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CASE REPORT
Breast

Primary Squamous Cell Carcinoma Arising from a Breast Implant Capsule

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Summary: Primary squamous cell carcinoma (SCC) of the breast comprises less than 0.1% of all breast cancers. Literature review reveals only 1 reported case of an SCC arising from the capsule of a breast implant. The authors describe, herein, a primary SCC arising from the capsule of a long-standing silicone breast implant. *(Plast Reconstr Surg Glob Open 2015;3:e586; doi: 10.1097/GOX.0000000000000567; Published online 18 December 2015.)*

Primary squamous cell carcinoma (SCC) of the breast is rare, characterized by large tumor size, rapid progression, frequent relapse, and poor prognosis.[1–5] The diagnosis requires 3 conditions to be met: (1) more than 90% of the malignant cells must have squamous differentiation, (2) there are no other primary sites of SCC, and (3) the lesion must be separate from the skin and nipple.[6]

Implant-associated SCC of the breast has only been described once in 1992, although there are several reports of primary breast SCC arising from injection of free silicone.[7–10] In 1999, the Institute of Medicine concluded that there was no evidence to suggest a causal relationship between silicone implants and either autoimmune disease or cancer.[11] This is the first case report of a primary SCC arising from a breast implant capsule since the silicone implant moratorium was lifted.

CASE REPORT

The patient is a 58-year-old otherwise healthy woman who underwent primary bilateral augmentation mammoplasty in the 1980s with silicone implants. She required multiple subsequent procedures for a right-sided capsular contracture, including exchange to saline implants and then back to smooth silicone implants, with concomitant bilateral mastopexy and right-sided subtotal capsulectomy in 2000. Details concerning the brand and style of her implants are not available.

The patient presented to her primary care provider in 2015 with a sudden onset of right breast pain, swelling, and erythema. She was diagnosed with mastitis by her primary care physician and was prescribed antibiotics without any symptomatic improvement. She was subsequently evaluated by her community plastic surgeon. Physical examination revealed 2–3× enlargement of the right breast relative to the left with associated erythema and thinning of the overlying skin. She was taken to the operating room where a 500 mL gray fluid collection with keratinous debris was drained. The implant was intact and was removed from its capsule. A 5-cm fungating mass was noted on the posterior aspect of the capsule. A biopsy was taken and sent for pathology. A drain was placed, and the patient was referred to our tertiary care hospital for further care.

Pathology demonstrated a well-differentiated SCC. A positron emission tomography-computed tomographic scan demonstrated markedly increased F-18 fluorodeoxyglucose uptake localized to the right anterior chest wall (Fig. 1). Further extensive workup ruled out another primary site of SCC.

She underwent right total mastectomy, sentinel lymph node biopsy, and complete capsulectomy with concurrent left explant and simple mastectomy (per patient request). Intraoperatively, a large recurrent

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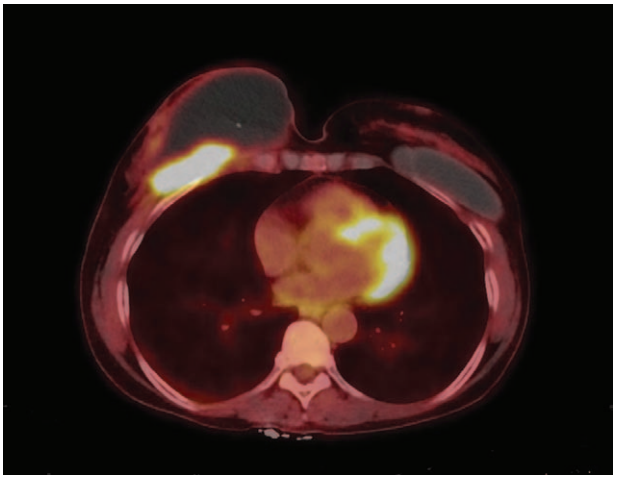

Fig. 1. F-18 fluorodeoxyglucose (FDG) positron emission tomography-computed tomographic study demonstrates an ill-defined hypermetabolic soft tissue lesion located deep to the right breast and along the right anterior chest wall, concerning for neoplastic process. There is a large non-FDG avid fluid density collection in the right breast and overlying the hypermetabolic lesion, likely representing a seroma. Left breast implant is noted. No other suspicious FDG avid lesion or lymph node to suggest systemic involvement of malignancy was identified.

right breast seroma was evident (Fig. 2). The seroma containing keratinous debris was evacuated and sent for cytology. A fungating mass involving the posterior aspect of the subglandular capsule was noted (Fig. 3). To perform *en bloc* resection, portions of the pectoralis major and minor were removed along with the subglandular capsule (Fig. 4). Sentinel lymph node biopsy was transitioned to a complete right axillary lymph node dissection.

The patient was discharged from the hospital on postoperative day 1. Final pathology revealed 2 foci of invasive, moderately differentiated SCC arising from the implant capsule, measuring 5.5 and 3.2 cm. The capsule showed extensive squamous metaplasia and acute and chronic inflammation. The tumors were negative for estrogen receptor, progesterone receptor, and HER2/neu, and 30 lymph nodes were negative for metastatic disease. Cytology was positive for keratinizing SCC.

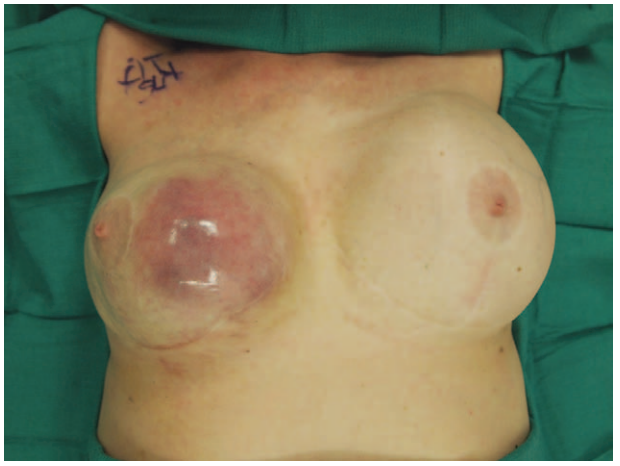

Fig. 2. Intraoperative view of right breast (which has previously been explanted) demonstrating dramatic enlargement with obvious thinning and attenuation of the soft tissue envelope.

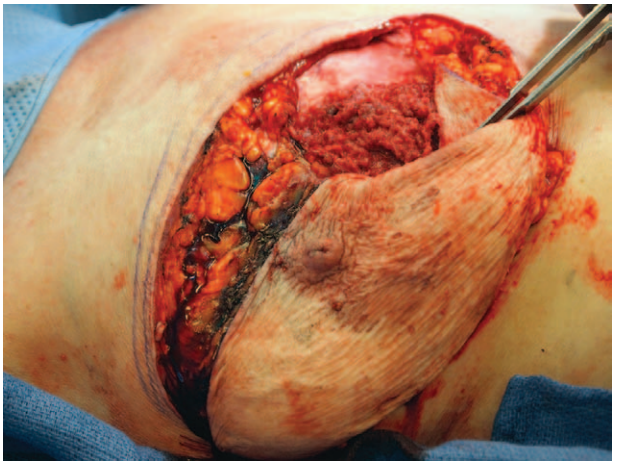

Fig. 3. Intraoperative appearance of in situ posterior capsule.

DISCUSSION

Primary breast SCC accounts for less than 0.1% of all breast cancers, with only 137 reported cases in the United States between 1975 and 2012.[12] Likewise, breast implant-related primary malignancies are also extremely rare, with approximately 112 cases of breast implant-related anaplastic large cell lymphoma and 1 case of primary SCC having been reported in the United States.[7,13]

In a 2010 retrospective review of 434 capsule pathology specimens obtained from 264 patients,

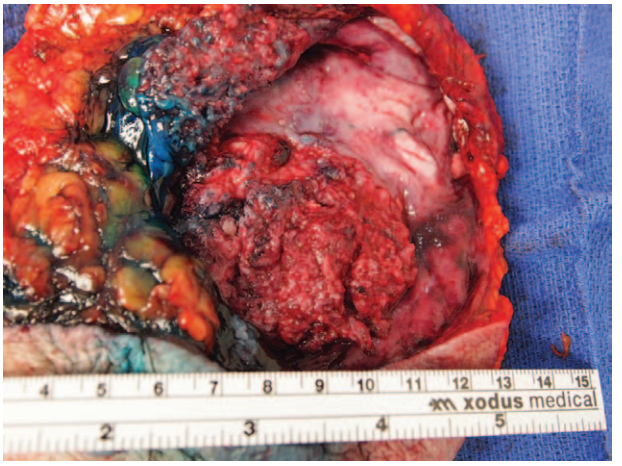

Fig. 4. Mastectomy specimen with visible fungating mass on posterior capsule. Isosulfan blue dye present from aborted sentinel lymph node biopsy.

no new neoplasms or occult disease were discovered. However, all patients that were found to have implant-associated cancers presented with breast pain, enlargement, seroma, and painful capsular contracture outside of the typical postoperative window.[14] The importance of pathological evaluation of implant-related symptoms is underscored by a 2011 consensus panel that provides guidance on managing patients presenting with delayed periprosthetic fluid collections.[15]

The histogenesis of SCC of the breast is unclear. Hypotheses include metaplasia from benign disease of the breast parenchyma, malignant growth of previously quiescent intrinsic epidermal elements (such as an epidermal cyst), or chronic abscess. Malignant squamous transformation is known to develop in wounds involved with chronic inflammation such as osteomyelitis and burns. However, it is unclear how epithelial cells come to reside inside the breast tissue.[16] One hypothesis suggests this may occur at the time of augmentation or reconstruction. However, there is no experimental or clinical evidence to support expected findings of epithelialization of the implant capsule and subsequent squamous dysplasia in capsulectomy pathologic specimens.[17,18] Current study around primary breast implant-associated anaplastic large cell lymphoma, which also presents in similar clinical fashion, may help reveal more information about this issue.[13,19]

CONCLUSIONS

Primary SCC arising from a breast implant capsule is an exceedingly rare occurrence with only 1 previously reported case in the literature. Although the etiology of cancer arising from an implant capsule remains unclear, many hypotheses exist. Practitioners should maintain a high index of suspicion for implant-related cancers in patients who present with delayed breast pain, enlargement, or late seroma.

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