Breast Implant Associated Anaplastic Large Cell Lymphoma (BIA-ALCL) Investigation

Purpose

The purpose of this document is to provide medical imaging staff with a guideline for the investigation of breast implant associated anaplastic large cell lymphoma (BIA-ALCL).

Site Applicability

This guideline applies to Lower Mainland Medical Imaging (LMMI) staff within Fraser Health (FH), Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH) who perform breast biopsy procedures.

Practice Level

Radiologists, residents and fellows.

Need to Know

- BIA-ALCL new provisional category in the 2016 World Health Association (WHO) classification of lymphoid neoplasms
- Knowledge on BIA-ALCL is continuously evolving and all information and guidelines included are subject to change as additional data emerges
- Most common in textured implants (macrotextured) or smooth implants with a history of exposure to textured implants.
- Implant filling with saline or silicone is not directly implicated in BIA-ALCL.
- BIA-ALCL may present as an effusion, mass, skin rash or ulcer in a patient who has implants for greater than one year
    - Typical presenting features are sudden-onset breast swelling secondary to effusion (85%) or as a palpable mass (15%) adjacent to the prosthesis in the affected breast.
    - Majority of patients have unilateral disease
- Peak incidence is 8-10 years post implantation, range is 2 -22 years
- Uncommon in symptomatic patients and extremely unlikely in asymptomatic patients

Guideline

1. Routine imaging of asymptomatic patients is not indicated.
2. If symptomatic swelling or pain:
    - ultrasound is the initial test to assess for implant integrity, the presence of a significant effusion, the presence of a focal mass involving the capsule and axillary adenopathy.
3. It is normal to have 10-15cc of fluid around all breast implants which will look like angular pockets. These cases are considered normal.

4. In cases of BIA-ALCL, there is usually 100-1000 ml of fluid surrounding the implant. Differential dx of peri-implant collection includes infection, inflammation, implant rupture, seroma, hematoma, malignancy, silicone gel bleed and BIA-ALCL.
    - BIA-ALCL: usually manifests as a homogeneous peri-implant effusion with inflammatory changes in the periprosthetic breast tissue, associated in some cases with irregular capsule contour.
5. When a significant effusion is present, aspiration of the maximum volume of fluid that can be safely removed (50 ml or more to increase accuracy of cytology) is indicated.
    a. Fluid sent in Cytolyte for assessment.
    b. Pathology has asked to clearly state clinical question "Possible BIA-ALCL" and to leave to their discretion if/when to add additional tests (flow cytometry, immunohistochemistry, etc).
6. If a mass is present it usually manifests as oval, hypoechoic, well-circumscribed solid mass without hypervascularity. Complex solid and cystic masses have also been described.
    a. Core biopsy is indicated. Submit in formalin.
7. Axillary adenopathy, while not commonly present with BI-ALCL, if discovered needs core biopsy.
8. Sonographic assessment of the contralateral implant is recommended.
9. If patient remains symptomatic with borderline effusion, re-evaluate with US or MRI in 2-4 weeks.

Table 1: <u>BIA-ALCL Diagnosis and Treatment. NCCN consensus guidelines</u>

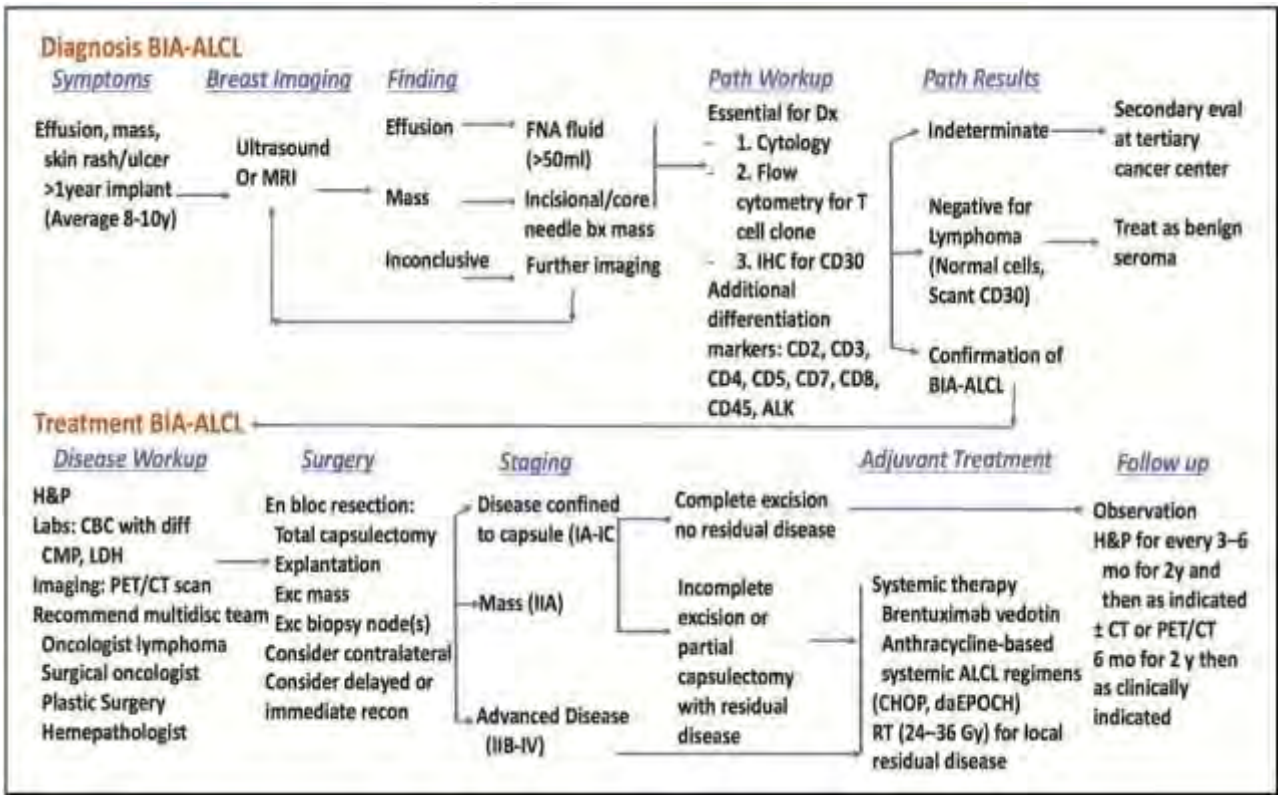

Table 2: Strengths and Weaknesses of Radiologic Techniques in BIA-ALCL (RG 2020)

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Imaging Finding, Purpose, or Aspect	Modality					
	US	Mammography	Breast MRI	CT	PET	Whole-Body DWI
Effusion	First-line test Accurate	Not accurate	Second-line test Accurate	Accurate	Demonstrates effusion Accurate	Demonstrates effusion Accurate
Mass component	First-line test Accurate	Not accurate	High accuracy	Accurate	Demonstrates mass Accurate	Demonstrates mass Accurate
Biopsy guidance	First-line test	Not useful	Can be used	Not routinely used	Not routinely used	Can be used
Whole-body staging	Not provided	Not provided	Not provided	Provided Second-line test	Provided First-line test	Provided Research indication
Radiation exposure	None	0.4 mSv	None	15 mSv	14–24.4 mSv*	None
Intravenous contrast material injection	None	None	Administered (unless contraindicated†)	Administered (unless contraindicated†)	Administered	None
Causes of false positives	…	…	Internal mammary chain Axillary lymphadenopathy	Internal mammary chain Axillary lymphadenopathy	Breast implant capsule uptake Internal mammary chain Axillary lymphadenopathy	Internal mammary chain Axillary lymphadenopathy
Causes of false negatives	…	Effusion Mass	…	Bone marrow	Effusion Bone marrow	Bone marrow—research application

Note.—Assessment of BIA-ALCL is nuanced, in the context of both the peri-implant effusion subtype and the mass-forming or distant disease subtype. To ensure accurate and optimal patient management, it is critical to appreciate the strengths and limitations of the panoply of imaging techniques in this unique condition. DWI = diffusion-weighted imaging.

*Dose dependent on the PET/CT technique.

†Contraindications to intravenous contrast material include patient allergy.

Table 3: Diagnosis, Staging, Response Assessment and Surveillance Strategies for the Peri-implant Effusions and Mass-forming or Distance Disease Subtypes of BIA-ALCL (RG 2020)

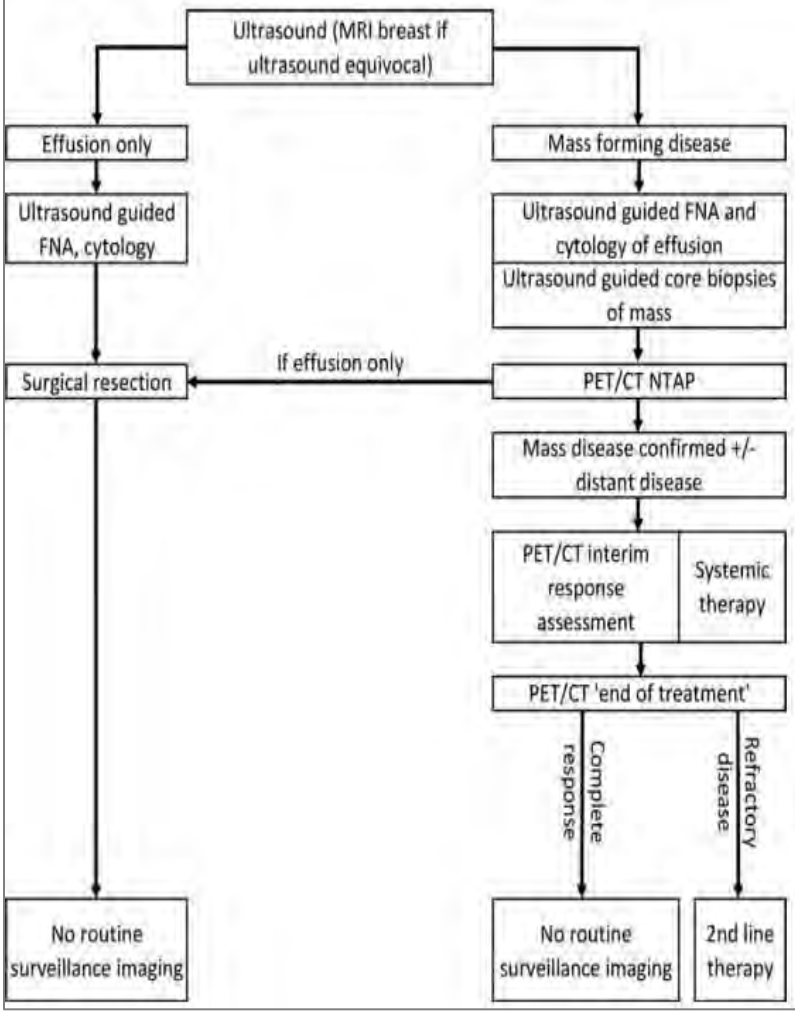

Figure 11. Diagnosis, staging, response assessment, and surveillance strategies for the peri-implant effusion and mass-forming or distant disease subtypes of BIA-ALCL. Original pathway diagram summarizes patient management paradigms for accurate staging and response assessment with optimal use of currently available imaging and health care resources. *FNA* = fine-needle aspiration; *NTAP* = neck, thorax, abdomen, pelvis.

References

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2. Clemens, M.W: MD, FACS; Jacobsen, E.D. MD; Horwitz S.M. MD March, 2019. Aesthetic Surgery Journal,Volume 39 pages S3-s13. 2019 NCCN Consensus Guidelines on the Diagnosis and Treatment of Breast Implant-Associated Anaplastic Large Cell Lymphoma (BIA-ALCL) https://academic.oup.com/asj/article/39/Supplement_1/S3/5304919
3. American College of Radiology ACR Appropriateness Criteria® Breast Implant Evaluation. 2018. AmericanCollege of Radiology. https://acsearch.acr.org/docs/3100728/Narrative/
4. Sharma B; Jurgensen-Rauch A; Pace E; Attygalle A.D; Sharma R; Bommier a; Wotherspoon C; Sharma S. Lyengar S; El-Sharkawi D; Apr 17, 2020. Breast Implant-associated Anaplastic Large Cell Lymphoma: Reviewand Multiparametric Imaging Paradigm. RSNA RadioGraphics Vol. 40, no.3, April 2020. https://pubs.rsna.org/doi/abs/10.1148/rg.2020190198

Definitions

"biopsy marker" refers to a clip or marker made of surgical grade material used to identify the biopsy site after removal of tissue samples.

"Staff" means all employees, approved students including but not limited to radiologists, supervisors, managers, technologists, sonographers, echocardiographers, nurses, aides, clerical staff and support staff engaged by LMMI.

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	1.0	16-FEB-2021	Initial Release	Dr M.J Cloutier, Mammography Medical Practice Lead
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