PURPOSE: Implant-based breast reconstruction comprises 75% of all breast reconstructions today. Prompt, accurate diagnosis of breast implant infection is critical to minimizing patient morbidity. The current standard of care, bacterial culture, is falsely negative in 25–30% of untreated patients and substantially more patients receiving antibiotics. A critical need exists for better testing modalities that remain cost-effective. Alpha defensin-1 (AD-1), an antimicrobial peptide released from neutrophils in response to local pathogen invasion, serves as a marker for infection. With sensitivity/specificity of 97% & 96%, it has replaced bacterial culture as the preferred diagnostic modality for orthopedic periprosthetic infection. If AD-1 behaves similarly in periprosthetic breast infections, it may substantially alter practice patterns throughout plastic and reconstructive surgery, with rapid and cheap diagnostic confirmation within 24 hours. We evaluate and compare the diagnostic performance of AD-1 to bacterial culture in suspected periprosthetic breast infection.

METHODS: An IRB-approved prospective study including all adults with prior prosthetic breast reconstruction (expander or implant) and suspected periprosthetic infection requiring operative washout was conducted. Patients missing gram stain and culture data were excluded. Demographics, operative history, prosthetic characteristics, and antibiotic exposure were collected. Implant pocket fluid was sent for gram stain, bacterial culture, AD-1 assay, and surgical pathology. Based upon average sample AD-1 and C-Reactive Protein (CRP) levels, the AD-1 assay reports presence/absence of infection. Sample lactate, human neutrophil elastase, and cell differentials were also collected. Summary statistics and student’s T-test or Fisher tests of association were performed (p<0.05=significant).

RESULTS: 10 breasts with suspected periprosthetic infection met criteria and were included, 7 of which were acutely infected with purulent pocket fluid. Gram stain correctly identified 1 of 7 infections (accuracy-40%) while culture correctly identified 6 of 7 infections (accuracy-90%). AD-1, however, identified all 7 infections (accuracy-100%). AD-1 sensitivity was significantly better than gram stain (100% vs. 14.3%, p=0.02) and more sensitive than culture (100% vs. 85.7%), though the difference was insignificant (p=1.0). Infected breasts averaged higher levels of inflammatory markers (CRP: 15.8 mg/dL vs. 2.9 mg/dL, p=0.08), (lactate: 122 mg/dL vs. 74 mg/dL, p=0.09), both trending towards significance.

CONCLUSION: This prospective study demonstrates the utility of AD-1 in diagnosing periprosthetic breast infection. Combining AD-1 with adjunctive inflammatory markers may allow more accurate and prompt detection of implant infection in order to reduce morbidity and reconstructive failures.

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Trends in Industry Payments to Plastic Surgeons - What does the Sunshine Act Database Tell Us?

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PURPOSE: The purpose of this study was to identify and characterize financial transactions between biomedical companies and plastic surgeons since the implementation of the Sunshine Act.

METHODS: We analyzed payment trends using Physician Payment Sunshine Act (PPSA) data (January 2014–December 2017) to assess industry payments made to plastic surgeons over four years published in the Open Payments Program website.

RESULTS: In 2014, $26,709,248 was paid to 5,316 plastic surgeons; the median (IQR) was $255 (101–660) and mean (SD) was $5,024 (± 133,531). In 2015, $19,653,379 was paid to 5,366 plastic surgeons; the median (IQR) was $298 (110–861) and mean (SD) was $3,662 (± 67,915). In 2016, $21,544,043 was paid to 5,308 plastic surgeons; the median (IQR) was $286 (107–894) and mean (SD) was $4,058 (± 68,607). In 2017, $23,066,378 was paid to 5,384 plastic surgeons; the median (IQR) was $238 (88–726) and mean (SD) was $4,284 (± 93,185). The highest payments by payment category were made for royalties and licensing fees: $13,806,934 in 2014 to 20 plastic surgeons; $6,974,734 in 2015 to 20 plastic surgeons; $7,224,323 in 2016 to 22 plastic surgeons; and $9,168,129 in 2017 to 24 plastic surgeons. The second highest payment category was speaker fees:
$4,976,016 in 2014 to 253 plastic surgeons; $4,425,901 in 2015 to 295 plastic surgeons; $3,956,768 in 2016 to 246 plastic surgeons; and $5,110,970 in 2017 to 201 plastic surgeons. The third highest payment category was consulting fees: $2,932,708 in 2014 to 292 plastic surgeons; $2,746,140 in 2015 to 293 plastic surgeons; $3,500,132 in 2016 to 332 plastic surgeons; and $3,891,218 in 2017 to 461 plastic surgeons. For four consecutive years Allergan was the highest paying company.

CONCLUSION: While the PPSA has been implemented to provide transparency to patients regarding industry’s payments to physicians, its implementation was fraught with speculation that payment trends would change. The 2014–2017 PPSA data demonstrate that there have been minimal changes in payments trends to plastic surgeons over the past four fiscal years.

Prepectoral Direct-to-Implant Breast Reconstruction: Safety Outcome Endpoints and Delineation of Risk Factors

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PURPOSE: Immediate implant-based breast reconstruction is the leading technique for post-mastectomy reconstruction. Although implants are generally placed beneath the pectoralis major muscle, recent developments have allowed for implant placement above the muscle in a prepectoral plane. In fact, prepectoral breast reconstruction has been shown to mitigate complications associated with subpectoral breast reconstruction, including animation deformity and discomfort. Still, few studies have reported long term outcomes of prepectoral implant placement in the context of direct-to-implant (DTI) breast reconstruction. This study aimed to compare safety outcome endpoints between prepectoral and subpectoral DTI reconstruction. We hypothesized that prepectoral DTI breast reconstruction is a safe alternative to subpectoral DTI breast reconstruction.

METHODS: Retrospective chart review at a tertiary academic medical institution identified 115 patients who underwent prepectoral DTI reconstruction and 142 patients who underwent subpectoral DTI reconstruction over a 5-year period. Univariate analysis was performed to compare patient characteristics between both cohorts. A penalized logistic regression identified relationships between postoperative complications and covariate variables in each group.

RESULTS: A binomial regression model revealed that prepectoral DTI breast reconstruction is associated with lower risk of surgical site infection (p = 0.04) and lower risk of revision (p = 0.01) when compared to subpectoral DTI breast reconstruction. Rates of capsular contracture, explant, skin necrosis, and hematoma were comparable between groups.

CONCLUSION: This study compared the safety outcomes and risk factors in prepectoral and subpectoral DTI reconstruction patient cohorts. These findings support the hypothesis that prepectoral DTI breast reconstruction is a safe alternative to subpectoral DTI breast reconstruction, where the analysis revealed that patients who underwent prepectoral DTI reconstruction experienced lower rates of surgical site infection. It is speculated that the significant difference in surgical site infection may be due to decreased procedure time of the prepectoral procedure, or decreased dissection with preservation of the pectoralis major muscle and vascular network. Prepectoral DTI patients also presented with significantly lower rates of revision when compared to subpectoral DTI patients. Ultimately, this study demonstrated that prepectoral DTI breast reconstruction has a favorable safety profile when compared to subpectoral DTI reconstruction. Prospective study of prepectoral DTI is in progress to collect patient reported outcomes to further delineate safety and efficacy of this breast reconstruction approach.

Decreasing Opiate Use in Plastic Surgery: Does Use of Preoperative Bilateral Thoracic Paravertebral Blocks for Breast Reduction Surgery Reduce Opiate Exposure?

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