Case Report

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Bone Marrow Involvement In Hodgkin's Lymphoma: Case Report

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ABSTRACT

Hodgkin's lymphoma is a malignant lymphoid neoplasm showing specific neoplastic cells and background of reactive non-neoplastic cells. Classical Hodgkin's lymphoma involves germinal or post germinal center B-cells which are positive for CD15 and CD 30 immunophenotypically. Mixed cellularity classical Hodgkin's lymphoma occurs in old age and is mostly seen in males. Extra nodal involvement is rare. Bone marrow involvement is considered as stage IV disease and it has poor prognosis. Here we present a unique case of CHL mixed cellularity with bone marrow infiltration showing three different patterns of infiltration.

Key words: Hodgkin lymphoma, Reed-Sternberg cells, bone marrow biopsy

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Introduction

Lymphomas are the tumors of lymphoid tissue. There are two main groups of lymphomas. One is Hodgkin's lymphoma (HL) and other one is non-Hodgkin's lymphoma (NHL).[1] HL is of B-cell origin. It is characterized by Reed-Sternberg cells (RS) and an inflammatory background.[2] 2008 classification of WHO classifies HL into nodular lymphocyte predominant Hodgkin lymphoma (NLPHL) or classical Hodgkin lymphoma (CHL). Both these subtypes of HL vary in the clinical presentation as well as in cellular properties. They have difference in morphology, immunophenotyping and presence or absence of B-cell gene expression. 95% of all HL is the CHL. Four histological subtypes of CHL have been identified. Lymphocyte-rich (LR), nodular sclerosis (NS), mixed cellularity (MC) or lymphocyte-depleted (LD).[3] Mixed cellularity HL is more common in the developing countries and in patients with HIV.[2] In HL lymph nodes are involved mainly but extranodal involvement may also occur. HL may involve any organ system like liver, lungs, bone marrow e.t.c.[4]

Involvement of bone marrow means there is hematogenous spread of disease as bone marrow does not have any lymphatics.[5] Involvement of bone marrow in CHL is rare. It is seen only in 5% to 10% of cases.[6] When bone marrow is involved in HL then it is considered as Ann Arbor stage IV disease. Stage IV HL has poor prognosis.[7]

Case Report

Sixty years old female presented with fever, weight loss and enlargement of inguinal lymphnodes. On blood complete examination she had neutrophilic leukocytosis (absolute neutrophil count :11,7300/mm^3 and lymphopenia (lymphocytes <8% of total leukocyte count. She had anemia with hemoglobin of 10g/dl. Histology of excise lymph node showed classical Hodgkin's lymphoma, mixed cellularity type. When her bone marrow biopsy was done, it showed hypercellular bone marrow aspirate with myeloid hyperplasia (Figure 1).

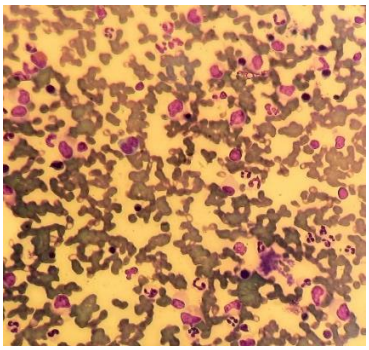

Figure 1. Bone marrow aspirate showing Reed-Sternberg cells. (10X, Wright Giemsa Stain)

Histiocytes and plasma cells were prominent in the bone marrow aspirate and there was marked hemophagocytosis. Reed Sternberg cells with

characteristic owl eye appearance and prominent nucleoli were observed on bone marrow aspirate (Figure 2). Bone marrow trephine showed three different patterns of bone marrow involvement. One pattern showed cellular area with presence of Reed stern berg cells and reactive background with plasma cells and eosinophils. One intertrabacular region showed grade ¾ fibrosis with Reed Sternberg cells. Reticulin in this region was also of grade ¾. Other intertrabacular region showed serous degeneration (necrosis) (Figure 3). So, this was a unique case of Hodgkin lymphoma with involvement of bone marrow showing three different patterns of involvement.

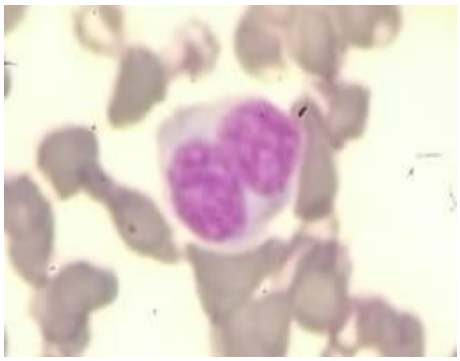

Figure 2. Reed-Sternberg cell (100X, Wright Giemsa Stain).

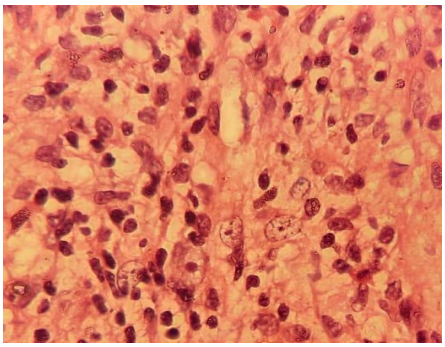

Figure 3. Bone marrow trephine showing infiltration by lymphoma cells and serous degeneration. (100X, Wright Giemsa Stain)

Discussion

Classical Hodgkin lymphoma (CHL) is more common than nodular lymphocyte predominant Hodgkin lymphoma (NLPHL). Among the subtypes of CHL, mixed cellularity classical Hodgkin lymphoma (MCCHL) is the most common type in developing countries.[8] MCCHL occurs more frequently in patients with Epstein–Barr virus infection and in those with HIV.[2]

Enlargement of lymph nodes is the most common early sign of CHL. The cervical, axillary, mediastinal, and supraclavicular lymph nodes are involved in most cases. There is some variation in the preferred sites of lymph node involvement among the different subtypes. MCCHL usually presents with enlargement of peripheral lymph nodes, while mediastinal involvement is uncommon in this subtype.[9]

In MCCHL the architecture of involved lymphnode is wiped out. It is called mixed cellularity due to its background which shows mixture of different inflammatory cells. Lymphocytes, plasma cells, eosinophils, neutrophils and histiocytes can be seen in the background of Reed-Strernberg cells and large mononuclear Hodgkin cells. Reed-Sternberg cell seen in MCCHL is of classical type. It is large cell which is binucleated or multinucleated. It has large eosinophilic nucleoli and cytoplasm is abundant.[10] When HL is diagnosed, staging is done for treatment and to assess prognosis. This is done by history, physical examination, blood complete, blood chemistry, x-rays and bone marrow examination.[5] For staging of lymphoma patient assessment of bone marrow is an important initial step. Sufficient bone marrow trephine biopsy is needed to check for infiltration by lymphoma. Normally trephine specimen of 1-2 cm in length is needed for the assessment.[8] Various studies have shown that involvement of bone marrow is more common in lymphocyte depleted and mixed cellulaity subtype. So these subtypes have more risk of having Ann Arbor stage IV and thus poor prognosis. Just like lymphnode bone marrow also shows classical Reed-Sternberg cells with an inflammatory background of lymphocytes, histiocytes and granulocytes.[10] Pattern of bone marrow involvement is mostly diffuse but it can be focal as well. Focal involvement can be random or para trabecular. These leisons are very cellular with abundant inflammatory cells and Reed-sternberg cells. In case of diffuse infiltration of bone marrow four different patterns can be observed. Most of cases show hypercellular marrow with mixture of cellular infiltrate. Another pattern shows hypercellular bone marrow with abundant Reed-Sternberg cells and few inflammatory cells. Third pattern shows dense fibrous tissue with few macrophages and lymphocytes. Fourth pattern may show hypocelluar bone marrow with loose connectvive tissue having inflammatory and neoplastic cells. There is increase in reticulin and collagen in the marrow.[11]

Conclusion

This case underscores the lethal nature of Thanatophoric Dysplasia (TD) and the critical role of early prenatal screening, especially in low-resource settings. The

diagnosis, confirmed by classic radiological features (micromelia, macrocephaly, and "telephone receiver" femurs), was delayed due to lack of antenatal care. Despite intervention, respiratory failure led to neonatal death, highlighting TD's poor prognosis. Advanced paternal age may be a risk factor. Improved access to prenatal ultrasound and genetic counseling is essential for timely diagnosis and family guidance.

References

1. Sultan S, Irfan SM, Parveen S, Ali S,Clinico-Hematological Findings for Classical Hodgkin's Lymphoma: an Institutional Experience.Asian Pac J Cancer Prev. 2016;17(8):4009-11. 10.14456/apjcp.2016.206/APJCP.2016.17.8.4009
2. Shanbhag S, Ambinder R. Hodgkin Lymphoma: a review and update on recent progress.CA Cancer J Clin. 2018 ;68(2):116-132. https://doi.org/10.3322%2Fcaac.21438.
3. Salati M ,Cesaretti M, Macchia M, Mistiri ME , Federico M. Epidemiological Overview of Hodgkin Lymphoma across the Mediterranean Basin. Mediterr J Hematol Infect Dis. 2014;6(1):e2014048. doi: 10.4084/MJHID.2014.048.
4. Mohammedzaki LB, Hasan KM, Polus RK ,YassinAK. Clinicopathological, immunohistochemical charachtaristic and the outcome of Hodghkin lymphoma patients in Erbil city, Iraq. Iraqi J Hematol 2019;8:14-20.doi. 10.4103/ijh.ijh_18_18.
5. Kar R, Dutta S, Tyagi S. Clinically unsuspected Hodgkin's lymphoma diagnosed primarily from bone marrow trephine biopsy: Report of six cases. Indian J Pathol Microbiol. 2008;51(2):186-9. https://doi.org/10.4103/0377-4929.41675.
6. Park Y, ParkBB, Jeong JY, KimWY, Jang S , Shin BK et al. Assessment of bone marrow involvement in patients with lymphoma: report on a consensus meeting of the Korean Society of Hematology Lymphoma Working Party.Korean J Intern Med. 2016;31(6):1030-1041. https://doi.org/10.3904/kjim.2015.006.
7. Mjali A, Abbas SK, Alwan AF, Hamzah SK.Clinical & Pathological Pattern of Hodgkin Lymphoma in Middle Euphrates Region of Iraq . Karbala J. Med. Vol.13, No.2, Dec, 2020.
8. Amshahar HA, Shah MS. Histopathological & Immunophenotypic Features in the Diagnosis of Hodgkin's Lymphoma: A review and Update. J. Glob. Sci. Res. 2020;9:814-33.
9. Wang HW, Balakrishna JP, Pittaluga S , Jaffe ES. Diagnosis of Hodgkin lymphoma in the modern era. Br J Haematol. 2019;184(1):45-59. https://doi.org/10.1111/bjh.15614.
10. Xing, Wei MD, Mai, Nicholas, Dresser, Karen et al. PD-L1 Immunohistochemistry Highlights Bone Marrow Involvement by Classic Hodgkin Lymphoma in Staging Biopsies: Implications for Diagnosis and Tumor Microenvironment Alterations. Appl Immunohistochemistry and Molecular Morphology. 2019;27(5):356-363. https://doi.org/10.1097/pai.0000000000000628.
11. Bone marrow pathology. Bain BJ, Clark DM , Wilkins BS. 4th edition.