Burkitt-like lymphoma with 11q aberration in a patient with chronic lymphocytic leukaemia: a potentially unrecognised association

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Pathological Society
Understanding Disease — Guiding Therapy

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Abstract

Chronic lymphocytic leukaemia (CLL) is a common leukaemia in adults with potential to progress to more aggressive forms. We report a case of a 68-year old male with a previous history of CLL, who presented with an obstructing caecal mass. Microscopy revealed high grade features resembling Burkitt lymphoma; however, no MYC rearrangement was detected and subsequent FISH studies detected 11q aberration. Although this profile is now a recognized entity in the revised 4th edition of the WHO classification of Tumours of Haematopoietic neoplasms as “Burkitt-like lymphoma with aberration in 11q”, this has not previously been reported in patients with previous or concurrent CLL. We discuss this case of possible transformation from CLL to Burkitt-like lymphoma with aberration in 11q.

Keywords 11q aberration; burkitt-like; chronic lymphocytic leukaemia

Case report

A 68-year old male with a known history of chronic lymphocytic leukaemia (CLL) was reviewed by haematology for new onset symptoms of night sweats and fatigue. Clinical examination was unremarkable. Investigations revealed an obstructing caecal mass which was resected and sent to the Haematological Malignancy Diagnostic Service (HMDS) for review.

Microscopic examination revealed features of a high-grade lymphoma with Burkitt-like morphology. There was effacement of the sections by sheets of atypical, medium to large germinal centre B-cells with a high proliferation index, and few small T-cells scattered throughout (Figure 1). There was no overt evidence of the patient's known CLL in the sections examined. It is worth mentioning that the original diagnostic trephine biopsy showed a typical indolent CLL (Figure 2), and adverse prognostic mutations were identified at the time of diagnosis, specifically borderline ATM and IGH VH.

Immunohistochemistry (IHC) was consistent with a germinal centre B cell lymphoma: CD10+, CD20+, BCL2-, and a high ki-67 proliferation index. Fluorescence in situ hybridization (FISH) was performed and showed no evidence of the MYC gene rearrangement. Subsequent FISH analysis revealed 11q aberration characterized by proximal gains of 11q23 and telomeric losses of 11q24 (Figure 3). Furthermore, polymerase chain reaction (PCR) - based clonality studies were conducted to compare the clonality between the original diagnostic CLL and this new transformed 11q Burkitt-like case. Shared clonality was identified between the two cases. These findings support a potentially unrecognized transformation from CLL to Burkitt-like lymphoma with aberrant 11q.

Discussion

Burkitt lymphoma is an aggressive B-cell lymphoma with the hallmark MYC oncogene overexpression. Burkitt-like lymphomas with 11q aberration was first described in 2014 and refers to a subset of MYC-negative, high-grade B-cell lymphomas with 11q aberration on FISH.[1] Previously, such cases were reported as histologically indistinguishable from Burkitt lymphoma, and the authors advocate for FISH analysis for 11q aberration in all MYC-negative high grade B-cell lymphoma cases that resemble Burkitt lymphoma.[2] Whilst this entity is now recognized in the revised 4th (2017) edition of the WHO Classification of Tumours of Haematopoietic neoplasms as BLL-11q,[3] there is no literature recognizing its occurrence in patients with CLL.

CLL is defined as a B cell neoplasm and is the most common leukaemia to affect adults in developed countries.[4] It is known that patients with previous or concurrent CLL can progress to diffuse large B-cell lymphoma, referred to as Richter transformation.[5] Nonetheless, the actual prevalence of association with Burkitt like lymphoma with 11q aberration remains unknown given the recent introduction of the latter and the fact that FISH for 11q has not been routinely undertaken in high grade B-cell lymphomas in CLL patients.

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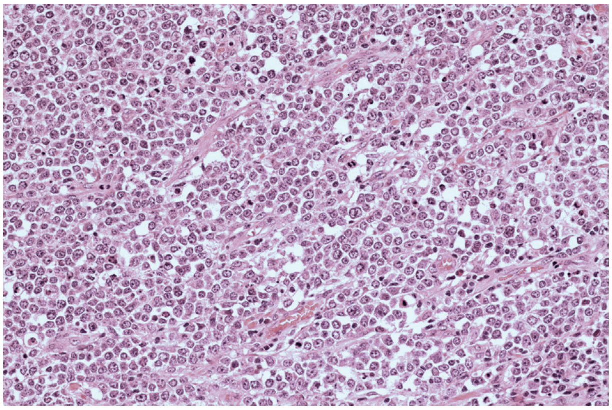

Figure 1 H&E section at ×20 magnification. High grade lymphoma with Burkitt-like morphology.

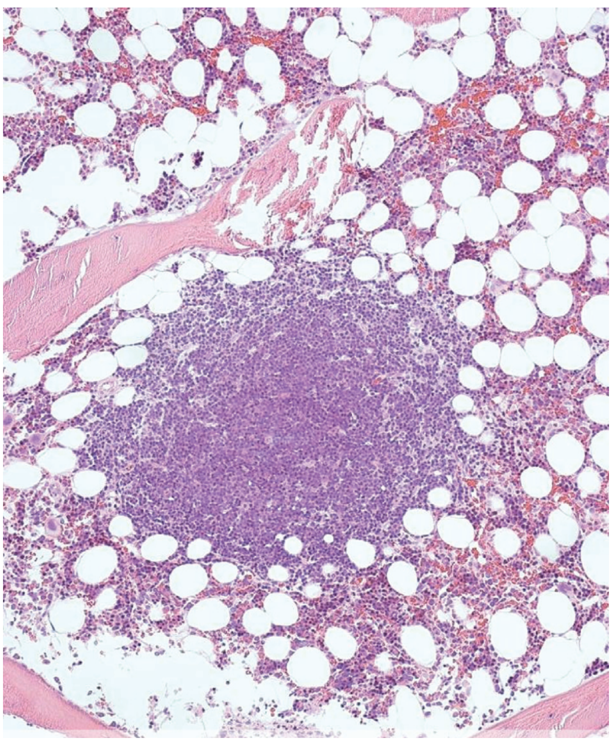

Figure 2 H&E section at ×20 magnification. Initial diagnostic trephine showing typical features of CLL.

This case report describes a unique example of a high-grade B cell lymphoma with Burkitt-like morphology and 11q aberration in a patient with previous CLL. In fact, in our centre, two other cases of patients with longstanding CLL were identified showing transformation into Burkitt-like lymphoma with 11q aberration. All three cases were adult males, the presentation was either nodal or extra-nodal, and the initial diagnostic samples showed at least one adverse mutation. Unfortunately, there was inadequate tissue from the diagnostic biopsies to prove clonality for the other two cases.

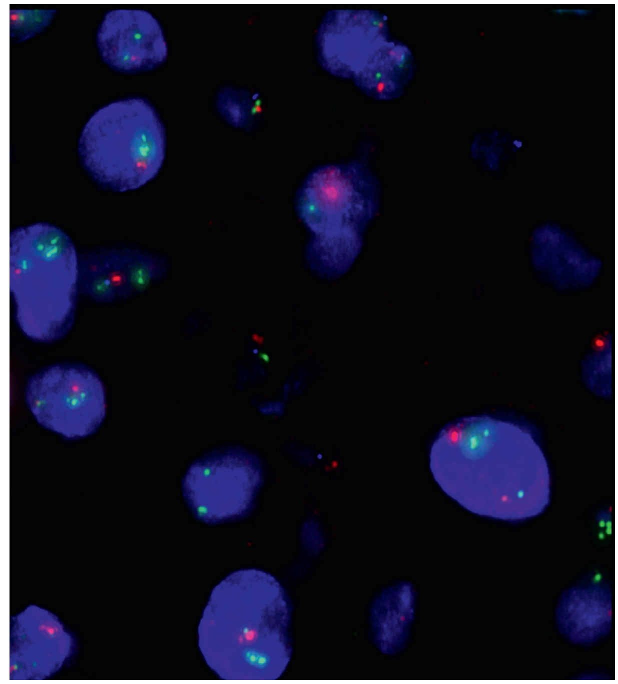

Figure 3 FISH showing 11q aberration.

Conclusion

We report a case of Burkitt-like lymphoma with 11q aberration in a patient with previous long-standing CLL. Although Richter transformation is a well-known transformation to occur in CLL, FISH for 11q aberration and clonality studies have not been routinely undertaken in cases where the relapsed pathology resembles a Burkitt-like lymphoma and is MYC negative. We propose that pathologists should be aware of this potential association, and consider FISH for 11q aberration in such cases. ◆

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Practice points

- Burkitt-like lymphoma with 11q aberration is a recognized entity which differs from Burkitt lymphoma by lacking the hallmark MYC oncogene.
- Although Richter transformation is mostly represented by DLBCL occurs in a low percentage of CLL patient, there is a potential association with the newly recognized entity, Burkitt-like lymphoma with 11q aberration.
- FISH for 11q aberration should be considered in patients with long-standing CLL who present with new Burkitt-like features on histology.
- Optimal clinical management remains undefined in the limited case numbers described.

Self-assessment multiple choice questions

1. What is the definition of richter transformation?

a. The development of high grade lymphoma in patients with previous or concurrent diagnosis of CLL
b. The development of CLL in patients with previous or concurrent Burkitt lymphoma.
c. The name given to a subset of CLL with the worst prognosis.

Correct answer (A)

2. What test is used for clonality studies?

a. Immunohistochemistry
b. FISH
c. PCR

Correct answer (C)

3. What is the hallmark for diagnosis of Burkitt-like lymphoma with 11q aberration?

a. GC phenotype with MYC rearrangement by FISH
b. GC phenotype with 11q aberration by FISH
c. GC phenotype with BCL2 rearrangement by FISH

Correct answer (B)