# B-cell Lymphoma Presenting as an Isolated Chest Wall Mass

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## Abstract:

Reports of primary diffuse large B-cell lymphomas of the chest wall are extremely rare in the English literature. We report a case of a 34-years old male, presented with left-sided back swelling. A magnetic resonance scan showed a solid mass in the posterior left side of the chest wall, involving the ninth and tenth ribs. The diagnosis of diffused large B-cell lymphoma (DLBCL) was determined upon the results of histological and immunochemical investigations. The patient received cycles of chemotherapy and further follow up was satisfying.



## Key Words:

- Diffuse large B-cell lymphoma, primary chest wall tumor, Non-Hodgkin's Lymphoma.

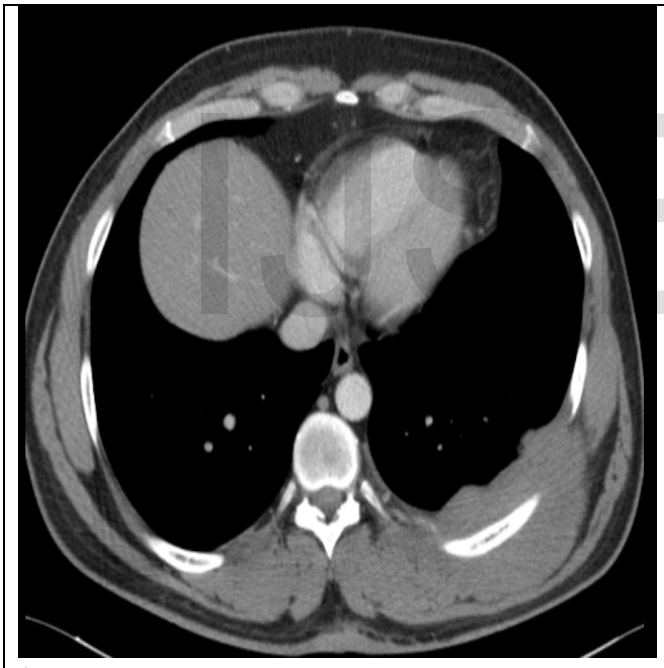
## Introduction:

Diffuse large B cell lymphoma is the most common type of non-Hodgkin's lymphomas, representing nearly one-third of all cases. Its incidence increases with age. The median age at presentation is 64 years [(1)]. Diffuse large B-cell lymphoma can present at extra nodal sites. Although any organ can be involved, it rarely involves the chest wall as a primary site and if it does, it is usually predisposed by a long-standing history of pyothorax or a chronic tuberculous empyema [(2)]. The clinical and radiological findings are not specific and excisional or incisional biopsies are needed for a definite pathologic diagnosis.

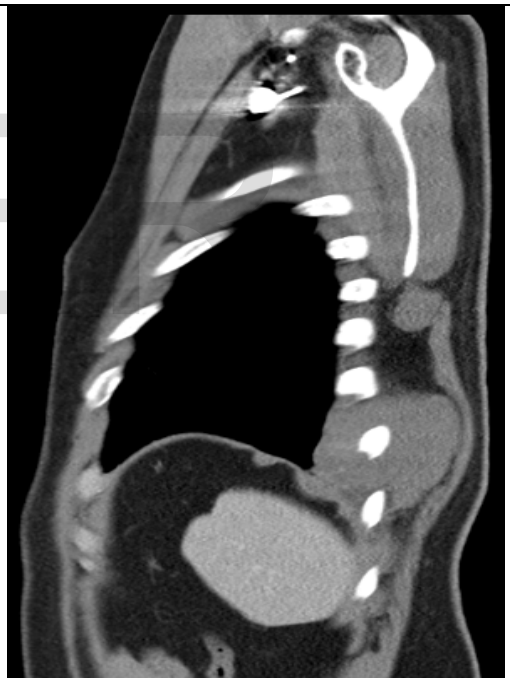
## Case report:

A 34 years old male, was referred to our clinic with a solitary and progressively increasing mass lesion in the left posterior side of his chest for 5 months duration. The patient is not known to have any medical illnesses and was in his usual state of health until 5 months ago, when he started to feel mild pain in the left side of his back. Three months later, the patient noticed a swelling at the same site of the pain and was progressively increasing in size and was associated with dyspnea in some occasions. The patient gave a positive history of a similar lesion 3 years back, which was approximately 3 cm in size and appeared in the middle of his back which was excised, and there was no pathology record for this lesion, since it was done in another institution. There was no history of weight loss, night sweats, fever, and loss

of appetite, skin rashes or pain in the joints. He also denied any previous family history of the same complaint or any history of trauma. The patient is a Hookah smoker since 8 years. Clinically, the mass lesion was oval in shape, hard in consistency, non-tender, fixed, about 15 × 10 $cm^2$, which was located at the left side of his back with no skin changes, sinuses or discharges. The lesion was sweeping medially to infiltrate the transverse spinous processes and the $9^{th}$ and $10^{th}$ ribs. Also, there were multiple erythematous skin lesions at the middle of the back, which suggests cutaneous vasculitis. Laboratory data on admission: White blood cells 7.2 × $10^9$ /L (4-11 ×$10^9$ /L), hemoglobin 14.9g/dL (13-18 g/dL), hematocrit 45% (40-54%) and platelets 307 ×$10^9$ /L. Liver function test (LFT) and renal function test (RFT) were within normal limits. His coagulation profile: PT 11.9s, PTT 30.5s and INR 1, was within normal limits. CRP 5.5 mg/dL (<10 mg/dL). CT chest (*Figure 1*) revealed a mass infiltrating the left $8^{th}$, $9^{th}$ and $10^{th}$ ribs posteriorly and infiltrating the pleural cavity as well as the back muscles. However, the underlying bones were normal, and the liver was average in size with no evidence of any focal hepatic lesions or contour irregularities. MRI showed the lesion infiltrating medially till the transverse spinous processes of D9 and D10. On the left side it was infiltrating the bone marrow and denoting its cortex. The maximum dimension of the lesion was measured to be 6 × 7 × 15 cm on Antero-posterior view.



*a*.



*b*.

*Figure 1*: Multiple planes CT scan of the chest in mediastinal and bone window, showing soft tissue mass involving the posterior chest wall which is infiltrating the back muscles posteriorly at the level of $8^{th}$ to $10^{th}$ ribs and causing thinning of the involved ribs with heterogeneous density.

Tru-cut biopsy was done and histopathological report confirmed the diagnosis of diffuse large B-cell lymphoma, which was positive for (BCL-6, CD10, CD20, and CD23), Ki-67 (proliferation index) was 80% and it was negative for (BCL-2, CD5, Cyclin D1, and TdT).

The case was discussed with tumor board and there were no neural tissue inclusions, no neurological deficits or any spinal instability. The tumor was surgically excised and the patient received full regimen of chemotherapy and made a satisfactory response.

## Discussion:

The chest wall, yet rare, is the origin for a wide variety of malignant neoplasms, which include primary neoplasm, adjacent neoplasm with local invasion, and metastatic lesions [3]. However, primary chest wall neoplasm is rare, representing only 5%. Among primary chest wall neoplasms, chest wall lymphoma is uncommon [4]. To date, only a few cases of primary malignant lymphoma arising from the pleura or the rib with no previous history of tuberculosis, pyothorax or artificial pneumothorax therapy have been reported. They are also strongly associated with the latent form of EBV. However, in 2013, Non-Hodgkin's Lymphoma caused death of 226 million globally, including 133 million males and 92 million females [5], which indicate that it is more common in males than in females. The incidence of lymphomas increases with age, with median age of 64 years with diffuse large B-cell lymphoma accounting for 31% [1]. Primary lymphoma of the chest wall is quite rare. In a patient series of 250 patients with lymphoma, only four had the disease in the chest wall; this included a single patient with non-Hodgkin's lymphoma [6]. Lymph-adenopathy, splenomegaly and cough are the most common presenting symptoms of non-Hodgkin's lymphoma. Other symptoms include night sweats, unexplained fever and weight loss. A study of 157 patients with initial presentation of isolated chest wall mass and non-Hodgkin's lymphoma was diagnosed in seven of them. There were one female and sex male patients with a mean age of 66.5 years. The mean largest diameter of the mass was 10.3 cm. Four of these seven patients had the chest wall lymphoma as the only site of the disease. The pathologic diagnoses were malignant lymphoma in two patients and diffuse large B-cell lymphoma in five patients [3]. The chest wall lymphoma occurs in association with a previous history of pyothorax and therapeutic pneumothorax for tuberculosis pleuritis as reported in a study of two similar cases, which were positive for CD45, B-cell markers (CD20, CD79a, and CD45RA), bcl-2 oncogene product, EBNA-2 and, partially, LMP-1 as well as the neoplastic cells of the EBV related small RNAs EBER 1[7]. There are few reported cases of DLBCL which occur without a previous history of pyothorax, tuberculosis and therapeutic pneumothorax. One of them is a study of a 28-year-old man, who had no history of tuberculous pyothorax or artificial pneumothorax therapy but did have a 4-month history of dyspnea, fever, chills, and night sweats [4]. Another case of DLBCL was of an 80-year old woman with a history of fatigue, and a giant mass on the chest wall [1]. The 3rd reported case of DLBCL is a 62-year-old Chinese woman presented with intermittent left sided chest pain for six months. She had no personal history of trauma or surgery, and she had no family history of cancer [2]. For easier comparison, we've summarized those cases in Table 1. Our patient is an unusual patient when compared to the previously reported instances of chest-wall DLBCL. He is young, has no history of tuberculosis, pyothorax or chest-wall trauma that could be a cause of chronic inflammation. The single presenting symptom of our patient was a solitary mass lesion in the posterior side of the chest wall with skin lesion in the overlying skin. Diagnosis of Non-Hodgkin's Lymphoma is based on history, physical examination, laboratory investigations, imaging (CT/PET), tissue biopsies, and cell markers obtained from immunohistochemical, flow cytometric, and cytogenetic testing. However, Pathological evaluation remains the most specific and sensitive test for diagnosis but may be difficult in some complex cases. It is a curable condition by chemotherapy alongside surgical resection in some instances.

| Author | Age | Sex | Presentation | Size (cm) | Histopathology | Chemistry |
|---|---|---|---|---|---|---|
| Barutca S, etal. | 80 | F | Palpable mass, chest pain, fatigue, weight loss | 20×20 | Suggestive of DLBCL | CD45, CD30, CD79 |
| Qiu X, etal. | 62 | F | Intermittent chest pain | 7×7.5×15 | Pleomorphic large-cell proliferation | CD20, PAX-5, B-cell lymphoma 6 protein |
| Tabatabai | 28 | M | Palpable mass, | 10×10 | Diffuse infiltration of large | Leukocyte common |

| | | | | | | |
|---|---|---|---|---|---|---|
| A, etal. | | | dyspnea, fever, chills | | lymphocytes with vesicular and prominent nucleoli and relatively abundant cytoplasm | antigen, CD20, and Ki67 and negative for CD3, vimentin, desmin, Chromogranin, neuron specific enolase, CD99, and actin. |
| Tabatabai A, etal. | 42 | M | Intermittent chest pain | 5×5 | Diffuse infiltration of a large lymphocyte with vesicular and prominent nucleoli and relatively abundant cytoplasm | Leukocyte common antigen, CD20, Ki67 |
| Lau, etal. | 67 | M | Chronic pleural effusion | 7.4×7.6 | Suggestive of DLBCL | CD30 |
| S. Ascani, etal. | 70 | M | Supraclavicular mass, chest pain, asthenia, fever, weight loss, | - | Diffuse proliferation of large cells spreading in the subpleural space and thoracic wall, which was constantly thickened by fibrosis | Ig light chains, CD45, CD20, CD79a, CD45RA, bcl-2 oncogene product, EBNA-2, LMP-1 |
| S. Ascani, etal. | 75 | M | Mass, chest pain, dyspnea, mild fever, pleural effusion | 15 cm wide | Diffuse proliferation of large cells spreading in the subpleural space and thoracic wall, which was constantly thickened by fibrosis | Ig light chains, CD45, CD20, CD79a, CD45RA, bcl-2 oncogene product, EBNA-2, LMP-1 |

*Table 1: Clinical data of 6 patients with primary chest wall lymphoma*



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