 497-504