Fat Grafting after Implant Removal Due to Anaplastic Large Cell Lymphoma May Mimic Recurrence

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Breast cancer is the most commonly diagnosed cancer and the second cause of death from malignancy in women. In recent years an association between silicone implants used for breast enhancement or reconstruction and a distinct subtype of anaplastic large T-cell lymphoma was reported. Initially, breast implant-associated anaplastic large cell lymphoma (ALCL) was considered as only anecdotal, but in recent years its recognition has increased dramatically. According to U.S. Food and Drug Administration publications, more than 400 cases have been reported. Nonetheless, knowledge is sparse regarding the pathogenesis, diagnosis, treatment, follow-up, and especially the recurrence characteristics of the disease. We present a woman diagnosed with breast implant-associated ALCL who underwent a bilateral implant and periprosthetic capsule removal that resulted in breast deformity. The fat grafting that was used for reconstruction resulted in breast lumps that were suspected for recurrence of ALCL.

**PATIENT DESCRIPTION**

We previously described a healthy 51-year-old woman 11 years after breast augmentation with Allergan plc (Dublin, Ireland) textured silicone breast implants who was diagnosed with breast implant-associated ALCL [1]. The disease was presented as unilateral swelling of the right breast. Ultrasound examination revealed periprosthetic proteinaceous fluid collection and capsular thickening. Percutaneous fluid aspirations of the periprosthetic fluid showed yellowish serous fluid.

Cytology analysis of the aspirated fluid revealed atypical lymphoid cells suspicious for high grade lymphoma. Cellblock staining revealed that CD3, CD30, and CD45 were positive, while CD4, CD8, CD7, CD20, and ALK1 were negative. T-cell rearrangement was positive and demonstrated monoclonality. G-band analysis revealed a female complex karyotype with multiple structural and numerical abnormalities. SNP array analysis demonstrated multiple copy number alternations as well as copy neutral loss of heterozygosity [1]. The patient underwent bilateral total capsulectomy, in which the capsule and the implants were removed as a whole. On the inner surface of the periprosthetic capsule, a fibrinoid material was observed. The pathology confirmed the diagnosis of anaplastic T-cell lymphoma CD30 positive, ALK1 negative, which was confined to the fibrinoid material next to the prosthesis. She was closely followed every 3 months for 2 years. During the postoperative period there was no clinical, laboratory, or imaging (PET/CT) signs of residual or recurrent lymphoma.

The patient was interested in improving her breast appearance. After consultation, reconstruction using fat grafting was favored. The lower abdomen was selected as a donor site. Fat was injected at three levels: subglandular, breast parenchyma, and subdermal. To the left and right breast, 130 cc and 170 cc of fat were grafted, respectively. Six months after the graft, a small painful lump was felt in the right breast. On clinical examination, a tender palpable mass was found at the upper pole of the right breast. There was no lymphadenopathy or any other pathological findings. On breast sonography, the upper mentioned lesion appeared to be a benign mass. Mammography did not demonstrate any abnormalities. Due to the lack of data regarding the mammographic and sonographic presentation of breast implant-associated ALCL, recurrence an ultrasound guided fine needle aspiration was conducted. The cytology evaluation demonstrated microfragments of fat tissue with no evidence of tumor cells.

**COMMENT**

Breast implant-associated ALCL is a rare disease associated with breast implants. Regardless of whether the implant was used for cosmetic purposes or for post-mastectomy reconstruction, treatment guidelines are the same. According to the guidelines from the National Comprehensive Cancer Network, the surgical management of breast implant-associated ALCL should entail removing the breast implant, periprosthetic malignant effusion, and the periprosthetic capsule, as a whole [2]. Additional chemotherapy or radiotherapy might be indicated for selected cases. After implant removal, the breast may show signs of significant atrophy, emphysematous, and postis, which might cause body image concern. The preferred method of breast reconstruction for such patients is currently under debate in the plastic surgery community. Unfortunately,
conducted at a later date also confirmed the benign nature of the findings.

Due to limited experience with this disease, unjustified imaging modalities and biopsies may be performed to differentiating a post-surgical benign mass from breast implant-associated ALCL recurrence. The case presented here illustrates the knowledge gap regarding recurrence of breast lymphoma associated with breast implants. As more cases of the described malignancy are identified, the number of patients that undergo surgery and associated reconstruction will also increase. Therefore, dilemmas...
regarding treatment and diagnostic options are expected to increase.

CONCLUSIONS
Based on published data, we recommend delaying breast reconstruction for at least 1 year post-treatment of breast implant-associated ALCI. Furthermore, surgeons should be alert to the possibility of recurrence by monitoring seroma, lymphadenopathy, and solid growths in the breast. Although some of these findings may be benign secondary to fat injection, a high degree of suspicion in breast implant-associated ALCI patients is required due to the possibility of recurrence and the variability of its presentation.

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References

Capsule
Brain circuit visualization and manipulation
How are behaviorally relevant representations of the outside world initiated and manifested in the mammalian brain? Marshel and co-authors combined a channelrhodopsin with an improved holographic stimulation technique to examine activity in the mouse visual cortex, including its deep layers. Optogenetic stimulation of neurons previously activated by natural visual stimuli recreated the original activity and behavior. Neuronal population activity typically propagated from cortical layer 2/3 to layer 5 rather than in the reverse direction. Stimulation of a larger number of cells was required to initiate activity in layer 2/3 than in layer 5. This indicates differences in ensemble coding between the two layers.

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Eitan Israeli

Capsule
An appetite for memory
The hippocampus serves a critical role in memory formation and cognition. Hippocampal lesions are among the earliest changes in Alzheimer’s disease (AD); however, the molecular mechanisms responsible for these alterations remain unclear. Using autopic brain samples from patients with AD and a mouse model of AD, Tian et al. showed that in the hippocampus, pathologic $\beta$-amyloid directly binds and inhibits the receptor for the “hunger hormone” ghrelin (GHSR1a). In the animal model, the binding blocked the GHSR1a-mediated dopamine receptor D1 (DRD1) activation, leading to synaptic plasticity impairments and memory loss. Simultaneous pharmacological activation of GHSR1a and DRD1 rescued synaptic plasticity and spatial memory in AD mice.

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Capsule
Changes in bone mineral density after prophylactic bilateral salpingo-oophorectomy in carriers of a BRCA mutation
Kotsopolus et al. addressed the question of what is the association of preventive oophorectomy with bone health in individuals with a BRCA mutation? In this cohort study of 95 women with a BRCA mutation, prophylactic oophorectomy was associated with a decline in bone mineral density, which was most apparent among women who were premenopausal at surgery. The reduction in bone muscle density was as follows: lumber spine: annual change -3.45%, femoral neck: -2.85%, total hip: -2.24%. Use of hormone therapy was associated with less bone loss. Although limited by the small sample size, these findings support targeted management strategies to maintain bone health in this high-risk population.

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