Cost of P4HB mesh was approximately $14/cm² compared to $25/cm² for ADM (44% less expensive).

**CONCLUSIONS:** These data show biosynthetic P4HB mesh to be a safe alternative to ADM in expander-based breast reconstruction, with trends toward decreased rates of infection and need for device removal using P4HB mesh. There was also a trend toward decreased infection rates in P4HB patients that were not radiated. Although our results are limited to a small series of initial patients, P4HB porous mesh may be a promising novel technique to decrease complications inherent to use of ADM.

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**Long-Term Satisfaction in Young Reduction Mammaplasty Patients: a 30 Year Follow-Up Using the Breast-Q**

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**PURPOSE:** Reduction mammoplasty is the most effective means of improving symptomatic macromastia. Although studies have shown lasting improvement in middle-aged patients, there is a paucity of data regarding young patients. With the growing obesity epidemic, more young patients are requesting reduction mammoplasty, signifying a need for long-term outcomes data. We hypothesize that young reduction mammaplasty patients experience excellent long-term quality of life and overall satisfaction.

**METHODS:** Female patients less than 25 years of age who underwent reduction mammaplasty by a single surgeon from 1980–2004 were identified (n = 134). Contact information was obtained for 52 patients, for which 47 consented to participate. These patients were then mailed BREAST-Q Post-Operative Reduction Module surveys. Completed surveys were scored on a scale of 0–100 using the Qscore software. Demographic characteristics, comorbidities, surgical details, and length of follow-up were also reviewed.

**RESULTS:** Thirty-six surveys were returned (response rate: 76.6%). The average age at surgery was 20.2 years (range: 12.4–24.6 years), with a mean follow-up of 21.2 years (range: 11.4–32.4 years). The mean BMI at surgery was 29.2. The inferior pedicle reduction technique was used in all cases. For satisfaction domains, mean scores were as follows: breasts, 66.9; outcome, 78.1. Regarding quality of life domains, mean scores were as follows: psychosocial, 76.1; sexual, 72.8; physical, 81.0. BMI <25 at the time of surgery was not a statistically significant predictor of long-term satisfaction or well-being.

**CONCLUSION:** This study provides the longest follow-up of young reduction mammaplasty patients, and it is the only study to use the validated BREAST-Q in this population. Compared to normative values, young reduction mammaplasty patients more than ten years out from the procedure demonstrated higher scores across all domains. Surgeons should be aware of these data and advocate for their young patients to gain access to care.

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**Implant-Based Breast Reconstruction and the Timing of Adjuvant Radiotherapy: A Systematic Review and Meta-Analysis of Surgical Outcomes**

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**PURPOSE:** Implant-based breast reconstruction is the most common type of reconstruction. Outcomes of breast reconstruction are worse following post-mastectomy radiation therapy (PMRT), however, the impact of factors like timing, duration and dosage remain poorly understood. The impact of the timing of PMRT relative to the course of reconstruction is perhaps one factor that can be potentially modified by reconstructive surgeons. The systematic review aims to evaluate surgical outcomes following implant-based reconstruction in the setting of PMRT.

**METHODS:** A systematic review of the English literature published from 2000 to 2016 in the PubMed/MEDLINE electronic database was performed to identify all manuscripts reporting outcomes of implant-based breast reconstruction in patients receiving PMRT. Patients in each study were grouped by timing of PMRT relative to reconstructive
course; whether radiotherapy was administered to a tissue expander or permanent implant. Primary outcomes of interest were the most major of complications: reconstructive failure and capsular contracture. Overall rates and associations were determined via established methods; effect sizes (z-values), risk ratios (RRs), and heterogeneity scores (I²) were calculated on meta-analysis using a random and fixed effect models.

**RESULTS:** Twenty studies met our inclusion criteria for a total of 2,348 patients undergoing implant-based breast reconstruction treated with PMRT. Five studies (25%) were performed prospectively while the remaining 15 (75%) were performed retrospectively. Most studies represented Level III evidence (16/20, 80%). The remaining minority was equally comprised of Level II (2/20, 10%) and Level IV studies (2/20, 10%). Mean follow-up was 39.5 months with a minimum average of 14.5 months and a maximum average of 73.5 months. Mean time to tissue expander exchange for permanent implant was 10.1 months in the 12 studies reporting this information. Pooled analysis of all patients revealed a rate of reconstructive failure of 17.5% and a rate of Baker grade III/IV capsular contracture of 37.5%. Overall, compared to patients receiving PMRT to permanent implants, patients who had PMRT applied to tissue expanders experienced higher rates of reconstructive failure (20% vs. 13.4%, p=0.001), but lower rates of capsular contracture (24.5% vs. 49.4%, p=0.0001). Meta-analysis demonstrated consistent findings by revealing a large effect size of 1.82 (RR=1.99, 95% CI 0.95–4.20) for reconstructive failure and a smaller effect size of -0.34 (RR=0.87, 95% CI 0.39–2.00) for capsular contracture.

**CONCLUSION:** Regardless of timing, PMRT applied to implant-based breast reconstruction was associated with an unacceptably high risk of adverse events. Surgeons should strongly consider alternative methods of breast reconstruction, such as autologous-based reconstruction, as an alternative for patients who will require radiotherapy as part of their treatment protocol.
Whole-Brain Intrinsic Connectivity in Nonsyndromic Craniosynostosis

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PURPOSE: Nonsyndromic craniosynostosis (NSC) has been associated with a greater risk of neurocognitive aberrations such as learning disorders, memory and attention deficits, and visuospatial abilities. Previously, our group has performed resting-state functional MRI (fMRI) studies in patients with sagittal NSC (SSO), and has found altered functional connectivity that may underlie some of the neurocognitive deficits in these patients. This study seeks to determine if different forms of NSC, including metopic synostosis (MSO) and unilateral coronal synostosis (UCS), result in different aberrations of functional brain connectivity.

METHODS: Twenty participants (average age 11.6 years, standard deviation 2.27, 15 males, 5 females) with surgically-treated NSC (10 sagittal, 5 metopic, 5 right unilateral coronal) were recruited from the Yale Craniofacial Clinic and individually matched to controls by age, gender, and handedness. Resting-state functional MR imaging was acquired in a 3T Siemens Tim Trio MR system (Erlangen, Germany) while patients focused on a black digital display with a 1-inch white plus sign. Data was corrected for movement using SPM (University College London), underwent CSF and WM signal regression, and was registered to Montreal Neurological Institute (MNI) space. Whole-brain intrinsic connectivity was analyzed using BioImage Suite (Yale School of Medicine) and resulting group-level t-maps were cluster-corrected for multiple comparisons at FWER p<0.05 (voxel-level threshold p<0.01, k ranging from 20 to 23).

RESULTS: For NSC groups versus controls, SSO demonstrated significantly decreased connectivity in left Brodmann areas (BA) 7, 40 and 9, corresponding to the superior parietal lobule and the dorsolateral prefrontal cortex (DLPFC). MSO had significantly decreased connectivity in the left BA 8, which is also a part of the DLPFC. UCS demonstrated decreased connectivity in left BA 10 (anterior prefrontal cortex, APFC), but had increased connectivity in the right caudate nucleus. When comparing between NSC groups, there were no significant differences between SSO and MSO or UCS and MSO. However, SSO did demonstrate decreased connectivity in left BA 8 and 9 compared to UCS.

CONCLUSION: Intrinsic connectivity analysis demonstrated significantly altered functional connectivity in NSC that varied by suture type. The SSO group demonstrated significant changes in the left supramarginal gyrus, which may correspond to some of the language and learning disorder findings known to occur in this group by neurocognitive testing. This corroborates previous fMRI findings seen in SSO, but now at a more robust significance level. The MSO group did not show changes in the parietal cortex, instead demonstrating significant changes in the DLPFC; this area plays a crucial role in executive functions like working memory and abstract reasoning. Finally, the UCS group was the only form of NSC that demonstrated significantly altered connectivity in the APFC, which has a presumed role in multi-tasking. Neurocognitive testing in previous studies has largely focused on sagittal patients or has not differentiated between different forms of NSC. Thus, it is uncertain how different forms of NSC can lead to differing neurocognitive or behavioral phenotypes. This study is the first to provide evidence of differences in neural activity in NSC patients based on type of synostosis.