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CASE REPORT
Breast

Breast Implant-associated Anaplastic Large Cell Lymphoma after Breast Reconstruction for Breast Cancer

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Summary: A patient initially operated on for aesthetic breast augmentation had a round-textured silicone gel prosthesis, Poly Implants Prothèse, placed in a subglandular plane. The patient developed a bilateral capsular contracture, and 4 years later, underwent a complete bilateral capsulectomy with an exchange of Mentor 215 cm^3 textured cohesive silicone-gel ultra-high profile breast implants in the same subglandular plane. One year later, the patient developed cancer in the right breast, so it was decided to perform a bilateral mastectomy and reconstruction with 265 cm^3 (left) and 310 cm^3 (right) Natrelle (Allergan) round-textured silicone-gel implants in a submuscular plane. Seven years after the last surgery, the patient developed a seroma in the left breast (breast opposite to the one that developed the cancer), and seroma studies reported a CD30-positive anaplastic large cell lymphoma associated with the breast prosthesis. Therefore, bilateral capsulectomy and explantation of both implants with breast reconstruction with autologous tissue were performed. *(Plast Reconstr Surg Glob Open 2023; 11:e4911; doi: 10.1097/GOX.0000000000004911; Published online 7 April 2023.)*

CLINICAL CASE

A 37-year-old patient underwent a bilateral augmentation mammoplasty with round-textured, subglandular silicone gel prostheses Poly Implants Prothèse in 2008. The patient developed a capsular contracture, which, 4 years later, required a bilateral capsulectomy with replacement of the implants for 215 cm^3 round-textured type-I silicone-gel ultra-high profile Mentor implants in the same subglandular plane.

One year later, the patient presented a lesion on the right breast, which was reported a carcinoma in situ. The lesion was marked with a harpoon, and a quadrantectomy with sentinel lymph node was performed in the right axilla. The pathological diagnosis reported an extensive high-grade carcinoma of 20×15×5 mm without stromal infiltration. Surgical margins were free of tumor, but at one edge the tumor was only 0.5 mm from the surgical margin; the sentinel node was negative for malignancy.

With such a narrow margin, a mastectomy of the right breast was performed, and an in situ residual carcinoma of 4 mm was reported with free margins of more than 1 cm. The left breast underwent prophylactic mastectomy at the patient's request and then immediate breast reconstruction was done with Natrelle (Allergan) round-textured implants of 265 cm^3 on the left and 310 cm^3 on the right, in a submuscular plane (pectoralis major and serratus anterior). The oncologist did not perform chemotherapy and radiotherapy; only tamoxifen was given for 5 years, which ended in 2019.

In 2020, she consulted due to significant growth of the left breast without any significant history (Fig. 1). An ultrasound was performed, and reported a seroma of 120 cm^3 of serohematic fluid, which was drained and sent for culture without reporting significant findings, for which she was discharged with antiinflammatories. Two weeks later, the patient returned with a new seroma, for which an MRI with contrast medium was requested, which revealed the presence of periprosthetic fluid (20 cm^3) and a thickening of the left mammary capsule in the super-outer quadrant of 4.3 mm.

The seroma was drained under ultrasound control and sent to pathology for cytology and immunohistochemistry.

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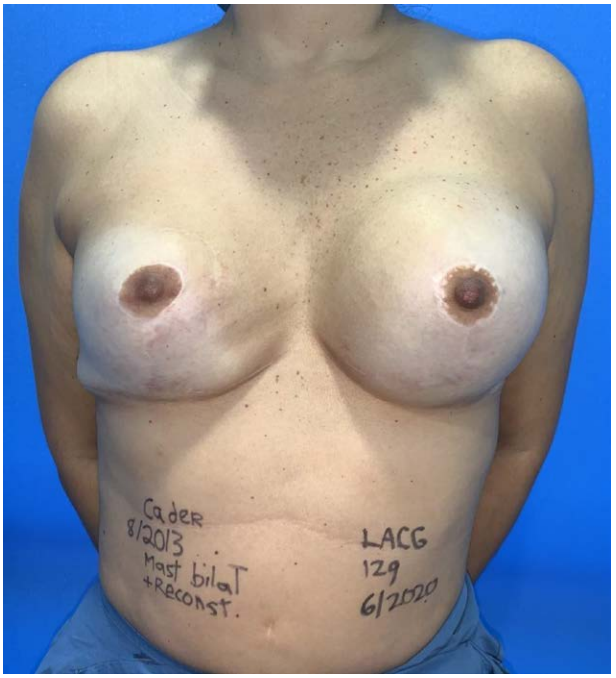

Fig. 1. Breast asymmetry due to left periprosthetic seroma.

Cytology studies reported the presence of eosinophils, lymphocytes, histiocytes, and some larger cells with large cytoplasm, irregular nuclei, and atypical mitoses. Immunohistochemistry was positive for CD30 on tumor cells, with a KI67 proliferative index increased by 60% (Figs. 2 and 3). With the presumed diagnosis of anaplastic large cell lymphoma (BIA-ALCL), the patient underwent surgery for a complete enbloc capsulectomy, including breast implants and breast reconstruction with the remaining breast tissue.

Tissue from the left mammary capsule showed collagenized areas and fibrous tissue on the inner surface and little necrotic and fibrinoid tissue with lymphoid cells with

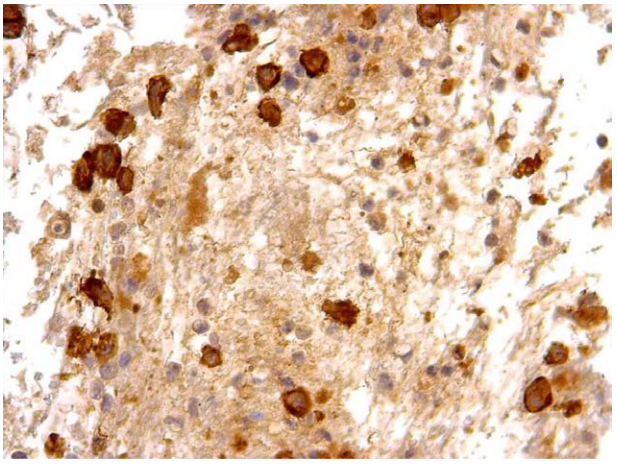

Fig. 2. CD30 immunohistochemistry.

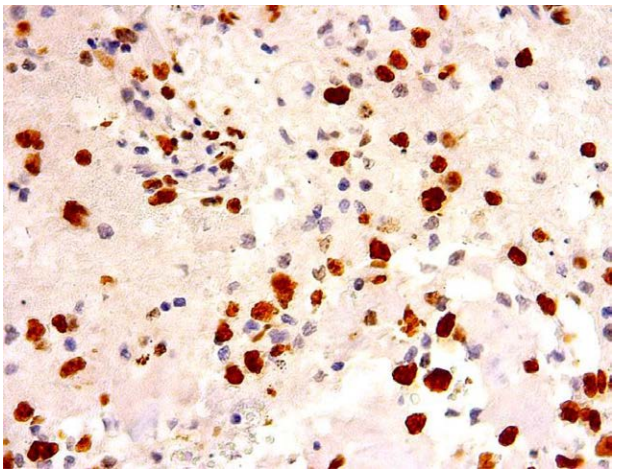

Fig. 3. KI67 immunohistochemistry.

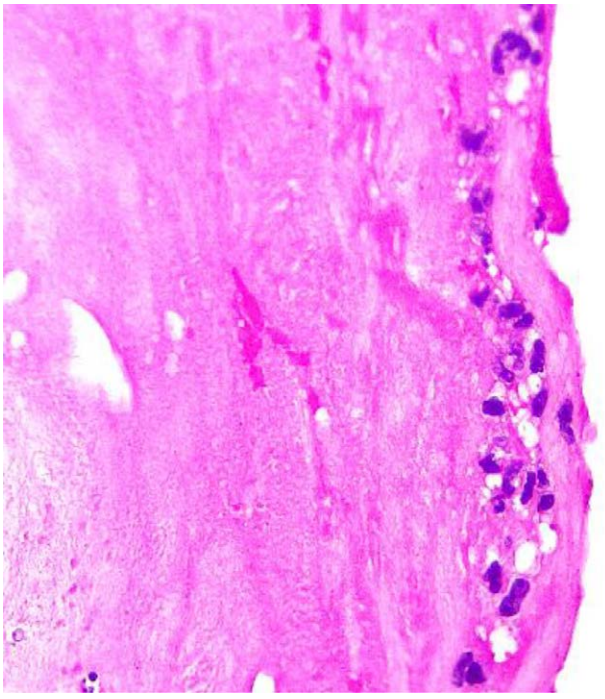

Fig. 4. Atypical lymphoid cells.

eosinophilic cytoplasm, large nuclei, and some mitotic activity that infiltrates but does not pass the capsule completely (Fig. 4).

Immunohistochemical studies showed neoplastic cells with positive CD30 on the internal surface of the mammary capsule. Some cells appeared on the superficial surface without penetrating it. External resection borders without evidence of neoplasm CK, ALK, EMA, and CD38 were negative. CD68 was reactive in some histiocytes. CD20 and CD3 were positive in some cells. KI67 was positive in some neoplastic cells, representing 10%. The right breast showed no CD30 activity. Hematoxylin and eosin stains and immunohistochemistry confirmed ALCL CD30 positive associated to the left breast implant with a T2

stage (neoplastic cells infiltrate superficially the fibrous tissue of the capsule,without invasion), with no evidence of right-side involvement.

The oncologist considered that with the complete resection of the capsule, no other management was required. To date (3 years later), the patient has not presented any recurrence and did not wish to improve the volume of her breasts.

DISCUSSION

According to a 2018 report by the International Society of Aesthetic Plastic Surgery, augmentation mammoplasty with implants is the most frequent cosmetic surgery performed by plastic surgeons: in Colombia, 43,390 cases are performed, and breast reconstruction with implants is done 1486 times a year.[1]

The first report of BIA-ALCL appeared in 1995 as a case series of women with cutaneous T-cell lymphoma associated with breast implants. Subsequently, in 1997, Keech and Creech reported the association of lymphoma with textured breast implants in a patient presenting with a 2-cm mass with diffuse involvement of the breast capsule. In 2011, Carty et al published the first case of a deceased patient with this diagnosis. In 2016, the disease was accepted by the World Health Organization and the National Comprehensive Cancer Network, and guidelines for diagnosis and treatment were established.[2,3] The incidence is reported in one of 30,000 patients with breast implants, although there may be an underreporting.[4]

The etiology is considered multifactorial, and is found to be associated with the use of textured implants and with a time of use greater than 9 years, chronic inflammation, JAK3-STAT mutations, and deregulation of MYC. TP53.[2] The most common clinical presentations are a late seroma, a capsular contracture or mass, axillary lymph nodes, or metastasis.[5–8]

The histological findings are described as large neoplastic cells with epithelioid and pleomorphic characteristics, with abundant cytoplasm, irregular nuclei that are sometimes eccentric with a renal appearance in 70% of cases, and frequent mitoses. The cells are found in periprosthetic fluid and on the internal surface of the capsule, in a "discohesive" form or in groups, accompanied by an inflammatory infiltrate of lymphocytes, histiocytes, and eosinophils.[2,9]

Confirmatory immunohistochemistry studies include tumor markers like CD30, and ALK activity (only positive in some cases). T cells can be expressed as CD4 (80%–84%), CD43 (80%–88%), CD3 (30%–46%), CD45 (36%), and CD2 (30%); or with low levels (or without expression) of CD5, CD7, CD8, and CD15. Up to 80% can be positive for EMA[9]; positive cytokeratin AE1/AE3, BCL2, and high KI67 proliferative index have been described.[2]

For the diagnosis, the most important thing is the depth of the capsular invasion and the compromise of the edges. The National Comprehensive Cancer Network has standardized management in complete capsulectomy, with adjuvant therapies in some cases.[8]

Concern remains if the three implants that the patient had influenced the development of her disease. The Poly Implants Prothèse reported manufacturing problems, with a chronic inflammatory response, and the Mentor and Natrelle (Allergan) prostheses were also related to BIA-ALCL, the latter with more frequency than Mentor. Currently, the Poly Implants Prothèse and Natrelle implants are off the market.[10]

The striking thing about this case is how rare it is that a patient operated on for breast cancer in one breast and prophylactic mastectomy in the other, and reconstructed with implants, develops BIA-ALCL in the prophylactic mastectomy, demonstrating chronic inflammation, and genetic and immunological predisposition of some patients.[11] This should lead us to believe that BIA-ALCL can occur both in cosmetic surgery and in mastectomy with implants, and thereby lead us to have a closer follow-up of our patients.

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