

Case report:**Primary Skeletal Muscle Diffuse Large B Cell Lymphoma in Lumbar Region – A Rare Occurrence**

*Aparna Muralidhar¹, Kanna Sandhyarani Mahadev¹, Jessica Minal¹, Vidhya Venkatesan¹,
Vijaya V Mysorekar¹*

Abstract

Diffuse large B cell lymphoma (DLBCL) is the most common type of non-Hodgkin lymphoma worldwide. Patients most often present with a rapidly growing tumour mass in single or multiple, nodal, or extranodal sites. Extranodal involvement is seen in up to 40% cases. Initial presentation as soft tissue lesion is rare. We report a case of extranodal DLBCL in an elderly male, presenting as a soft tissue mass in the left lumbar region, clinically suggestive of lipoma. The patient had no palpable lymphadenopathy. Complete blood counts were within normal limits. Initial ultrasonography was suggestive of abscess, possibly of tubercular origin. On fine needle aspiration cytology, features were of a malignant neoplasm; a lymphomatous process. Subsequent histopathological evaluation followed by IHC confirmed the diagnosis of DLBCL. Primary extranodal DLBCL involving the soft tissue is rare. Owing to its non-specific and unusual clinical presentation, accurate diagnosis may be delayed. Besides, imaging modalities are also diagnostically challenging due to a wide range of differentials, thereby emphasising the need for tissue diagnosis. Histopathological examination and immunohistochemistry are paramount in accurate diagnosis and tailoring treatment options.

Keywords: DLBCL, extranodal, cytology, histopathology, immunohistochemistry

*International Journal of Human and Health Sciences Vol. 08 No. 01 January'24
DOI: <http://dx.doi.org/10.31344/ijhhs.v8i1.627>*

Introduction

Diffuse large B cell lymphoma (DLBCL) is an aggressive, rapidly growing neoplasm composed of medium or large B lymphoid cells, with a diffuse growth pattern. Morphological, biological, and clinical studies have subdivided DLBCLs into variants, molecular subtypes, and distinct disease entities. Cases with no clear and accepted criteria for subdivision are classified as DLBCL NOS, which is further subdivided into germinal centre B-cell (GCB) subtype and activated B-cell (ABC) subtype.¹ The disease occurs over a wide age range, with slight male predominance. Patients may present with nodal or extranodal disease. Up to 40% of cases initially present with extranodal

involvement. Gastrointestinal tract is the most common extranodal site to be involved. Other sites include the bone, testes, spleen, Waldeyer ring, salivary glands, thyroid, liver, kidneys, and adrenal glands.¹ Lymphoma involving skeletal muscle is rare and accounts for only 5% cases.² DLBCL usually proves fatal if untreated, but it is potentially curable with treatment. The standard of care for treatment is R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone).³

Here, we report a case of incidentally detected extranodal DLBCL presenting at an unusual site (lumbar region) in an adult.

1. Department of Pathology, Dr. Chandramma Dayananda Sagar Institute of Medical Education and Research, Dayananda Sagar University, Karnataka, India-562112.

Correspondence to: Dr. Jessica Minal, Associate Professor, Department of Pathology, Dr. Chandramma Dayananda Sagar Institute of Medical Education and Research, Dayananda Sagar University, Karnataka, India-562112. Email: jes.minal@gmail.com

Case Report

A 68-year-old male presented with a painless swelling in the left lumbar region of two months duration, gradually increasing in size. There was no history of trauma/weight loss/fever. On examination, the swelling was 7cm×6cm×2cm in size, firm, non-tender, not fixed to overlying skin. The patient had undergone an abdominal ultrasound at another centre which was reported as abscess; possibly of tubercular aetiology. Rest of the general physical examination and systemic examination were unremarkable. The complete blood count was within normal limits. A provisional clinical diagnosis of lipoma was made, and fine needle aspiration cytology (FNAC) was advised. FNAC revealed highly cellular smears composed of singly scattered large atypical cells with high N-C ratio, irregular nuclear membrane, vesicular nuclei, and prominent nucleoli. Few binucleate and multinucleate forms, plasmacytoid cells, bizarre forms and mitotic figures were noted in a haemorrhagic background with prominent lymphoglandular bodies (Figure 1).

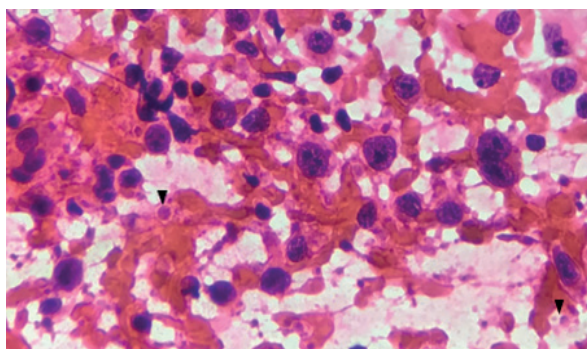


Figure 1: FNAC aspirate showing singly scattered large atypical cells with few binucleate forms and plasmacytoid cells in a haemorrhagic background with lymphoglandular bodies (arrow head) (H&E ×400)

Considering the cytomorphological features, a diagnosis of malignancy, possibly lymphoma was given. However, in view of the site of involvement, poorly differentiated sarcoma could not be ruled out and an excision biopsy was advised.

Then, an excision biopsy was performed, and the resected specimen was sent for histopathological examination. Grossly, the mass measured 7cm×3.7cm×3cm with a tan, firm, nodular appearance abutting all the resection margins. Skeletal muscle was noted on the posterior surface. (Figure 2). The microscopy showed sheets, nests and singly scattered cells with morphology as

described above. Skeletal muscle bundles at the periphery and the circumferential margins showed infiltration by tumour. (Figure 3).

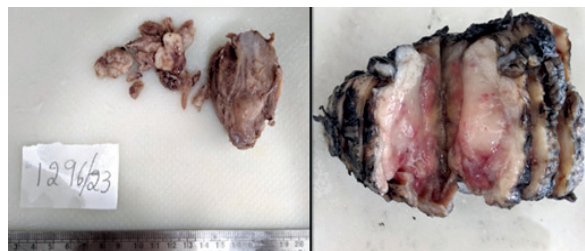


Figure 2: Tan, firm, nodular mass abutting all the resection margins. Skeletal muscle noted on the posterior surface.

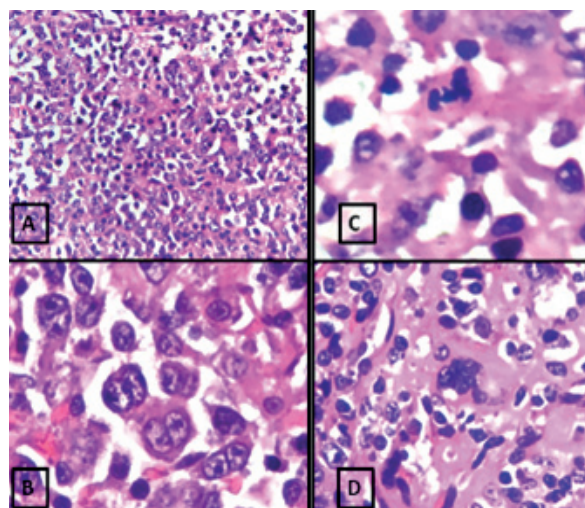


Figure 3: A) Atypical cells in sheets, nests and singly scattered cells with morphology as seen in cytology smears (H&E, ×100); B) Binucleate forms (H&E, ×400); C) Atypical mitotic figures (H&E, ×400); and D) Bizarre forms (H&E, ×400).

Immunohistochemistry was carried out to rule out a possibility of sarcoma (rhabdomyosarcoma) and confirm the diagnosis and subtype of non-Hodgkin lymphoma. Tumour cells were positive for LCA, CD20, BCL2 and MUM1. Ki 67 labelling index was 70% (Figure 4). They were negative for CD10, BCL6, C-MYC, CD3, CD5, CD30, CD138, ALK, EMA and Desmin. The final impression of DLBCL, activated B cell subtype was inferred. PET CT did not reveal any other site of involvement elsewhere in the body. Hence, a conclusion of primary skeletal muscle DLBCL in the lumbar region was made.

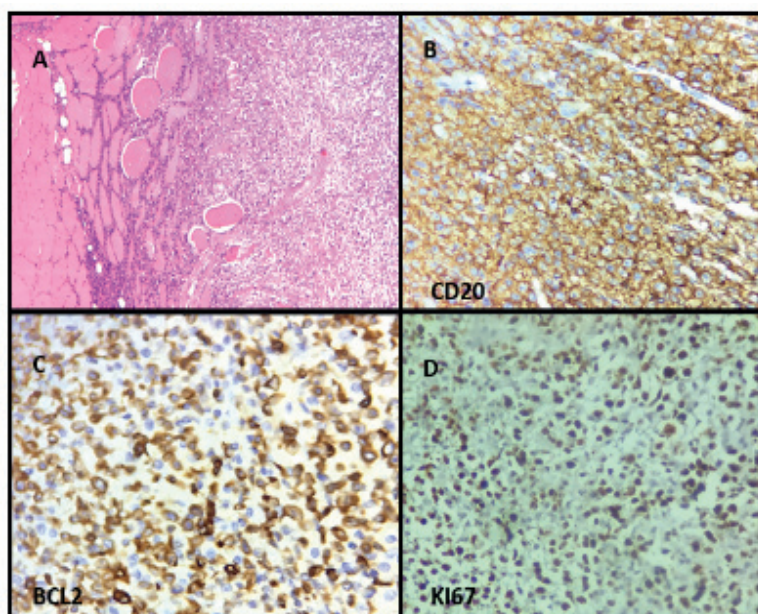


Figure 4: A) Skeletal muscle infiltration by tumor cells (H&E, ×40); B) membranous CD20 positive tumour cells; C) cytoplasmic BCL2 positive tumour cells; and D) nuclear Ki67 positive tumour cells (IHC, ×400)

Discussion

Diffuse large B cell lymphoma (DLBCL) is a heterogeneous category of lymphomas composed of large transformed B cells. DLBCL not otherwise specified (NOS), represents 80-85% of all cases.⁴ It is heterogeneous in terms of clinical presentation, genetic findings, response to therapy, and prognosis. Based on gene expression profiling, DLBCL NOS is subdivided into germinal centre B cell (GCB) subtype and activated B cell subtype. About 10-15% of cases are unclassifiable. Patients with the GCB subtype usually have better prognosis than those with the ABC subtype. Among the 40% cases presenting as extranodal lesions, soft tissue involvement has been reported in only 5% cases.²

Lymphoma occurring within the musculoskeletal system may occur as part of disseminated lymphoma, local extension from bone or rarely primary skeletal muscle lymphoma (PML).⁵ PML is exceedingly rare, accounting for less than 1% cases. The pathogenesis of PML is uncertain. One hypothesis is that skeletal muscle lymphoma can originate in aberrant lymph nodes within muscles. Some authors propose lymphomatous micro infiltrate originating from the adjacent bone as possible cause.⁶ In our case, the first hypothesis seems more likely as the FNAC smears

showed many lymphoglandular bodies (considered specific for lymphoid tissues and lymphoid malignancies). PML have been associated with a worse prognosis.^{5,7}

Cases of lymphoma involving skeletal muscle present with muscle pain, swelling and a rapidly enlarging mass. The commonly affected muscles are those of the extremities.⁷ On literature search, we came across very few cases of soft tissue DLBCL. All these were clinically suspected to be sarcomas and most cases involved the extremities.^{8,9,10} Uncommon sites include back, abdominal wall, pelvis and gluteal region.⁷ Our case is a primary skeletal muscle lymphoma presenting at the lumbar region of the back (which is an unusual site).

Skeletal muscle infiltration by lymphoma can mimic sarcoma, metastatic carcinoma, melanoma, and osteosarcoma causing diagnostic challenges. Morphologically, carcinomas have cohesive appearance, with nuclear moulding and streaming observed frequently. Lymphoma cells tend to be non-cohesive and exhibit a permeative quality.³ In contrast to sarcomas, lymphomas lack extracellular stroma and may present with confluent lymphadenopathy. However, IHC is essential for a confirmatory diagnosis.

The treatment of primary skeletal muscle lymphoma depends predominantly on the type of lymphoma. The prognosis of primary skeletal muscle lymphoma is poor in comparison to lymphoma confined to the lymphnodes.¹¹

The primordial treatment strategy for DLBCL is curative or palliative immunochemotherapy. The first-line treatment consists of R-CHOP; modifications should be considered in more challenging cases.¹¹ Studies have found positive BCL2 expression to be associated with poor prognosis, independent of international prognostic index and MYC expression.¹² In vitro studies have found BCL2 expressing cell lines to be sensitive to

venetoclax, (a highly selective BCL2 inhibitor).¹³

Conclusion

Primary skeletal muscle lymphoma is a rare entity and many of the cases belong to the group of diffuse large B cell lymphoma (DLBCL). Due to a broad differential diagnosis of muscle lesions on imaging, histological examination and immunohistochemistry play a pivotal role in the diagnosis, thereby guiding appropriate patient management. This case report attempts to create awareness to this unusual presentation of extranodal DLBCL and highlights the diagnostic

difficulties that can be present in these rare and often challenging cases often leading to delay in treatment.

Conflict of Interest: None declared.

Funding statement: Nil.

Authors' contribution: AM wrote the manuscript; KSM and VV helped to draft the manuscript; VVM and JM critically revised the manuscript. VVM and JM developed the idea of this case presentation. All the authors approved and submitted the manuscript.

References

1. Khoury JD, Solary E, Abal O, Akkari Y, Alaggio R, Apperley JF, et al. The 5th edition of the World Health Organization classification of haematolymphoid tumours: myeloid and histiocytic/dendritic neoplasms. *Leukemia*. 2022;36(7):1703-19.
2. Lee CH, Jeon SY, Yhim HY, Kwak JY. Disseminated soft tissue diffuse large B-cell lymphoma involving multiple abdominal wall muscles: a case report. *World J Clin Cases*. 2021;9(28):8557.
3. Fletcher CD. *Diagnostic histopathology of tumors*. New York: Elsevier; 2007.
4. Li S, Young KH, Medeiros LJ. Diffuse large B-cell lymphoma. *Pathology*. 2018;50(1):74-87.
5. Lim CY, Ong KO. Imaging of musculoskeletal lymphoma. *Cancer Imaging*. 2013;13(4):448-57.
6. Balogova S, Greksak R, Mizickova M, Noskovicova L, Babal P, Lukac L. Case report: skeletal muscle lymphoma as a result of slow centrifugal migration of untreated primary neurolymphomatosis? *Front Nucl Med*. 2022;2:804421.
7. Hatem J, Bogusz AM. An unusual case of extranodal diffuse large B-cell lymphoma infiltrating skeletal muscle: a case report and review of the literature. *Case Rep Pathol*. 2016;2016:9104839.
8. Siddiqui RS, Ferman D, Tuli S. Diffuse large B-cell lymphoma of the left upper extremity mimicking a sarcoma. *Cureus*. 2021;13(6):e15588.
9. Bolke E, Peiper M, Matuschek C, Schieren G, Glombick R, Förster C, et al. Extranodal diffuse non Hodgkin lymphoma in the thigh. *Eur J Med*. 2010;15(8):367-8.
10. Ansari SA, Agrawal T, Bhamra S. Diagnostic surprise on IHC: a rare case of intramuscular DLBCL in thigh region mimicking sarcoma. *IP Arch Cytol Histopathol Res*. 2022;7(3):205-7.
11. Zhang L, Lin Q, Zhang L, Dong L, Li Y. Primary skeletal muscle diffuse large B cell lymphoma: a case report and review of the literature. *Oncol Lett*. 2015;10(4):2156-60.
12. Roh J, Cho H, Yoon DH, Hong JY, Lee AN, Eom HS, et al. Quantitative analysis of tumor-specific BCL2 expression in DLBCL: refinement of prognostic relevance of BCL2. *Sci Rep*. 2020;10(1):10680.
13. Tsuyama N, Sakata S, Baba S, Mishima Y, Nishimura N, Ueda K, et al. BCL2 expression in DLBCL: reappraisal of immunohistochemistry with new criteria for therapeutic biomarker evaluation. *Blood*. 2017;130(4):489-500.