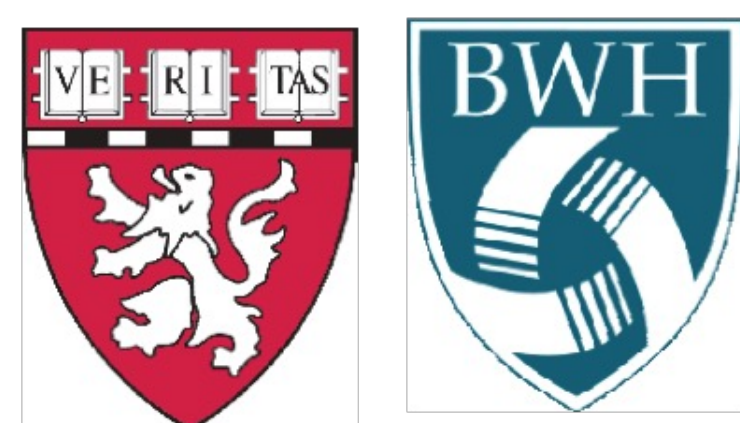


Comparison Of Nipple-Sparing Mastectomy Versus Skin-Sparing Mastectomy In Bilateral Implant-Based Breast Reconstruction With Unilateral Radiotherapy: A Matched Cohort Study



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PURPOSE:

Nipple-sparing mastectomy (NSM) preserves natural nipple-areola complex and entire native breast skin with a goal of superior cosmetic outcomes in breast reconstruction. However, in bilateral tissue expander (TE)/implant-based reconstruction requiring unilateral post-mastectomy radiotherapy (PMRT), radiation-induced fibrosis can cause progressive nipple asymmetry and cosmetic dissatisfaction. Thus, PMRT may ultimately negate the intended positive cosmetic value of NSM compared to skin-sparing mastectomy (SSM). We aimed to compare 1) surgical complications, 2) patient satisfaction, and 3) aesthetic outcomes of NSM vs. SSM in bilateral implant-based reconstruction with unilateral PMRT.

METHODS:

We conducted a retrospective matched cohort study of consecutive NSM patients with (TE)/implant breast reconstruction and unilateral PMRT, matched 1:2 to SSM patients. All patients completed PMRT and TE exchange to implants. We collected demographic, oncologic, co-morbidity, and complication data, and evaluated patient satisfaction using the BREAST-Q questionnaire. Aesthetic outcome was assessed by blinded reviewers using a 5-point Likert scale, ranging from “Excellent,” “Excellent/Good,” “Good,” “Fair,” and “Poor.”

RESULTS:

Among 58 patients who underwent bilateral TE/implant reconstruction with unilateral PMRT, 17 NSM patients were matched to 41 SSM patients by age, BMI, co-morbidities, and smoking status. No significant difference existed between overall surgical complications ($p=0.2$) and BREAST-Q questionnaire scores. However, aesthetic outcomes demonstrated a higher total average aesthetic score in the SSM group compared to NSM.

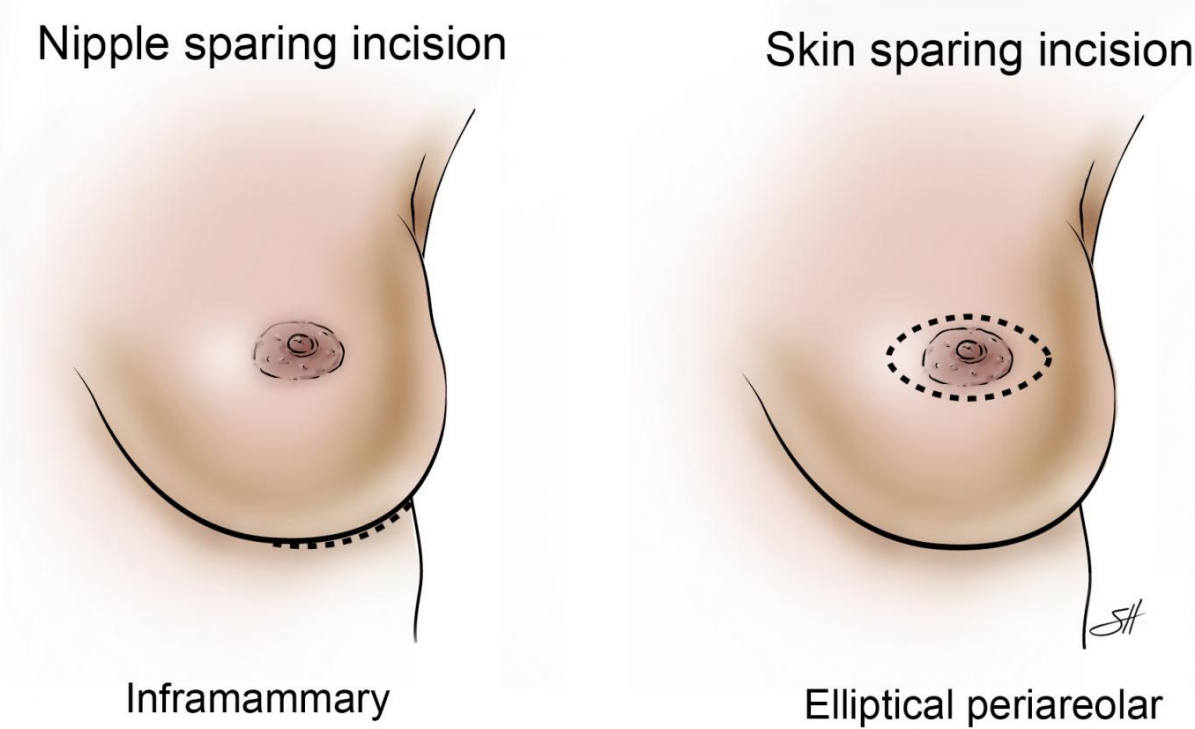


Figure 1: An illustration depicting a nipple sparing mastectomy (NSM) incision vs. a skin sparing mastectomy (SSM) incision. Credit: Scott C. Holmes

Results

Table 1. Demographics

Predictor Variables	Nipple-Sparing Mastectomy (n=17)	Skin-Sparing Mastectomy (n=41)	p-value
Age	39 ± 9 years	40 ± 7 years	0.7
Height (cm)	165 ± 6 cm	163 ± 7 cm	0.4
Weight (kg)	61 ± 6 kg	63 ± 7 kg	0.5
BMI	22.5 (1.8)	23.5 (2.0)	0.069
Hypertension	0/17 (0%)	1/41 (2.4%)	>0.9
Smoker Status			0.3
Never Smoked	16/17 (94%)	30/41 (73%)	
Previously Smoked	1/17 (5.9%)	9/41 (22%)	
Current Smoker	0/17 (0%)	2/41 (4.9%)	
Breast Cancer Stage			0.6
1	4/17 (24%)	6/35 (17%)	
2	9/17 (53%)	22/35 (63%)	
3	3/17 (18%)	7/35 (20%)	
4	1/17 (5.9%)	0/35 (0%)	
Neoadjuvant Chemotherapy	9/17 (53%)	26/41 (63%)	0.6
Adjuvant Chemotherapy	15/17 (88%)	24/41 (59%)	0.034
Explant to Implant (Days)	421 ± 153 days	379 ± 141 days	0.3
Other Surgery			0.8
ALND	7/17 (41%)	20/41 (49%)	
Specimen Weight (Left) L	297 ± 125 L	424 ± 182 L	0.006
Weight (Right) g	281 ± 137 g	397 ± 174 g	0.012

Table 1: Demographics, including preoperative and intraoperative variables, were compared between the NSM and SSM cohorts. There were no significant differences except for a higher frequency of adjuvant chemotherapy in the NSM group, and a higher specimen weight in the SSM group.

Table 2. Complications

Complication	Nipple-Sparing Mastectomy (n=17)	Skin-Sparing Mastectomy (n=41)	p-value
Hematoma Requiring Intervention	0/17 (0%)	1/39 (2.6%)	>0.9
Infection	2/17 (12%)	4/41 (9.8%)	>0.9
Wound Dehiscence	1/17 (5.9%)	0/39 (0%)	0.3
Necrosis	5/17 (29%)	5/40 (12%)	0.15
Explantation of TE	0/17 (0%)	3/41 (7.3%)	0.5
Unplanned Reoperation	2/17 (12%)	2/41 (4.9%)	0.6
Explantation of Implant	1/17 (5.9%)	0/39 (0%)	0.3

Table 2: Complication rates were similar between NSM and SSM cohorts.

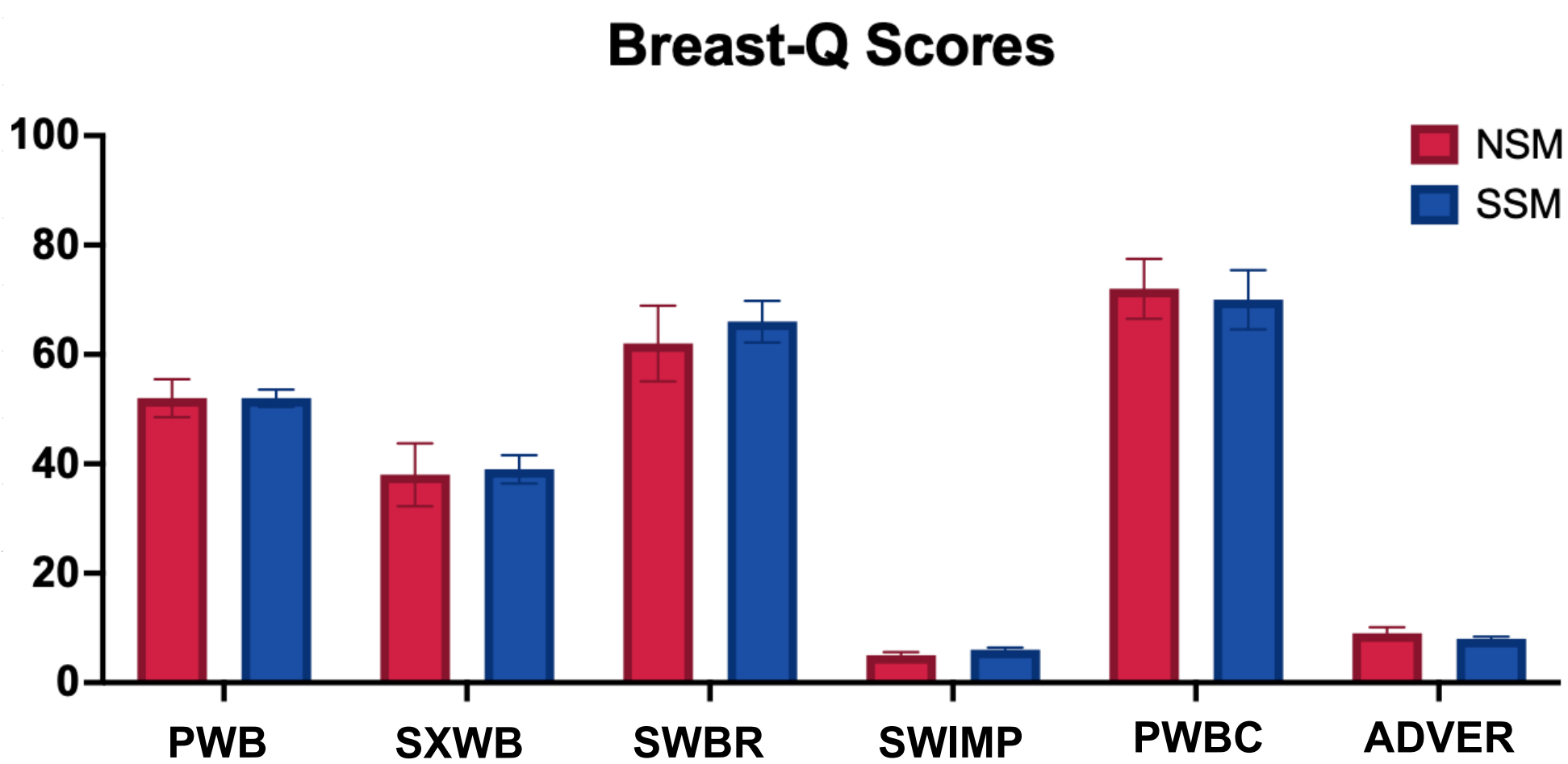


Figure 2: Patients were asked to complete the Reconstruction (Postoperative) BREAST-Q module. A total of 25 patients from the SSM cohort and 12 patients from the NSM cohort completed surveys. There were no significant differences found between cohorts in any of the module scores.

PWB= Psychosocial Well-Being, SXWB= Sexual Well-Being, SWBR= Satisfaction with Breasts, SWIMP= Satisfaction with Implants, PWBC= Physical Well-Being: Chest, ADVER= Adverse Effects of Radiation.

Statistical Analysis

- Welch two sample t-test used to compare NSM vs. SSM Breast-Q scores, blinded aesthetic ratings
- The “mean sum score” of the aesthetic ratings was calculated by the sum of all five blinded raters per subject
- Analyses found no significant differences between Breast-Q scores but a significantly higher aesthetic rating in the SSM cohort compared to NSM cohort ($p=0.029$)

Results

Aesthetic Outcomes

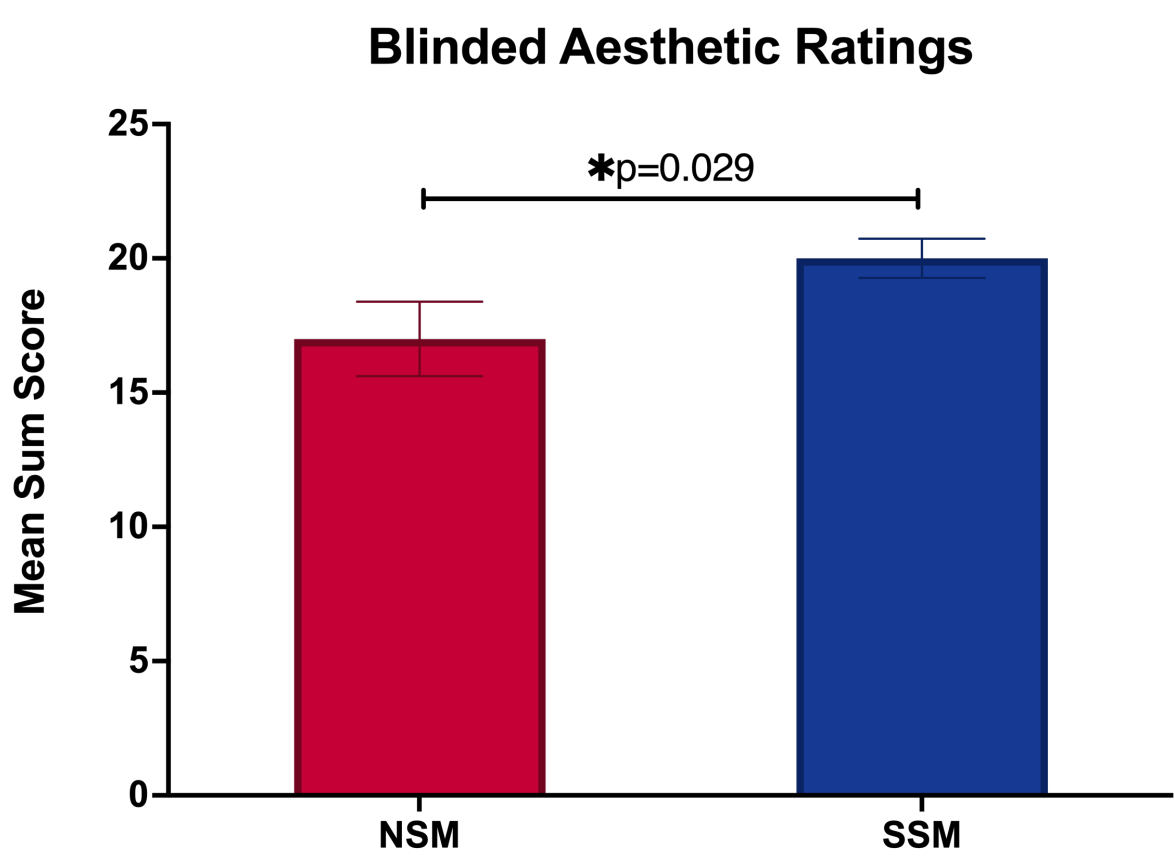


Figure 3: Blinded reviewers were asked to rate standardized 1-year post-operative photos, taken after completion of PMRT and 2nd stage TE exchange to implant procedure.

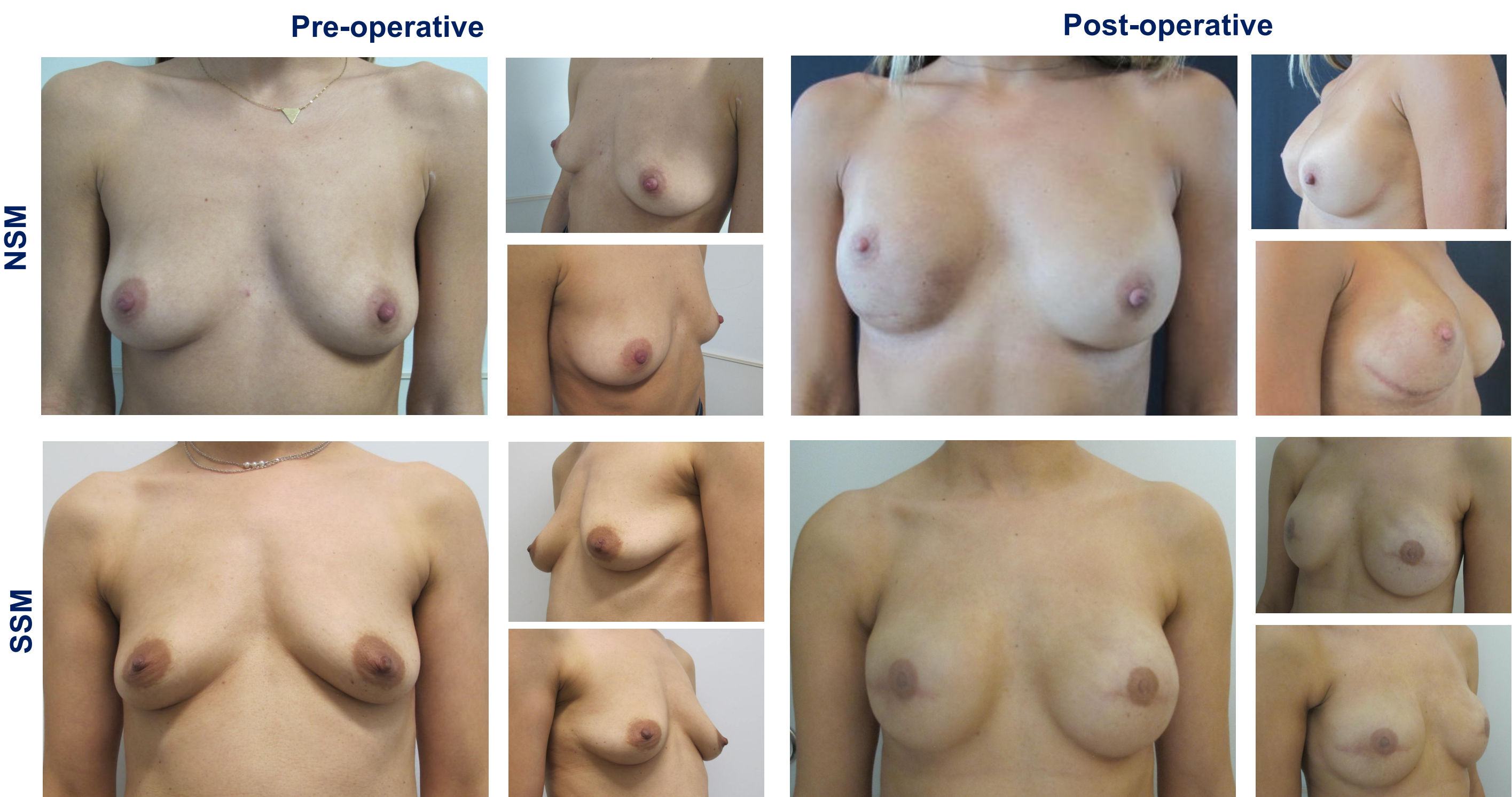


Figure 4: Examples of standardized pre-operative and post-operative photos. Blinded reviewers were asked to rate post-operative photographs from five angles: frontal view, each lateral side, and each side at 45-degree angles. Note: Only frontal and 45-degree angles shown here.

CONCLUSIONS:

Although NSM is generally associated with superior cosmetic outcomes compared to SSM, it has far less impact in bilateral implant-based breast reconstruction with unilateral PMRT due to the negative post-radiotherapy effect on nipple symmetry. Therefore, SSM may be a more suitable option to achieve optimal aesthetic outcomes in this setting.