

A Burkitt Lymphoma Case with Atypical Immunophenotype: Co expression of CD5 and CD10, Cytoplasmic Light Chain Restriction

Uma Kundu, MD, Jacqueline Nguyen, DO, Zhenhong Qu, MD, PhD, Margaret Uthman, MD, Nghia Nguyen, MD
Department of Pathology and Laboratory Medicine, University of Texas-Houston Medical School

ABSTRACT

We report a case of Burkitt lymphoma with an unusual immunophenotypic profile: co expression of CD5 and CD10, positive for cytoplasmic lambda light chain restriction and negative for surface light chain restriction. This profile is quite unusual for Burkitt lymphoma and may present a diagnostic challenge. Definitive diagnosis in this case is established with morphology and cytogenetic study.

CLINICAL DATA / PATHOLOGICAL RESULTS

A 72 year old African American patient admitted to the hospital for suspected occlusion of her left subclavian vein. Her CBC on admission was: WBC $8 \times 10^3/\text{mm}^3$, platelets $321 \times 10^3/\text{mm}^3$. No abnormal lymphocytes were seen in peripheral blood smear. Upon physical examination, the patient was found to have a right supraclavicular node mass along the anterior aspect of her right clavicle. Surgical excision further characterized this lesion as an extension of a node at the deep base of the neck. H&E preparations showed morphologic features consistent with Burkitt lymphoma: monomorphic medium-sized lymphoblasts with many mitotic figures and many tingible-body macrophages (Figs. 1-2). These findings correlated with previous FNA findings of medium-sized lymphoblasts with monotonous appearance. Immunophenotyping by flow cytometry revealed a dominant B cell population that is positive for CD5, CD10, CD19, CD20, FMC7, cytoplasmic lambda light chain restriction; negative for TdT, surface light chain restriction and CD23. Immunoperoxidase stains also confirmed flow cytometry results (Figs. 3 and 5). In addition, immunoperoxidase stains showed that the malignant cells are >90% positive for Ki-67 >90% (Fig. 4) and are negative for Bcl-2. Fluorescence in-situ hybridization (FISH) detected a t(8;14) translocation involving MYC and IgH.

DISCUSSION

Burkitt lymphoma is a high grade lymphoma composed of germinal center B cells. It presents in 3 clinical settings: endemic, sporadic, and immunodeficiency-related. Peripheral lymphadenopathy is less common than extranodal tumor. Bone marrow involvement is common.

Microscopically, the pattern of growth of Burkitt lymphoma is usually diffuse. Tumor cells are round/ovoid with clumped nuclear chromatin and several basophilic nucleoli. Cytoplasmic small vacuoles containing fat are prominent on Giemsa touch preps. Mitoses are numerous and a prominent “starry sky” pattern due to tingible-body macrophages is characteristic, as seen in our case.

Virtually all cases of Burkitt lymphoma are of B cell lineage. Surface immunoglobulins, especially IgM, are expressed with heavy and light chain restriction. B-cell specific antigens such CD19, CD20, and CD22 are present, along with CD10. The tumor cells do not express TdT.

The expression of CD5 in this case is highly unusual as CD5 is a 67kd signal-transducing glycoprotein involved in the regulation of T cell activation. CD5 is a T cell marker that is aberrantly expressed in B cell chronic lymphocytic leukemia and mantle cell lymphoma. Other B cell neoplasms, including Burkitt lymphoma are typically CD5-negative. Also unusual is the positive cytoplasmic light chain restriction, as most cases are only positive for surface light chain restriction.

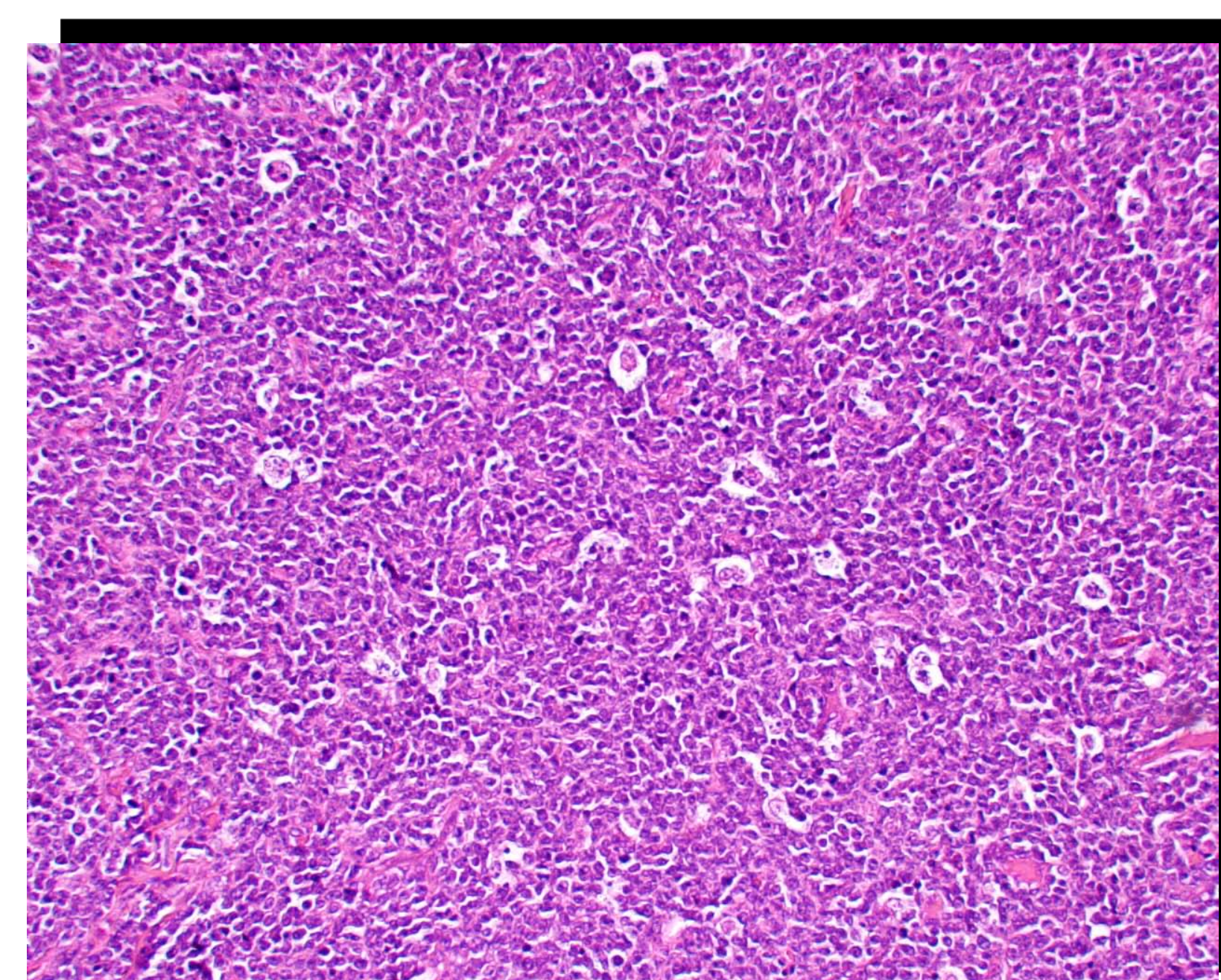


Fig. 1 (10X). Diffuse pattern with numerous mitoses, tingible-body macrophages leading to “starry sky” appearance.

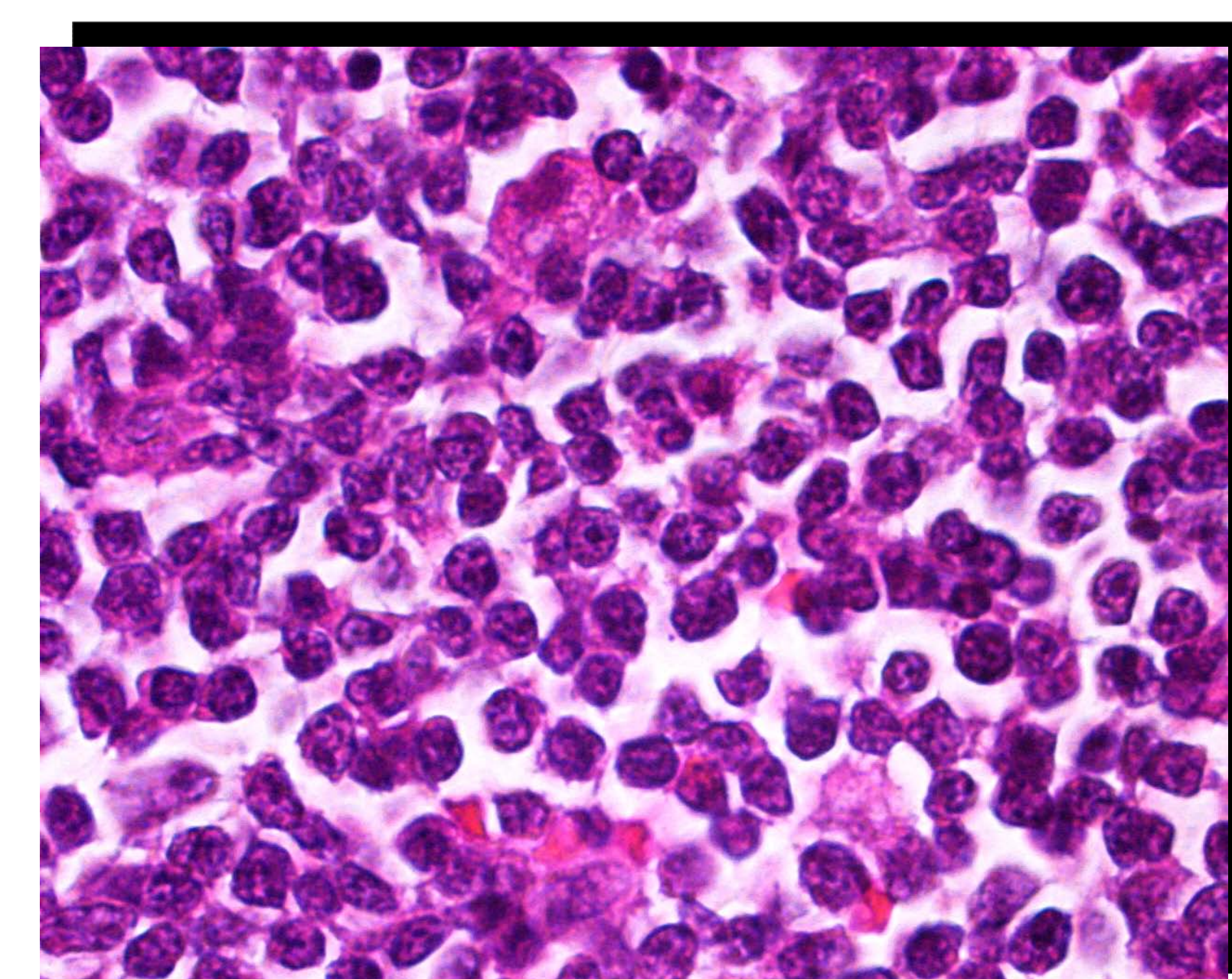


Fig. 2 (40X). Round/oval tumor cells with coarse chromatin, thick nuclear membrane, and prominent basophilic nucleoli.

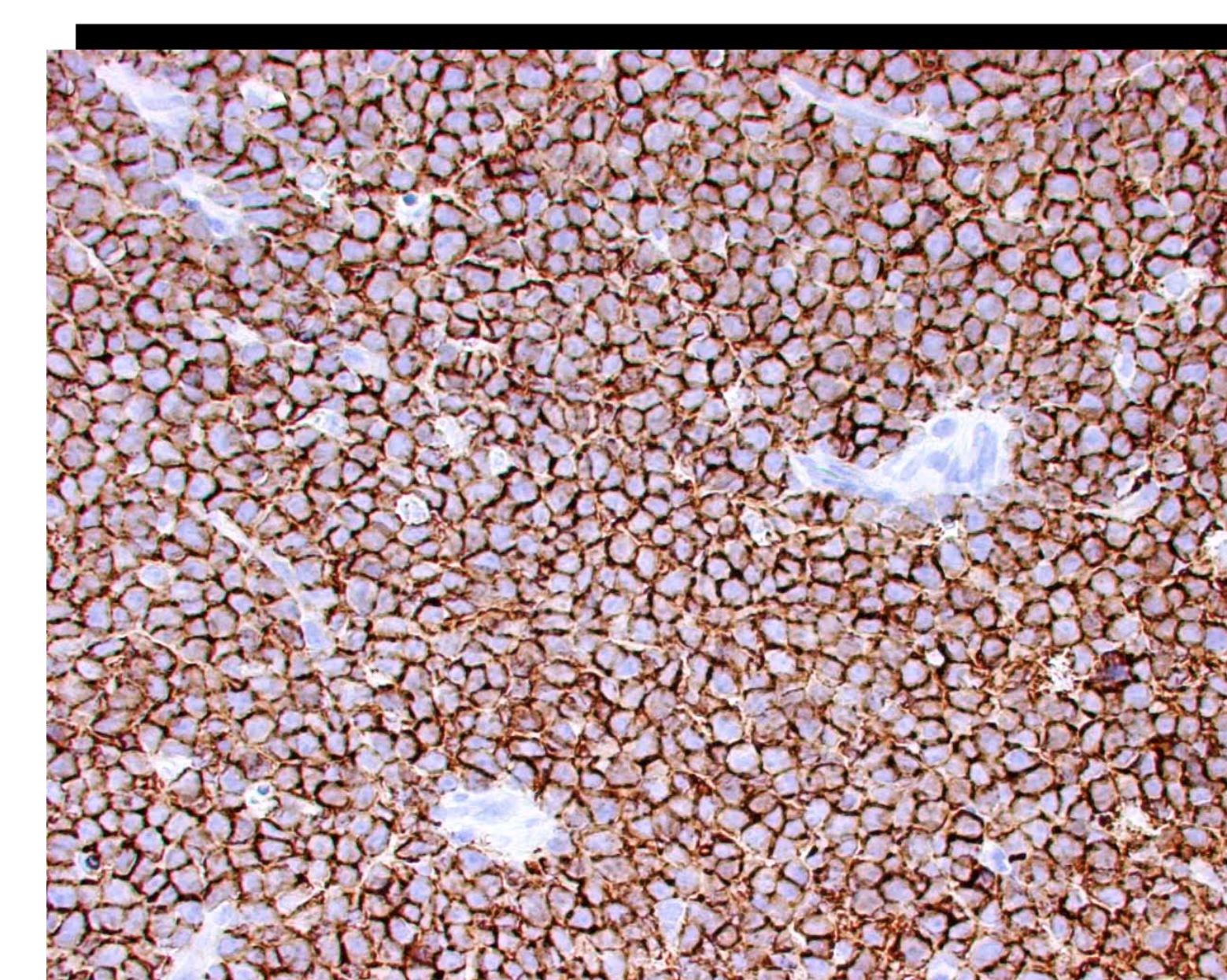


Fig. 3 (10X). Positive CD20 immunoperoxidase stain

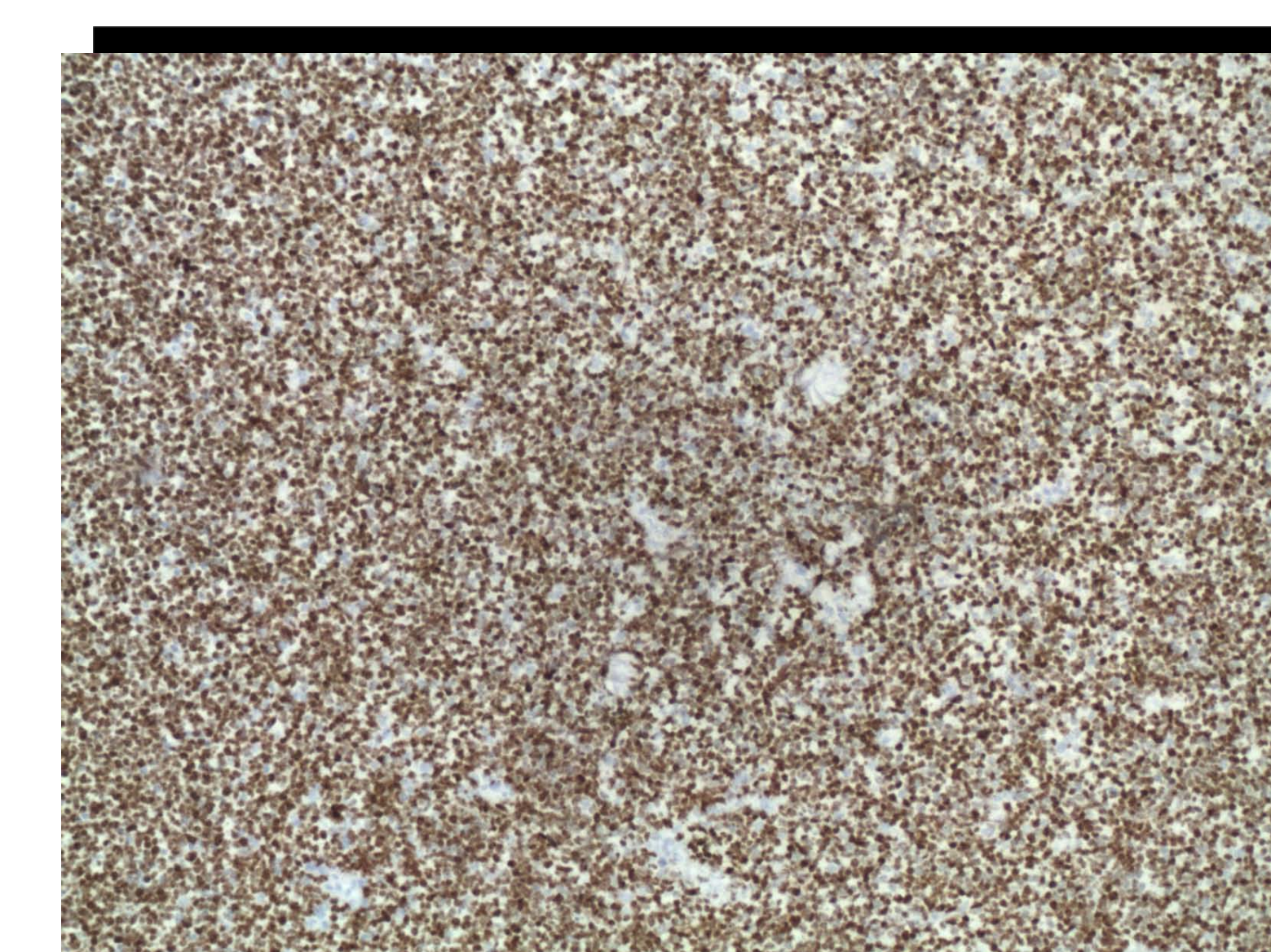


Fig. 4 (10X) Positive Ki-67 (>90%) immunoperoxidase stain

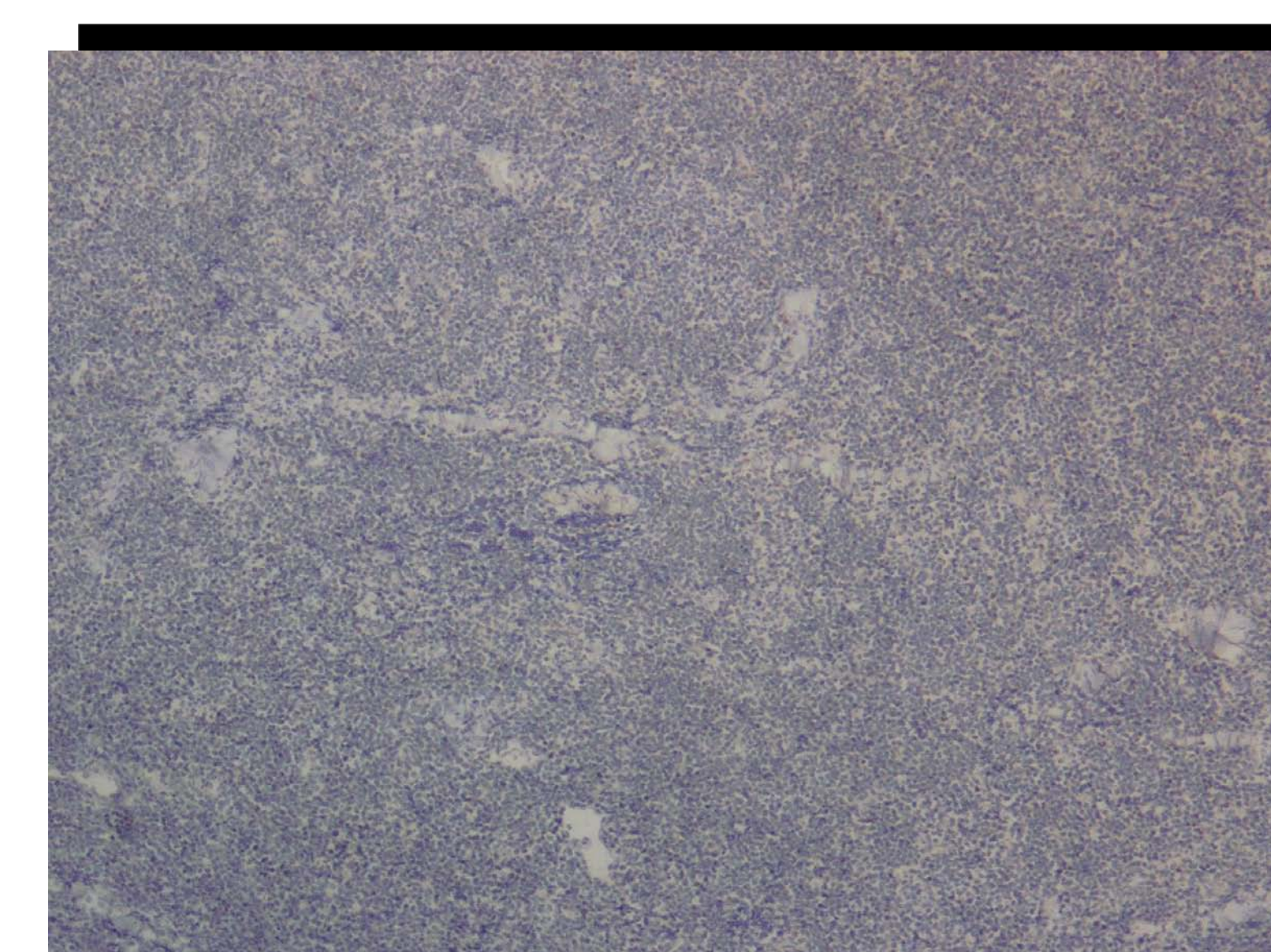


Fig. 5 (10X). Negative TdT immunoperoxidase stain.

SUMMARY

Co expression of CD5 and CD10 is very unusual for B cell neoplasms and can present a diagnostic challenge. Although the basis for this co expression is unclear, possible explanations include the expression of CD5 in B cell lymphomas as an acquired phenomena under neoplastic conditions.

Immunophenotyping is of major importance for diagnosis and classification of lymphoma, however accurate diagnosis in challenging cases such as this one should also depend on comprehensive profiling that includes morphological evaluation and cytogenetic studies.

REFERENCES

1. Lin CW, O'Brien S, Faber J, Manshouri T, Romaguera J, Huh YO, Kantarjian H, Keating M, Albitar M. De Novo CD5+ Burkitt Lymphoma/Leukemia. American Journal of Clinical Pathology, Dec 1999. 112(6): 828-835.
2. Dong H, Gorczyca W, Liu Z, Tsang P, Wu D, Cohen P, Weisberger J. B cell lymphomas with Co expression of CD5 and CD10. American Journal of Clinical Pathology 2003. 119:218-230.
3. Rosai, J. Surgical Pathology, Ninth Ed. Mosby 2004. 1952-1963
4. Jaffe ES, Harris NL, Stein H, Vardiman JW. Pathology and Genetics of Tumours of the Haematopoietic and Lymphoid Tissues. Lyon: IARC Press, 2001