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T-Cell–Rich B-Cell Lymphoma Presenting as Splenic-Dominant Disease Mimicking Malignancy of Unknown Origin: A Case Report

[1]Prashant Verma, Department of General Surgery, Bhagat Phool Singh Mahila Vishwavidyalaya, Sonipat, Haryana, India
[2]Pushpendra Malik, Department of General Surgery, BPSGMC Khanpur Kalan, 453/12 Vishnu Nagar, Gohana Haryana, India – 131301
[3]Ashu Swami, Department of General Surgery, Bhagat Phool Singh Mahila Vishwavidyalaya, Sonipat, Haryana, India
[4]Dev Vardhan Singh, Department of General Surgery, Bhagat Phool Singh Mahila Vishwavidyalaya, Sonipat, Haryana, India

Corresponding Author: Prashant Verma, Department of General Surgery, Bhagat Phool Singh Mahila Vishwavidyalaya, Sonipat, Haryana, India

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Abstract

T-cell–rich B-cell lymphoma (TCRBCL) is a rare variant of diffuse large B-cell lymphoma that often presents at an advanced stage and poses significant diagnostic challenges. We report a case of a 69-year-old male who presented with splenomegaly and multiple hypodense splenic lesions on contrast-enhanced computed tomography, along with borderline abdominal lymphadenopathy and gastric antral wall thickening, initially raising suspicion of malignancy of unknown origin. Upper gastrointestinal endoscopy was normal, and splenic biopsy was not feasible due to bleeding risk. Whole-body ^{18}F-FDG PET-CT revealed widespread FDG-avid nodal disease, splenic lesions, and extensive bone marrow involvement. Definitive diagnosis was established by excision biopsy of cervical lymphadenopathy, confirming T-cell–rich B-cell lymphoma. The patient was treated with standard R-CHOP chemotherapy and showed good clinical response. This case highlights the diagnostic dilemma of splenic-dominant disease and emphasizes the role of PET-CT and safe nodal biopsy in establishing the diagnosis.

Keywords: T-cell–rich B-cell lymphoma; splenomegaly; PET-CT; malignancy of unknown origin; R-CHOP

Introduction

The spleen is an uncommon site for dominant involvement in malignant disease, and focal or diffuse splenic lesions often raise suspicion of metastatic malignancy or malignancy of unknown origin. Although lymphomas frequently involve the spleen as part of disseminated disease, splenic-dominant presentation without an established diagnosis may pose a significant diagnostic dilemma. T-cell–rich B-cell lymphoma (TCRBCL) is a rare histological variant of diffuse large B-cell lymphoma, characterized by scattered malignant B cells in a background rich in reactive T lymphocytes.

Patients often present with advanced-stage disease and extranodal involvement. We present a case of TCRBCL initially masquerading as splenic-dominant malignancy of unknown origin, highlighting the diagnostic challenges and the role of PET-CT and nodal biopsy.

Case Presentation

A 69-year-old male presented with constitutional symptoms and abdominal discomfort. There was no history of gastrointestinal bleeding, fever, or prior malignancy. Clinical examination revealed splenomegaly without palpable peripheral lymphadenopathy. Other systemic examination findings were unremarkable.

Investigations

Baseline laboratory investigations were within acceptable limits. Tumor markers were not contributory. Contrast-enhanced computed tomography (CECT) of the abdomen revealed moderate splenomegaly (span approximately 162 mm) with multiple ill-defined hypodense lesions diffusely involving the splenic parenchyma, the largest measuring approximately 35 × 35 mm. Nodular heterogeneously enhancing wall thickening was noted in the antrum of the stomach (maximum thickness approximately 10 mm), along with multiple rounded periportal and peripancreatic lymph nodes, the largest measuring 15 × 14 mm. Upper gastrointestinal endoscopy did not reveal any mucosal abnormality.

Percutaneous splenic biopsy was considered but deferred due to the high risk of bleeding and splenic rupture. The patient was kept under close follow-up.

Whole-body ^{18}F-FDG PET-CT demonstrated hypermetabolic lymphadenopathy involving bilateral cervical (levels II–IV and supraclavicular), mediastinal, abdominal, pelvic, and inguinal regions. FDG-avid splenic lesions were noted, with the largest measuring approximately 3.5 × 3.4 cm and SUVmax up to 14.8. Extensive FDG uptake was seen in the axial and appendicular bone marrow. No FDG-avid gastric lesion was identified. The imaging findings favored lymphoma over malignancy of unknown origin.[5,6]

Histopathology and Management

During follow-up, the patient developed cervical lymphadenopathy. Excision biopsy of a cervical lymph node revealed effacement of nodal architecture by scattered large atypical B cells in a background rich in reactive T lymphocytes. Immunohistochemistry showed tumor cells positive for CD20 and CD79a and negative for T-cell markers, consistent with T-cell–rich B-cell lymphoma, a variant of diffuse large B-cell lymphoma. Based on PET-CT findings, the disease was staged as Ann Arbor stage IV.

The patient was referred to medical oncology and initiated on standard immunochemotherapy with the R-CHOP regimen. On follow-up, the patient showed good clinical response with improvement in symptoms and general condition.

Discussion

Splenic-dominant involvement in malignant disease represents a significant diagnostic challenge, particularly when it constitutes the initial or predominant radiological abnormality. The spleen is an uncommon site for primary solid tumors and is relatively resistant to metastatic deposits because of its unique anatomical, hemodynamic, and immunological characteristics, including sharp angulation of the splenic artery, rhythmic contractility, absence of afferent lymphatics, and rich reticuloendothelial activity.[1] Consequently, diffuse or multifocal splenic lesions often raise suspicion of metastatic disease or malignancy of unknown origin rather than hematolymphoid malignancy.

In the present case, CECT findings of splenomegaly with multiple hypodense lesions and gastric antral wall thickening closely mimicked a gastrointestinal primary

malignancy with secondary splenic involvement. Normal upper gastrointestinal endoscopy, inconclusive fine-needle aspiration cytology, and the inability to safely perform splenic biopsy due to bleeding risk further prolonged diagnostic uncertainty. Such scenarios highlight the limitations of conventional imaging and invasive diagnostic approaches in splenic-dominant disease.

Whole-body ^{18}F-FDG PET-CT proved pivotal in resolving this diagnostic dilemma. The demonstration of widespread hypermetabolic lymphadenopathy along with FDG-avid splenic lesions and extensive bone marrow involvement strongly favored lymphoma over metastatic carcinoma.[5,6] Beyond diagnosis, PET-CT enabled accurate staging, detection of extranodal and marrow disease, and identification of a safe and accessible lymph node for excision biopsy.[6–8] These advantages underscore the central role of PET-CT in evaluating suspected malignancy of unknown origin, particularly when lymphoma is a diagnostic consideration.

T-cell–rich B-cell lymphoma is a rare histopathological variant of diffuse large B-cell lymphoma, accounting for approximately 1–3% of cases.[3] Histologically, it is characterized by scattered malignant B cells in a background rich in reactive T lymphocytes and histiocytes, which may lead to diagnostic difficulty, especially in small biopsy samples. Clinically, TCRBCL commonly presents with advanced-stage disease, frequent extranodal involvement, and bone marrow infiltration, features that were evident in the present case.[3,7]

From a surgical perspective, this case reinforces an important management principle: splenectomy should not be routinely employed for diagnostic purposes in splenic-dominant disease. Careful surveillance combined with advanced imaging may allow identification of peripheral lymphadenopathy suitable for biopsy, thereby avoiding unnecessary surgical morbidity.[5,6] Early diagnosis enabled timely initiation of R-CHOP chemotherapy, resulting in favorable clinical response.

Conclusion

T-cell–rich B-cell lymphoma may present as splenic-dominant disease and closely mimic malignancy of unknown origin. Comprehensive imaging, judicious use of PET-CT, and safe tissue diagnosis are essential to avoid unnecessary surgical intervention. Early recognition and appropriate systemic therapy can lead to favorable clinical outcomes.

Legend Figures

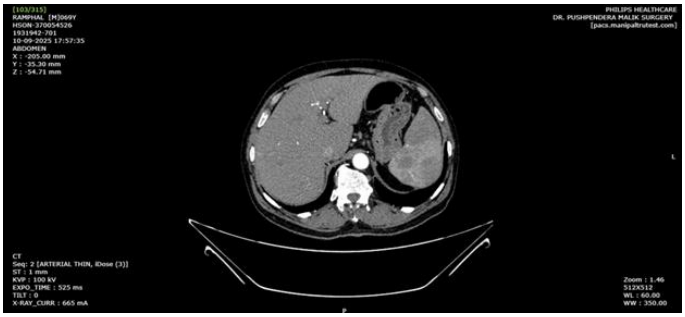

Figure 1: Contrast-enhanced computed tomography (CECT) of the abdomen showing moderate splenomegaly with multiple ill-defined hypodense lesions diffusely involving the splenic parenchyma (largest approximately 35 × 35 mm).

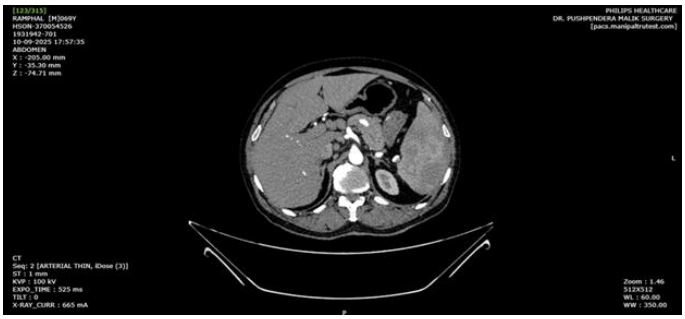

Figure 2: Contrast-enhanced computed tomography (CECT) demonstrating nodular heterogeneously enhancing wall thickening of the gastric antrum (maximum thickness approximately 10 mm) with associated periportal and peripancreatic lymph nodes.

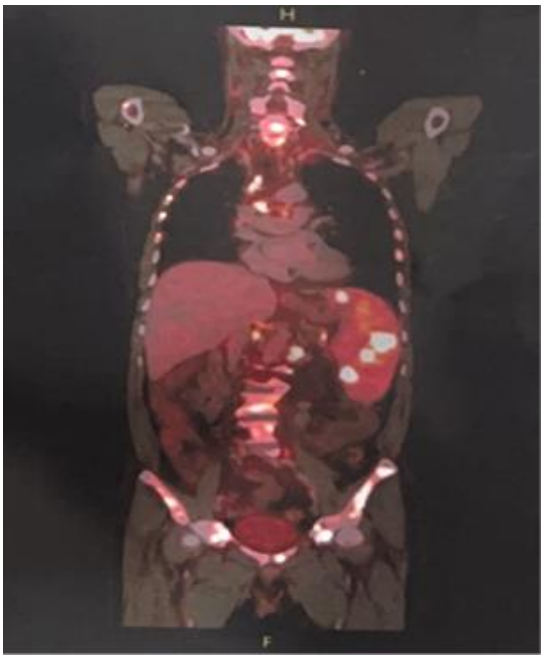

Figure 3: Whole-body 18F-FDG PET-CT maximum intensity projection image showing widespread hypermetabolic lymphadenopathy involving cervical, mediastinal, abdominal, pelvic, and inguinal nodal stations, along with intense FDG uptake in splenic lesions.

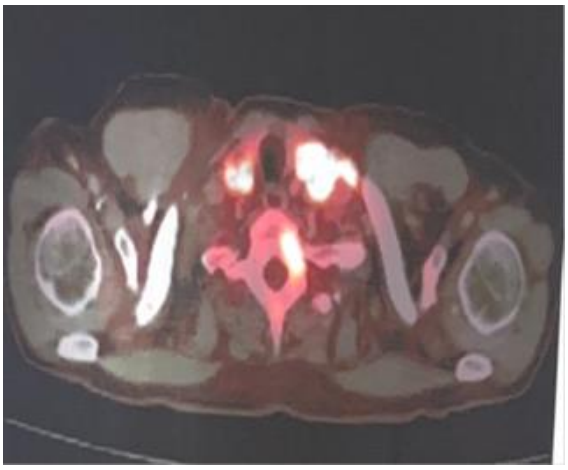

Figure 4: 18F-FDG PET-CT fused axial images demonstrating FDG-avid splenic lesions (SUVmax up to 14.8) and diffuse bone marrow uptake consistent with extensive marrow involvement.

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