Correlation of MYC Rearrangement with MYC Immunohistochemistry in Aggressive B-cell Lymphomas

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Abstract

Background

Diffuse large B-cell lymphoma (DLBCL) and related entities are the most common subtype of non-Hodgkin lymphomas. While MYC rearrangement is a molecular hallmark of Burkitt lymphoma, it can be seen in other B cell lymphomas. In aggressive B-cell lymphomas (ABL), it is suggested to be associated with tumor progression and poor prognosis. In this study, we focus on aggressive B-cell lymphomas and correlation of MYC translocation by fluorescence in-situ hybridization (FISH) and C-MYC expression by immunohistochemistry (IHC).

Materials & Methods

All cases were reviewed and diagnosed by DPO. The diagnoses were made in accordance with the 2008 WHO classification for hematopoietic and lymphoid tumors using a combination of immunohistochemical, genetic and other studies, as appropriate, to establish the diagnosis. The tissues were evaluated using both standard hematoxylin and eosin (H&E) staining and immunohistochemistry. Immunohistochemical stains were performed on a variety of platforms from Ventana (Tucson, AZ), Leica BioSystems (Buffalo Grove, IL), and Dako (Carpentaria, CA) using standard methodologies.

Results

We evaluated the correlation of MYC immunohistochemical expression in 117 cases with the presence or absence of MYC translocation (either with IGH partner, non-IGH partner or both in most cases). This included cases of Burkitt lymphoma, DHL, and DLBCL. In most cases, a cut-off for testing MYC FISH was at 50% or greater expression of MYC. There was a general trend that using higher cutoffs correlated more strongly with the presence of a translocation. At 50-59%, no cases were identified with a MYC translocation, with positivity increasing to 91% of cases with 100% MYC expression showing myc translocation.

Discussion

• Cases with unusually low MYC expression may indicate an aberrant MYC protein, and may be an indication to test for MYC translocations
• 18% of cases with K67 of 70% of less (30-70%) had MYC translocations
• K67 does not appear to be an accurate screen for predicting which cases should undergo FISH studies for MYC translocations
• We propose that 50% MYC expression as a cut-off would allow maximal detection without over-utilizing FISH studies

Correlation of MYC immunohistochemistry with MYC FISH and Ki67

MYC expression and correlation with MYC FISH results

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