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LETTER TO THE EDITOR

Coexpression of cytokeratin and B cell markers—a rare finding with new implications

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A 66 year-old woman presented with a breast mass and bilateral axillary adenopathy. Clinicians were initially concerned for the possibility of breast carcinoma, but a breast biopsy demonstrated reactive changes and no malignancy. A subsequent axillary lymph node biopsy revealed a neoplastic proliferation composed of sheets of large atypical cells with ovoid to angulated nuclei, clumped chromatin, distinct nucleoli, and scant eosinophilic cytoplasm (see Fig. 1a).

Immunohistochemical stains were positive for lymphoid and B cell antigens, including CD45, CD20 (see Fig. 1b), PAX5, CD79a, CD5, CD10, BCL2, BCL6, and MUM1, but negative for cyclin D1 and TdT. No kappa or lambda light chain restriction was seen. The Ki67 proliferation index was approximately 90 %. A cMyc stain was positive, and an EBV-EBER in situ hybridization was negative.

Interestingly, immunohistochemical stains were also positive for epithelial markers, including pan keratin AE1/AE3 and CAM5.2, showing a golgi or dot-like staining pattern (see Fig. 1c, d), as well as NSE. Other epithelial and neuroendocrine markers were negative, including keratin 7, keratin 20, EMA, TTF-1, synaptophysin, and chromogranin.

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Fluorescence in situ hybridization (FISH) studies showed no evidence of a t(14;18) *IGH@-BCL2* translocation, *BCL6* gene rearrangement, or *MYC* gene rearrangement, but did show 3q− in 40 % (120/300) and 18q+ in 40.6 % (122/300) of nuclei examined. Molecular studies were performed, and a VH gene rearrangement study was positive for a clonal B cell gene rearrangement.

This case represents a diagnostic challenge between an aggressive B cell lymphoma and Merkel cell carcinoma (MCC). MCC features monomorphic cells and can have similar morphology to blastic and high-grade lymphomas and has recently been shown to express lymphoid markers including PAX5, TdT, and immunoglobulins in addition to their known expression of cytokeratins and neuroendocrine markers [1]. MCC is associated with chronic lymphocytic leukemia (CLL), immunosuppressed states including HIV and organ transplantation, and the recently discovered Merkel cell polyoma virus (MCPyV). Increasing evidence shows overlap between MCC and B cell lymphomas, including a B cell immunophenotype as well as a subset of MCC cases showing positive B cell gene rearrangements. The origin of MCC is not completely understood, and the aforementioned group has postulated that perhaps MCC is derived from precursor B cells [1].

On the other hand, aberrant keratin expression has been reported in high-grade B cell lymphomas [2]. PAX5 binding sites in the CK20 promoter could explain keratin expression in non-epithelial cells [3, 4]. Additionally, cytokeratin expression has been demonstrated in SV40 virally transformed human fibroblast and other non-epithelial tumor cell lines [3, 5].

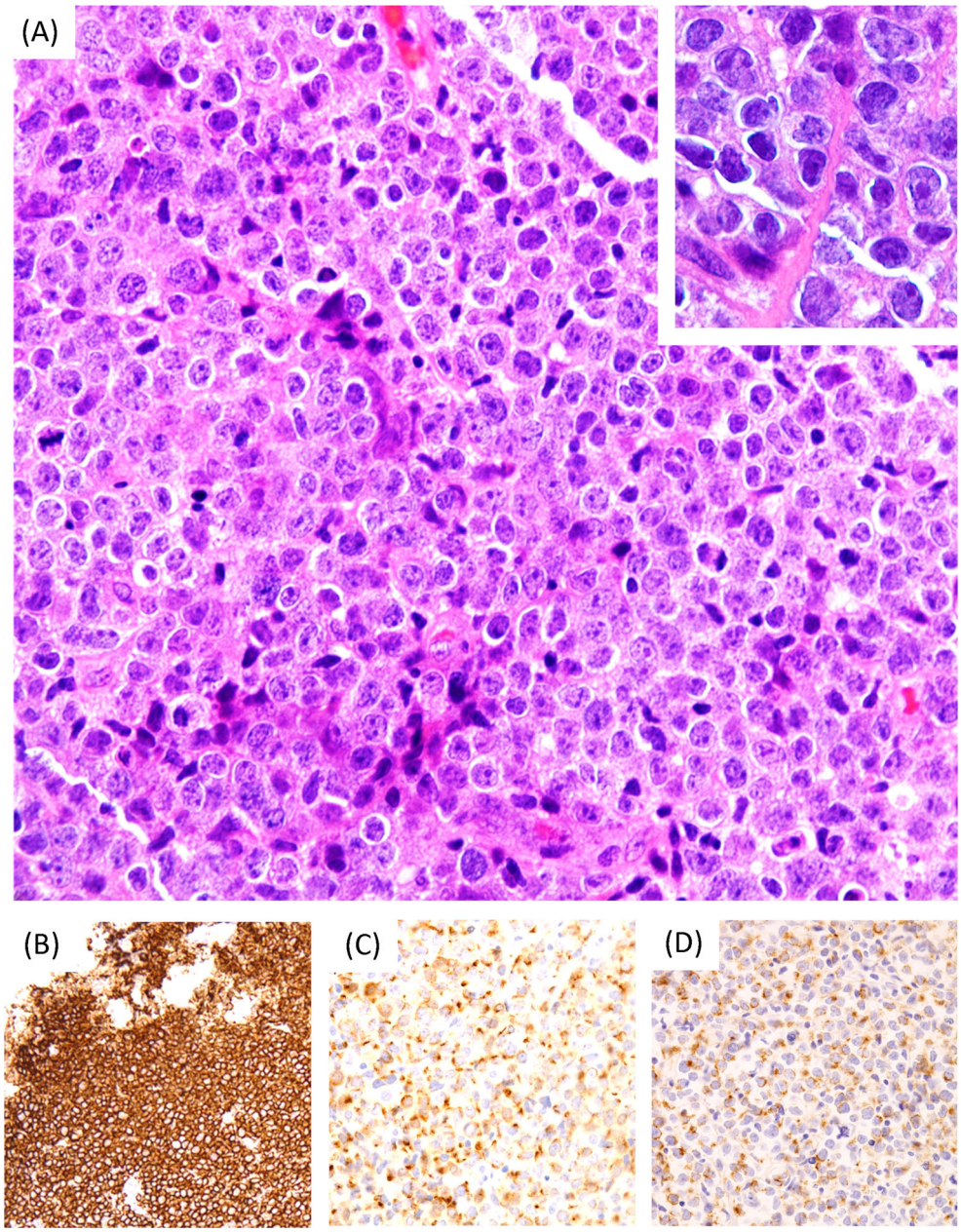

Fig. 1 Microscopic photographs. **a** Sheets of large atypical cells (H&E stain, ×100; *inset* ×400). **b** CD20 immunohistochemical stain, ×100. **c** Pan keratin AE1/AE3 immunohistochemical stain, ×100. **d** CAM5.2 immunohistochemical stain, ×100

In this particular case, we favor a blastic B cell neoplasm over MCC, because of the strong lymphoid marker expression, abnormal expression of cMyc, lack of other epithelial or neuroendocrine markers, and a positive clonal B cell gene rearrangement. The clinical presentation of bilateral adenopathy is also compatible with a lymphoproliferative process, and full consideration of clinicopathologic context is especially warranted in difficult cases such as this. A subsequent bone marrow biopsy showed no pathologic findings and was negative for neoplasm. The patient has since been lost to follow-up.

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Conflict of interest The authors declare that they have no conflict of interest.

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