of implant malposition, but few studies have examined risk factors for malposition and no studies to date have directly compared the use of acellular dermal matrix (ADM) and synthetic mesh for correction of implant malposition. We endeavored to identify risk factors for malposition location and compare outcomes by repair technique.

METHODS: Retrospective review of a single surgeon series of implant reconstruction was performed. Variables of interest included age, body mass index (BMI), radiation history, implant size, implant malposition with need for capsulorrhaphy procedure, location of malposition (inferior or lateral), and technique (suture, ADM, or mesh). Binary logistic regression analysis was performed to identify risk factors for implant malposition. Analysis of variance testing was performed to compare success rates by capsulorrhaphy location and technique.

RESULTS: Of 836 breasts, 82 (9.8%) exhibited implant malposition. Risk factors for any malposition were older age (odds ratio [OR], 1.05; 95% confidence interval [CI], 1.02–1.07), BMI <25 (OR, 1.64; 95% CI, 1.00–2.70), and bilateral reconstruction (OR, 13.41; 95% CI, 8.50–21.16). Risk factors for inferior malposition were similarly older age (OR, 1.04; 95% CI, 1.01–1.06), BMI <25 (OR, 3.43; 95% CI, 1.88–6.26), and bilateral reconstructions (OR, 11.50; 95% CI, 6.79–19.49), whereas risk factors for lateral malposition were only older age (OR, 1.05; 95% CI, 1.02–1.08) and bilateral reconstructions (OR, 7.08; 95% CI, 4.09–12.26). Postmastectomy radiation was protective against lateral malposition (OR, 0.30; 95% CI, 0.10–0.88). Implant malposition rates were highest at the extremes of implant volume to BMI ratios (both high implant volume to BMI and low implant volume to BMI). A zone of intermediate implant volume to BMI ratios was identified with significantly lower risk of malposition (1.3% versus 11.2%; P = 0.007). Fifty-eight breasts underwent capsulorrhaphy with ADM (n = 28) or synthetic mesh (n = 35). Sixteen breasts (27.9%) required redo capsulorrhaphy. Capsulorrhaphy failure was more common in ADM compared to mesh repairs (50.0% versus 5.7%; P < 0.001). Older age and ADM use were risk factors for capsulorrhaphy failure (OR, 1.21; 95% CI, 1.03–1.43; and OR, 62.2; 95% CI, 3.24–1,193.84, respectively).

CONCLUSION: This study identifies risk factors for implant malposition after prosthetic breast reconstruction and represents the first direct comparison of ADM versus synthetic mesh for capsulorrhaphy. Risk factors for implant malposition vary by malposition location. Lower BMI increases risk for inferior malposition while radiation is protective against lateral malposition. Regarding repair technique, ADM has higher failure rates compared to synthetic mesh when used for correction of implant malposition in prosthetic breast reconstruction.

Proposed Etiology of Red Breast Syndrome

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**INTRODUCTION:** Despite the well-established benefits of acellular dermal matrix, a poorly defined entity referred to as red breast syndrome has emerged with an incidence of 1.7–14.3%. It is commonly described as a delayed erythema localized on the skin over the acellular dermal matrix (ADM) appearing days to weeks after reconstructive breast surgery without systemic signs of infection. The aim of our study is to clarify the etiology of this phenomenon.1–4

**METHODS:** Patients presenting with RBS without infectious signs following 1- or 2-stage breast reconstruction with implants using ADMs were recruited prospectively between April 2017 and June 2018 as a case series. All reconstructions consisted of subpectoral prosthesis placement with the ADM acting as an inferolateral hammock. We started broad-spectrum antibiotics, admitted for observation and operated for washout of pocket and implant when no clinical improvement was observed in 24 hours of antibiotic therapy. A control group constituted of asymptomatic patients undergoing 2-stage expander with ADM to permanent implant exchange. During surgery, two 1 cm² pieces were collected from the ADMs, one sent for bacterial cultures and the other for scanning electron microscopy. Image analysis of specimens was performed at 3,000× and 6,000× magnifications, including bacterial count and Van Heerden’s semiquantitative biofilm scale.

**RESULTS:** Study group: 9 breasts in 8 patients presented with red breast syndrome. All 9 ADMs utilized were AlloDerm Ready-to-Use (LifeCell Corporation, N.J.) with a size of 16 × 8cm. The mean time-to-onset of RBS was 2.5 weeks in 7 patients and 4 years in 1 patient, whereas the mean time from symptoms to surgical exploration was 4 days. Postoperative cultures revealed commonly found bacteria from skin flora and gastrointestinal tract. Furthermore, biofilm from different bacterial populations was found on all samples on scanning electron microscopy pictures. Control group: 8 breasts were reconstructed with Allergan Biocell expanders. The average size was 490 cm³, and all procedures were done with submuscular insertion assisted by AlloDerm (16 × 8cm). Definitive expander-to-implant exchange occurred between 4 and 16 months after the first stage. Specimens from the implant–ADM interface with...
Biocell expansion had no clinically identifiable “Velcro-effect” or macrotexturing ingrowth but showed a rate of 100% (n = 8) for biofilm formation under electron microscopy.

CONCLUSION: The presence of bacterial biofilm was demonstrated on ADMs in all cases. This suggests that biofilm on ADMs is not always symptomatic. We postulate that bacterial biofilm could be a causative agent of red breast syndrome, but we do not have enough data to propose a “tipping point” which would ultimately cause the syndrome to start.

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Lateral Intercostal Artery Perforator Flap: A Single Surgeon Experience and Review of the Literature for Partial Breast Reconstruction

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BACKGROUND: In 1979, Kerrigan et al described the anatomical locations and potential reconstructive use of the different perforating branches of the intercostal artery. Later, in 1986, Holmstrom et al reported a flap based off the lateral perforating branch of the intercostal artery—the lateral intercostal artery perforator (LICAP) flap—as an option for superolateral breast reconstruction. Since that time, the LICAP flap has been described in cases reports, retrospective reviews, and even a prospective trial. However, a review of the literature has yet to be published. The purpose of this study was to review our institution’s experience and perform a review of the literature.

METHODS: A retrospective review was conducted of a single surgeon’s experience at a major university center. Patients who underwent LICAP flaps between the years of 2007 and 2018 were included. Pre- and postoperative photographs were reviewed, patient demographics were analyzed, and complication rates were determined. A review of the literature was performed on PubMed with search terms “lateral intercostal artery perforator flap” and “lateral thoracodorsal flap,” selecting for articles describing the use of this flap for partial breast reconstruction.

RESULTS: Eleven total patients underwent lateral perforator flaps for reconstruction of segmental mastectomy. Average age was 55 years old. Diagnosis at the time of breast conserving surgery included ductal carcinoma in situ and invasive carcinoma and chronic wound subsequent to radiation therapy. Total excision volume ranged from 3 × 4 × 2 cm to 6 × 6 × 5 cm, from the superolateral breast. The majority of reconstructions were performed in a delayed fashion. No seromas, no delayed healing, nor any need for operative revision were reported. From our literature search, 137 total articles were initially identified. Of these, 38 included information on 1,453 patients who underwent 1,528 laterally based perforator flaps for partial breast reconstruction. Patient age ranged from 23 to 83 years old, with an average reported specimen weight of 160 g and flap dimensions of 15.7 × 6.9 cm. Overall complication rate was low with most complications classified as minor and not requiring surgical intervention. Major complication leading to surgical revision was seen in only 2.57% of flaps. Donor site complications were not common, with seroma the most frequent seen in 3.5% of cases. Diabetes mellitus, thyroid disease, pulmonary and cardiovascular disorders, flap length over 17 cm, smoking, high body mass index, and history of radiation were significantly associated with complications. Additionally, several studies reported good to excellent esthetic outcomes using verified surveys such as SF-36 and the BREAST-Q, and independent review by other plastic surgeons.

CONCLUSION: The LICAP flap presents a robust option for reconstruction of superolateral partial mastectomy defects. It may be performed in a delayed fashion to ensure negative margins at the time of reconstruction and achieves good esthetic outcomes with low risk of complications.

Exploring the Effect of Implant Shell on Patient-derived Breast Implant–associated Anaplastic Large Cell Lymphoma Cells in Ex Vivo Biomimetic Breast Tissue

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