

Guideline

Subject: Approach to breast implant seroma fluid assessment
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Reviewed By: Cytopathology Advisory Committee
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Background

Breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) is a rare disease occurring in the setting of breast implants, with onset on average 7-10 years post implantation. BIA-ALCL was first reported in 1997 and is a provisional entity in the current WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues. BIA-ALCL has been reported almost exclusively associated with textured surface implants and late onset effusions (defined as over 1 year post implantation). Removal of the implant is critical for the treatment of BIA-ALCL and is undertaken when patients have positive cytology. Patient outcomes are typically excellent following complete removal of the capsule and implant. Most patients have disease confined to the capsule on histological assessment and do not require additional treatment.

Cytology and ancillary studies

BIA-ALCL is a neoplasm of T cells that are usually large (1.5 to 5 times larger than a mature lymphocyte), with pleomorphic nuclei, prominent nucleoli and abundant cytoplasm. The neoplastic cells are typically abundant in fluid specimens involved by BIA-ALCL (70% of cellularity in many cases), with admixed macrophages and lymphocytes.

The neoplastic cells express CD30 but not anaplastic lymphoma kinase (ALK) protein, and do not show ALK gene rearrangement. They are usually positive with antibodies to CD4 and CD43 (80%), however there is frequently loss or incomplete expression of other T cell markers (CD3, CD5, CD2, CD7).

Other lymphomas associated with breast implants have been reported but are exceptionally rare (NK/T cell lymphoma nasal type, follicular lymphoma, nodal marginal zone lymphoma). In some cases, other malignancies may need to be considered, for example metastatic carcinoma or melanoma, and immunohistochemistry should be directed accordingly.

Breast seroma fluid found adjacent an implant should routinely be submitted to the cytology laboratory. Routine flow cytometry is not recommended in the diagnosis of BIA-ALCL, but may be carried out in some institutions. BIA-ALCL is challenging to identify on flow cytometry and can result in both false positive and false negative results. In general, flow cytometry should be utilized at the discretion of the cytopathologist, or if other non-Hodgkin lymphoma subtypes are suspected.

Suggested laboratory protocol

1. The fluid (ideally at least 50ml) should be submitted to the laboratory either fresh or in Hank's (balanced salt solution), RPMI (culture medium) or similar solution.
2. Spin the fluid, take off the supernatant, and from the residuum prepare 2 direct smears or cytopsins (as per local preference) and stain with Pap and Diff Quik.
3. Prepare a cell block (H&E).

4. If atypical cells are present on the smears and representative material is present in the cell block, stain with CD30 and other stains as required (eg. T and B cell markers, macrophage markers, cytokeratins and melanoma markers).
5. Residual fluid can be kept in the fridge. If there is a request for flow cytometry the specimen can be sent following slide review if indicated (for example for assessment of non-ALCL lymphoid neoplasm), but should not be routinely performed to the detriment of optimising cell block preparation in the diagnosis of BIA-ALCL.

References

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