

Use of Needle Localization in the Surgical Management of Non-seroma, Mass-forming BIA-ALCL

David H. Kim, MD*
Theresa K. Webster, BS†
Joseph G. Bartolacci, PhD†
Sthefano Araya, MD*
Juliet Panichella, BS†
Sameer A. Patel, MD*

Summary: Outcomes related to the treatment of breast implant-associated anaplastic large cell lymphoma, a rare extranodal T-cell lymphoma associated with textured breast implants, are largely dependent on the successful resection to negative margins via en bloc capsulectomy and resection of any associated masses. To date, the use of needle localization, a common technique used in breast surgery, to assist in the complete removal of breast implant-associated anaplastic large cell lymphoma has not been described. We present the case report of a 66-year-old woman, with a previous medical history of left-sided invasive ductal carcinoma, who presented 7 years after textured breast implant placement with a left-sided mass without peri-implant seroma. Biopsy demonstrated breast implant-associated anaplastic large cell lymphoma and the associated breast mass extended beyond the capsule borders. The present report describes the novel use of needle localization in this patient to facilitate the complete removal of the malignancy-associated mass with maximal preservation of the overlying soft tissue envelope. (*Plast Reconstr Surg Glob Open* 2022;10:e4286; doi: [10.1097/GOX.0000000000004286](https://doi.org/10.1097/GOX.0000000000004286); Published online 25 April 2022.)

Textured breast implants were designed to reduce the rate of capsular contracture and to prevent rotation of anatomically shaped implants. More recently, an association between textured implants and breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) has been established.¹⁻³ This cancer is a rare extranodal T-cell lymphoma that presents most commonly as a peri-implant effusion.^{2,3} The first case report stems back to 1997, and the FDA issued its first warning in 2011⁴. Since its discovery, over 800 patients have received a confirmed diagnosis of BIA-ALCL worldwide.⁵

The most common symptom is a persistent seroma; however, a smaller percentage will present with only a mass.^{2,3,5} When diagnosed early, BIA-ALCL is highly treatable with excellent overall 5-year survival.⁵ The current gold standard for diagnosis relies upon cytopathology to define immunophenotypic marker expression and abnormal T-cell morphology. Complete surgical excision with en bloc

capsulectomy and resection of associated masses has been shown to nearly eliminate the risk of recurrent disease.^{2,3,6,7}

Once diagnosed, National Comprehensive Cancer Network guidelines recommend a complete disease workup, including a history and physical, relevant laboratory work, PET/CT scan, and assembly of a multidisciplinary team.² Surgery should include en bloc capsulectomy with associated fluid, and complete surgical excision of any mass, and involved lymph nodes. However, the guidelines do not mention the use of needle localization as an adjunct for treatment.

CASE REPORT

A 59-year-old woman, with a previous medical history of hypertension and diabetes, presented with left breast pain and skin thickness. She had no family history of breast cancer. She was diagnosed with stage IA left-sided invasive ductal carcinoma at an outside institution in 2013. The patient underwent a left-sided mastectomy with lymphatic mapping, sentinel lymph node biopsy, and left breast subpectoral tissue expander placement. She received adjuvant chemotherapy, which was initially delayed as she had a surgical site infection at the left breast incision. Upon completion of chemotherapy, she underwent a reduction mammoplasty of the right breast and exchange of tissue expander for Natrelle 410 highly cohesive silicone-filled textured implant in the left breast.

Approximately 7 years after the initial diagnosis, the patient reported that she felt a lump in her left upper outer breast. An ultrasound-guided breast biopsy was

From the *Division of Plastic and Reconstructive Surgery, Fox Chase Cancer Center, Philadelphia, Pa.; and †Lewis Katz School of Medicine, Temple University, Philadelphia, Pa.

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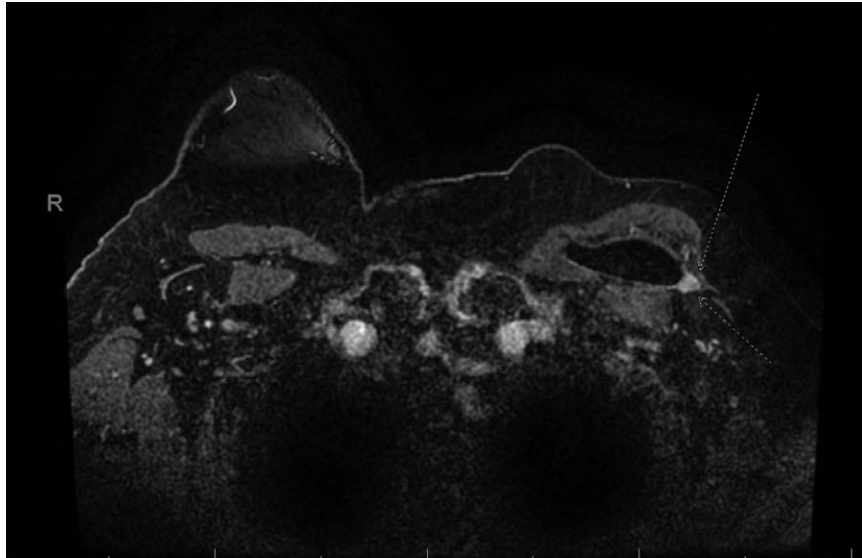


Fig. 1. Bilateral breast MRI scan completed in July 2020 showing an oval, circumscribed, homogeneously enhancing mass around the upper-outer capsule of left breast implant with minimal periprosthetic fluid.

performed, which was concerning for BIA-ALCL. The pathology report showed focal diffuse sheets of large cells with marked pleomorphism and a smaller population of lymphocytes and eosinophils. The large cells stained positive for CD2, CD4, CD30, CD163, CD1a, MUM1, perforin, and variable positivity for CCND1 and p63. The Ki67+ index was 50%–60%. An MRI of the breasts showed a minimal amount of fluid around the left breast implant and an enhancing mass around the upper-outer capsule of the left breast implant. The mass measured 1.6 cm × 1.5 cm (Fig. 1). A PET/CT scan in July 2020 noted hypermetabolic activity in the anterior outer quadrant of the breast.

The patient underwent complete surgical excision with en bloc capsulectomy of the left breast. Preoperative ultrasound-guided needle localization of the breast mass was performed to help guide localization (Fig. 2). Resection of the mass was then directed by the needle localization wire (Fig. 3). The resection was confirmed by mammogram,

which showed the clip and needle localization wire within the specimen (Fig. 4). The pathology report from the left breast specimen showed no evidence of residual tumor and no evidence of tumor in the three lymph nodes removed within the specimen. There was an area of atypical lymphohistiocytic infiltrate, but the cells did not have the same immunophenotype or morphology as the cells from her June 2020 ultrasound-guided biopsy, suggesting the tumor may have been excised with the original biopsy. The patient has routinely followed with medical oncology and has not demonstrated any recurrence of disease 18 months after complete resection and explantation.

DISCUSSION

This case report demonstrates the successful use of needle localization to assist in the resection of mass-forming BIA-ALCL complicated by extracapsular extension.

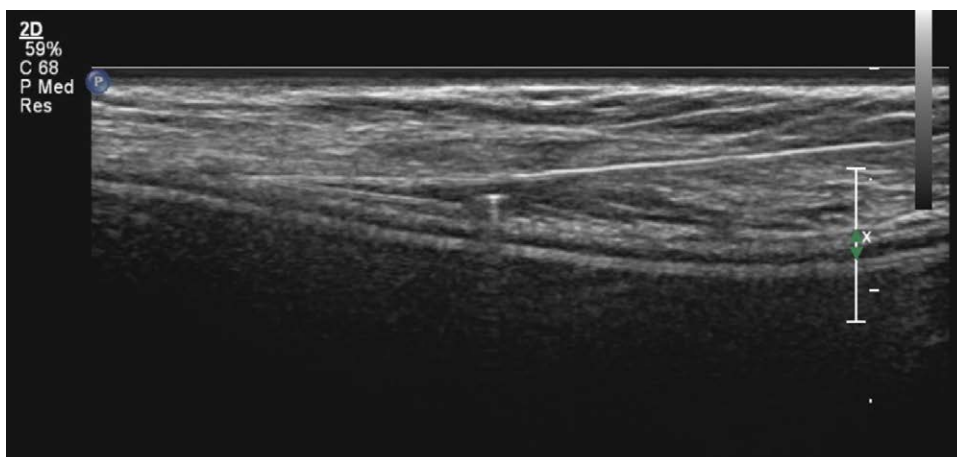


Fig. 2. Preoperative ultrasound image during needle localization procedure.

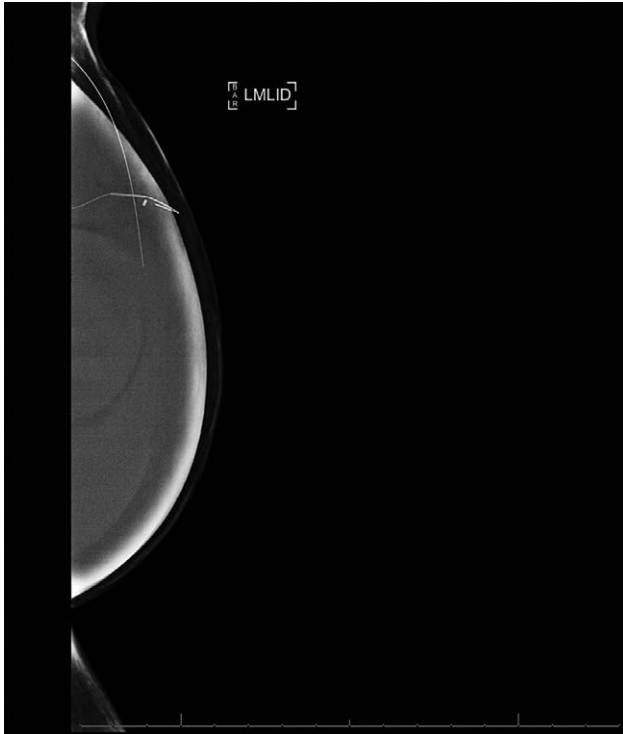


Fig. 3. Preoperative mammogram following wire placement.

Complete resection of the BIA-ALCL is paramount, as partial or incomplete resection increases the risk for recurrence, progression, or dissemination.^{3,6,7} Needle localization offers unique advantages, as it allows for more accurate identification of margins while preserving soft tissue for reconstruction.

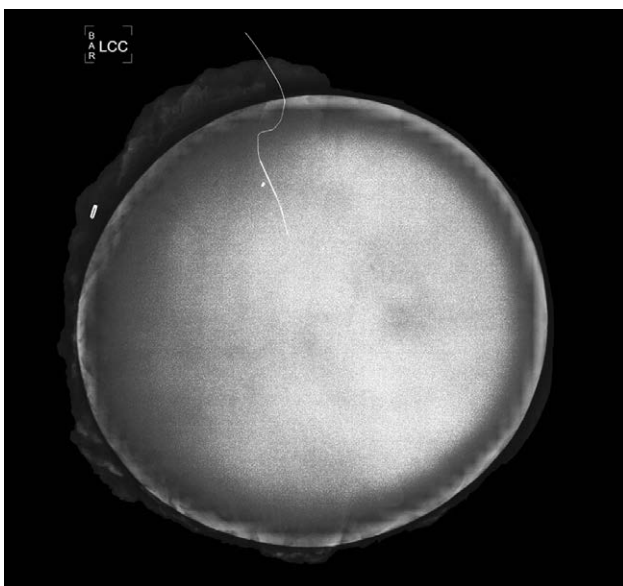


Fig. 4. Radiograph of surgical specimen showing excised tissue with implant and clip and needle localization wire within the specimen.

Needle localization is considered to be the standard of care for reducing positive margins in breast-conserving surgery with nonpalpable tumors.^{8,9} In this technique, a fine wire is inserted percutaneously through a needle with guidance from ultrasound or mammography to mark a lesion. It is a cost-effective procedure that can be performed the same day as the surgical procedure and is readily available in most centers.⁹ Needle localization achieves a clear margin at a rate of 71%–87%, with a recurrence rate of only 1.1%–10%.^{9,10}

Although needle localization is a common technique within the field of breast surgery, given its ease of access, cost-effectiveness, and low recurrence rates, it has not previously been described in the setting of a rare, non-seroma, mass-forming BIA-ALCL. When compared with seroma-only disease, mass-forming BIA-ALCL has lower rates of complete remission and lower survival rates at 3 and 5 years with incomplete resection, but similar survival when the mass was completely excised.¹⁰ Therefore, this case report supports the utilization of needle localization in the management of this rare type of BIA-ALCL presenting as a palpable mass.

While the most important aspect of cancer care is achieving negative margins, the secondary objective is maintaining maximal soft tissue coverage for reconstruction. Wide or inaccurate margins may lead to poor reconstruction outcomes by unnecessarily thinning the soft tissue envelope. Through the use of needle localization, there is greater soft tissue preservation for reconstruction. Therefore, one should consider needle localization, a well-established and readily available technique, as part of our armamentarium of tools to assist in the complete resection of palpable or nonpalpable BIA-ALCL masses while optimizing soft tissue conservation.

CONCLUSIONS

BIA-ALCL is a highly treatable T-cell lymphoma when diagnosed early and adequately. This case presents the use of needle localization as an effective and novel tool to guide the complete surgical excision of a rare, non-seroma, mass-forming BIA-ALCL with penetration through the capsule. Needle localization presents a widely available, cost-effective technique as a means for resection while allowing for maximal soft tissue preservation.

Sameer A. Patel, MD

Fox Chase Cancer Center

333 Cottman Avenue

Philadelphia, PA 19111

E-mail: sameer.patel@fccc.edu

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