Case Report

Implant-Associated Primary Anaplastic Large-Cell Lymphoma With Simultaneous Involvement of Bilateral Breast Capsules

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Clinical Practice Points

- Most reported cases of implant-associated anaplastic large-cell lymphoma (ALCL) involved a unilateral breast, but it can rarely present in both breasts simultaneously.
- Extensive sampling of the breast capsule is recommended because tumor cells may be present only in small numbers.

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Introduction

Primary anaplastic large cell lymphoma (ALCL) associated with breast implants is a rare and usually indolent T-cell lymphoproliferative disorder first described by Keech and Creech in 1997.[1] Currently, > 100 occurrences have been reported worldwide,[2] with approximately 60 cases described in the literature.[1-24] The incidence of this disease is estimated at 0.1 to 0.3 per 100,000 women with breast implants per year.[3] Most patients have unilateral breast involvement by ALCL, with only rare cases having bilateral involvement,[3-5] and 1 reported patient in whom subsequent bilateral axillary lymph node metastases developed.[6] In 2011, the United States Food and Drug Administration recognized the possible association of ALCL with breast prostheses.[25]

Case Report

Our patient was a previously healthy 52-year-old woman who underwent cosmetic breast augmentation with placement of bilateral textured saline implants (McGhan style) in 2004. In August 2012, she had discomfort in the right breast but was asymptomatic in the left breast. Physical examination showed mild erythema and fullness of the right breast with no palpable axillary lymphadenopathy. Bilateral breast ultrasonography and mammography showed a seroma around the right breast implant, but no masses were detected. The left breast was unremarkable. Aspiration of the right breast seroma yielded 300 mL of pink fluid. Cytologic smears and a cell block were submitted to the City of Hope National Medical Center for review; scattered large atypical cells with irregular and multilobated nuclei were found, some of which were "horseshoe-shaped," with prominent nucleoli and abundant cytoplasm, reminiscent of "hallmark" cells (Fig 1A). Scattered small lymphocytes, plasma cells, and occasional histiocytes were also present. Immunohistochemical stains revealed the large atypical cells to be positive for CD2 and CD3, with strong cytoplasmic and membranous expression of CD30, but negative for CD20, ALK1, and cytokeratin. A diagnosis of ALK-negative (ALK^-) ALCL was made and the patient opted for bilateral implant removal and capsulectomy. At surgery, a small amount of residual seroma fluid was noted in the right breast capsule and was sent to the pathology department for cytologic evaluation. The fluid showed the presence of hallmark cells. No fluid collection was observed in the left breast. The textured saline implants were intact and the bilateral fibrous capsules were smooth, with focal thickening of the inner surfaces. No masses were noted, and extensive sampling of both capsules was performed. Microscopic evaluation of the right breast capsule revealed multifocal clusters of large atypical cells on the inner surface in a fibrinous layer (Fig. 1B and C). There was no evidence of tumor infiltration deeper into the capsule, where there was only fibrosis and a reactive lymphoplasmacytic infiltrate. The lymphoma cells stained positive for CD2, CD3, CD4, CD30, epithelial

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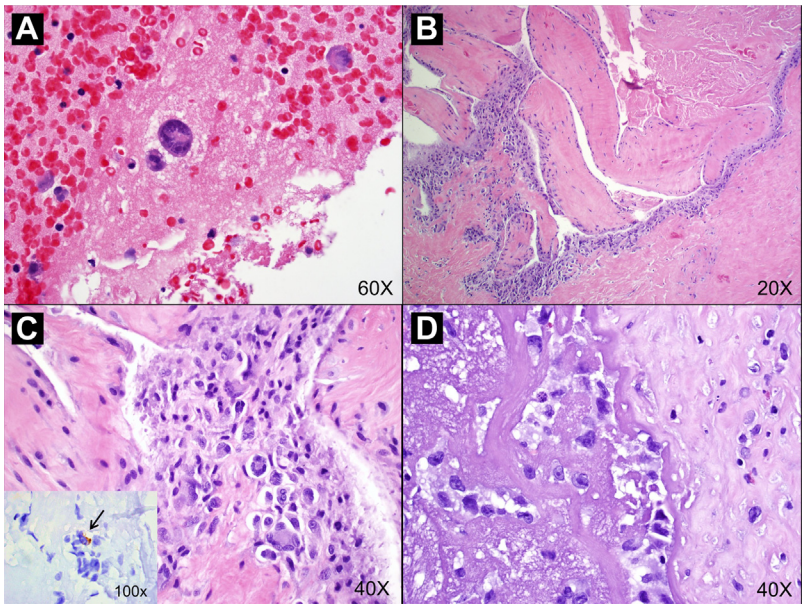
Figure 1 (A) Scattered Large Multinucleated and Occasional "Hallmark" Cells are Noted in a Background of Blood. (B) Section of the Right Breast Capsule With Clusters of Large Atypical Cells in a Fibrinous Layer. (C) Higher Magnification of Tumor Cells From the Right Breast Capsule. (C, Inset) Tumor Cells are Focally Positive for Granzyme B. (D) Similar Large Atypical Cells are Present in the Left Breast Capsule. (A, Wright Giemsa; B, C, and D, Hematoxylin and Eosin; C Inset, Immunohistochemical Analysis.)



membrane antigen (EMA), and TIA1 and were focally positive for granzyme B (Fig. 1C inset), but were negative for CD5, CD7, CD8, CD20, PAX5, and ALK1. The morphologic and immunophenotypic findings were those of implant-associated primary ALCL. Interestingly, similar large atypical cells (Fig. 1D) were also focally present on the inner capsular surface of the seroma-free, contralateral (left) breast, which was clinically and radiographically unremarkable.

Analysis for T-cell receptor gamma-chain gene rearrangement by polymerase chain reaction (PCR) was performed on paraffin-embedded tissue from the right breast capsule and revealed a clonal T-cell population (Fig. 2). Unfortunately, PCR analysis of the left breast capsule failed to reveal a conclusive T-cell clone because of the paucity of tumor cells.

Computed tomographic (CT) scans of the chest, abdomen, and pelvis showed no evidence of lymphadenopathy or other lesions. Positron emission tomography (PET)/CT scans showed increased activity in the right breast and stomach fundus. Biopsies of the stomach revealed nonspecific active gastritis but no evidence of lymphoma. Bone marrow aspirate and biopsy results were negative for lymphoma, and cytogenetic analysis showed a normal female karyotype. The patient received 6 cycles of CHOP

Figure 2 Polymerase Chain Reaction (PCR) Analysis of Paraffin-Embedded Tissue From the Right Breast Capsule Reveals a Clonal T-Cell Gamma-Chain Gene Rearrangement Observed as a Peak at 195 Base Pairs (bp)