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High-Risk Lesions in Reduction Mammoplasties in Patients of Hispanic Ethnicity: Incidence and Follow-up

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ABSTRACT

Background: Occult high-risk breast lesions are occasionally detected in reduction mammoplasty specimens, but data in Hispanic patients are scarce.

Methods: We retrospectively reviewed bilateral reduction mammoplasties performed for macromastia from January 2018 to June 2020 and from January to May 2023 at an academic center serving a predominantly Hispanic population. Self-identified Hispanic patients without prior breast cancer or known high-risk lesions were included. Demographic, clinical, histopathologic, and follow-up data were analyzed.

Results: Of 333 Hispanic patients, 21 (6.3%) had incidental high-risk lesions: atypical ductal hyperplasia (n=9), atypical lobular hyperplasia (n=4), atypical lobular hyperplasia approaching lobular carcinoma in situ (n=3), lobular carcinoma in situ (n=4), and atypical ductal hyperplasia bordering on ductal carcinoma in situ (n=2). Patients with high-risk lesions were older (median, 50 vs 38 years) and more likely to have a family history of breast or ovarian cancer (38.1% vs 15.7%). Logistic regression confirmed age (odds ratio [OR], 1.05 per year) and family history (OR, 3.41) as independent predictors. Mean follow-up was 3.9 years; 2 patients (10.5%) developed invasive carcinoma, while most (71.4%) entered high-risk surveillance, and 19% initiated chemoprevention.

Conclusions: Among Hispanic women undergoing reduction mammoplasty, 6.3% had occult high-risk lesions—similar to rates in predominantly non-Hispanic cohorts. Older age and family history significantly increased the risk. Routine histopathologic evaluation of all reduction specimens remains essential, with incidental high-risk findings prompting enhanced surveillance and preventive interventions.

INTRODUCTION

Reduction mammoplasty is performed to relieve symptoms related to breast hypertrophy. It is a common surgery, and in 2023, the American Society of Plastic Surgeons reported 76 031 breast reduction procedures (aesthetic patients only).[1] For patients with macromastia, it provides significant improvement in physical symptoms such as neck, shoulder, and back pain as well as improvement in psychosocial well-being.[2] The age range of patients is wide, from elderly to adolescence, with 46% of patients younger than 40 years.[1] Recommendations for breast imaging prior to reduction mammoplasty include screening mammograms for patients aged 40 years and older; hence, close to 50% of patients are not recommended for breast imaging prior to reduction surgery.[3]

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The incidence of occult high-risk breast lesions found during pathologic examination of reduction mammoplasties ranges from 0.06% to 12.8% in reported series.[4] These include precancerous lesions such as atypical hyperplasia, carcinoma in situ, and invasive carcinoma. Clinicopathologic factors associated with significant pathologic findings in reduction mammoplasties include older age, personal prior history of breast cancer, and family history of breast cancer.[5–8] Findings of occult significant lesions in reduction mammoplasties are almost always unexpected and often lead to changes in clinical patient management, which can include further breast imaging, additional surgery, chemoprevention, or enhanced clinical follow-up.[9]

White patients comprise the overwhelming majority of individuals undergoing cosmetic breast surgeries, including reduction mammoplasty, in the United States. Recent data suggest that only about 13% of all cosmetic surgery patients identify as Hispanic, while the vast majority are non-Hispanic White.[1,10] As a result, most existing publications examining the incidence and outcomes of high-risk breast lesions in reduction mammoplasty specimens are based predominantly on White cohorts, with limited representation of Hispanic patients.[4] This underrepresentation is particularly concerning given the distinct sociodemographic, genetic, and health care access factors that may influence breast cancer risk and detection in Hispanic populations.[11,12] Our study aims to address this critical gap in the literature by documenting the incidence and clinical impact of occult high-risk lesions in reduction mammoplasty specimens, specifically among Hispanic women. By raising awareness of this issue, we hope to inform more equitable and culturally sensitive surveillance strategies for high-risk breast lesions in diverse patient populations.

METHODS

This retrospective cohort study was conducted at Montefiore Medical Center/Albert Einstein College of Medicine, an academic institution serving an underserved, inner-city population with a high proportion of Hispanic patients. Institutional Review Board (IRB) approval was obtained prior to study initiation. The requirement for informed consent was waived by the IRB for this retrospective study.

The institutional pathology database was searched for all bilateral reduction mammoplasties performed for symptomatic macromastia between January 1, 2018, and June 30, 2020, and again between January 1, 2023, and May 31, 2023. No elective reduction mammoplasties were performed during the intervening period due to COVID-19 restrictions. Non-Hispanic patients were excluded, as the study objective was to specifically evaluate Hispanic women. Additional exclusion criteria included prior breast cancer, prior high-risk breast lesions, or preoperative suspicion of malignancy. Surgical technique and pathology processing did not change between the 2 study periods, and no demographic differences were observed between the cohorts; therefore, the 2 intervals were combined without stratification.

All specimens were processed in accordance with departmental standard operating procedures. For patients younger than 40 years, 3 sections were submitted from each breast with particular attention to nonfatty tissue. For patients aged 40 years or older, 6 sections were submitted from each breast with particular attention to nonfatty tissue. All reduction mammoplasty specimens were reviewed by board-certified pathologists using standard hematoxylin-eosin–stained sections. Cases identified as high-risk lesions were further evaluated using immunohistochemical studies when appropriate and/or underwent independent review by a second board-certified pathologist. Final diagnoses were rendered based on consensus interpretation. This confirmatory approach, routinely employed in clinical breast pathology practice, was used to reduce diagnostic variability and mitigate interobserver differences inherent to histopathologic assessment of atypical breast lesions.

Demographic and clinical variables extracted included age, body mass index (BMI, kg/m^2), family history of breast or ovarian cancer, and preoperative imaging findings. Preoperative breast imaging findings were reviewed when available. Histologic findings from reduction mammoplasty specimens were assessed for the presence of high-risk ductal or lobular lesions, including atypical ductal hyperplasia (ADH), ductal carcinoma in situ (DCIS), atypical lobular hyperplasia (ALH), and lobular carcinoma in situ (LCIS). There were no cases of invasive carcinoma found in the reduction mammoplasty specimens in this study. Follow-up data included postoperative surveillance strategies (e.g., MRI or routine mammography), the use of endocrine-based chemoprevention, the development of invasive breast carcinoma, and the duration of clinical follow-up.

The primary outcome was the incidence of high-risk lesions in reduction mammoplasty specimens from Hispanic patients. Secondary outcomes included the association of high-risk lesions with age, BMI, and family history of breast or ovarian cancer, as well as subsequent changes in clinical management and cancer outcomes. Statistical comparisons between patients with and without high-risk lesions were performed using Wilcoxon rank sum tests for continuous variables and χ^2 tests for categorical

variables. Logistic regression was used to identify factors associated with the odds of having high-risk lesions in reduction mammoplasty specimens. The linearity of continuous variables in the log odds (or logit) was evaluated using the Box-Tidwell test. Variables were selected a priori based on clinical relevance and prior literature. Given the limited number of outcome events, the final model was restricted to age and family history of breast or ovarian cancer to minimize overfitting. Data were analyzed using SAS, version 9.4 (SAS Institute Inc). A P value < 0.05 was considered statistically significant.

RESULTS

A total of 608 bilateral reduction mammoplasty procedures performed for macromastia were identified during the study period. Of these, 333 patients (54.8%) self-identified as Hispanic ethnicity and were included in the final analysis.

Among the 333 Hispanic patients, 21 cases (6.3%) showed occult high-risk lesions on histologic examination of reduction mammoplasty specimens. These lesions were incidental findings, as all surgeries were performed for macromastia with no known preoperative suspicion of malignancy.

The distribution of the 21 high-risk lesions identified in the reduction mammoplasty specimens included 9 cases of ADH, 4 cases of ALH, 3 cases of ALH approaching LCIS, 4 cases of LCIS, and 2 cases of ADH bordering on DCIS. Notably, 1 patient had both LCIS and ADH.

The median (IQR) age of patients with high-risk lesions was 50.0 (44.0–54.0) years, compared with 38.0 (26.5–51.5) years in those without high-risk lesions ($P = 0.005$). The median (IQR) BMI was 30.4 (28.7–33.1) in the high-risk group and 31.2 (28.1–34.5) in the no high-risk lesion group ($P = 0.56$). A family history of breast or ovarian cancer was reported in 8 of 21 patients (38.1%) with high-risk lesions vs 49 of 312 patients (15.7%) without such lesions ($P = 0.008$) (Table 1).

Table 1. Demographic and Clinical Characteristics of 333 Hispanic Patients Undergoing Reduction Mammoplasty, Stratified by Presence of High-Risk Lesions

Characteristic	No high-risk lesions (n = 312)	High-risk lesions (n = 21)	*P* value
Age, median (IQR), y	38.0 (26.5–51.5)	50.0 (44.0–54.0)	0.005
BMI, median (IQR)	31.2 (28.1–34.5)	30.4 (28.7–33.1)	0.56
Family history of breast or ovarian cancer, No. (%)			0.008
No	263 (84.3)	13 (61.9)	
Yes	49 (15.7)	8 (38.1)	

BMI, body mass index; IQR, interquartile range.

In logistic regression analysis, increasing age was independently associated with higher odds of the presence of high-risk lesions after adjustment for family history of breast or ovarian cancer (OR per year, 1.05; 95% CI, 1.01–1.09; $P = 0.008$) (Table 2). Similarly, after adjustment for age, a family history of breast or ovarian cancer was associated with higher odds of high-risk lesions (OR, 3.41; 95% CI, 1.32–8.85; $P = 0.012$). BMI was not retained in the final model because it was not considered a confounder, as it was not associated with either the independent variables (age and family history of breast or ovarian cancer) or the outcome (high-risk lesions).

Table 2. Multivariable Logistic Regression Model of Factors Associated with High-Risk Lesion Identification in Reduction Mammoplasty Specimens

Factor	Odds ratio (95% CI)	*P* value
Age, per year	1.05 (1.01–1.09)	0.008
Family history of breast or ovarian cancer		
Yes	3.41 (1.32–8.85)	0.012
No (Reference)	1 [Reference]	

CI, confidence interval.

Preoperative breast imaging was available for 18 of the 21 patients (85.7%) with high-risk lesions identified on reduction mammoplasty. Imaging modalities included mammography with or without adjunct ultrasound, based on patient age and clinical indication. Among patients with available imaging, Breast Imaging Reporting and Data System (BI-RADS) categories were BI-RADS 1 in 7 patients, BI-RADS 2 in 10 patients, and BI-RADS 3 in 1 patient. Three patients did not undergo preoperative imaging;

1 was 20 years old and did not meet routine screening criteria, while 2 patients older than 40 years did not have documented preoperative imaging in the medical record. Among patients younger than 40 years who did undergo imaging, one 39-year-old patient had a BI-RADS 3 assessment, and one 30-year-old patient had a BI-RADS 1 assessment. No patients had BI-RADS 4 or 5 findings preoperatively.

Of the 21 patients with high-risk lesions, 4 (19%) were started on tamoxifen for chemoprevention, and 15 (71.4%) were enrolled in high-risk screening programs. Two patients lacked follow-up due to relocation outside the health system catchment area, resulting in unavailable postoperative records. Follow-up data were available for 19 of the 21 patients (90.5%), with a mean follow-up duration of 3.9 years (range, 1–6 years). Among these, 2 patients (10.5%) developed invasive breast carcinoma. One patient (aged 67 years) with ADH bordering on DCIS identified in a reduction specimen was diagnosed with invasive breast carcinoma within 2 months postoperatively in the same location. The second patient (aged 20 years), who had bilateral ADH in reduction specimens, developed invasive breast carcinoma 2 years after surgery, and genetic counseling was recommended. The remaining 17 patients (89.5%) were alive and had no evidence of disease at the time of the last follow-up.

A detailed summary of all 21 patients with high-risk lesions—including age, family history, histologic findings, management strategy, and follow-up outcome—is provided in Table 3.

Table 3. Clinical Characteristics, Pathology Findings, Preoperative Imaging, and Follow-Up Outcomes of 21 Patients with High-Risk Lesions Identified in Reduction Mammoplasty Specimens

Age, y	Family history of breast/ovarian cancer	Pathology in reduction mammoplasty	Management	Follow-up
30	Yes	Markedly atypical ductal hyperplasia bordering on DCIS	MRI	NED 6 y
55	No	ALH	Routine screening	NED 2 y
52	Yes	ADH	Not available	Not available
50	No	LCIS	Tamoxifen, MRI	NED 5 y
56	Yes	ADH	Routine screening	NED 5 y
58	No	ALH approaching LCIS	MRI	NED 5 y
44	No	ALH	Tamoxifen, MRI	NED 5 y
53	No	ADH	MRI	NED 5 y
48	No	LCIS, ADH	Tamoxifen, MRI	NED 2 y
54	Yes	ALH approaching LCIS	MRI	NED 5 y
40	No	ALH approaching LCIS	Not available	Not available
46	No	ADH	MRI	NED 5 y
45	No	LCIS	Tamoxifen, MRI	NED 5 y
51	No	ADH	MRI	NED 5 y
20	No	ADH bilateral	MRI	Invasive cancer in 2 y
49	No	LCIS	MRI	NED 1 y
67	Yes	ADH bordering on DCIS	MRI	Invasive cancer in 2 mo
50	Yes	ADH bilateral	Not available	Not available
56	Yes	ALH	Routine screening	NED 1 y
42	No	ALH	MRI	NED 1 y
39	Yes	ADH	MRI	NED 1 y

ADH, atypical ductal hyperplasia; ALH, atypical lobular hyperplasia; BI-RADS, Breast Imaging Reporting and Data System; DCIS, ductal carcinoma in situ; LCIS, lobular carcinoma in situ; MRI, magnetic resonance imaging; NED, no evidence of disease.
[a]BI-RADS classification was available for most patients; imaging was unavailable or undocumented in 3 cases.

DISCUSSION

In this retrospective cohort of Hispanic women undergoing reduction mammoplasty, we identified a 6.3% incidence of occult high-risk breast lesions, comparable to rates reported in predominantly non-Hispanic populations. However, our findings highlight several clinically relevant considerations unique to this cohort. High-risk lesions were more frequently identified in older patients and those with a family history of breast or ovarian cancer, and the majority were not detected by preoperative imaging. These observations emphasize the importance of thorough histopathologic evaluation of reduction mammoplasty specimens, particularly in Hispanic women who may have limited access to routine breast screening.

Breast cancer incidence among Hispanic women in the United States is notably lower than that observed in non-Hispanic women, with age-adjusted rates of approximately 99.2 per 100 000 for Hispanic women compared with 133.7 per 100 000 for non-Hispanic women.[13] Despite this lower incidence, Hispanic women are more likely to be diagnosed at a younger age and with more advanced-stage disease.[11]

Several factors may contribute to these disparities, including differences in reproductive patterns, lower rates of mammographic screening, higher prevalence of obesity, and barriers to health care access.[11,14–18] Additionally, Hispanic women are underrepresented in breast cancer research and clinical trials, which limits our understanding of their unique genetic and environmental risk factors. Tumor biology may also differ; for example, some studies suggest a higher prevalence of hormone receptor–negative and ERBB2 (formerly HER2)–positive subtypes among Hispanic women, which are associated with poorer outcomes.[16] Socioeconomic challenges and limited access to timely, high-quality care may further compound these disparities, resulting in lower survival rates despite the overall lower incidence.[12,15] These differences highlight the need for targeted research and culturally sensitive interventions to improve breast cancer outcomes in Hispanic populations.

Although Hispanic women in the United States have a lower reported incidence of breast cancer compared with non-Hispanic White women, they remain underrepresented in breast cancer research and may face unique risk factors.[11,13] Hispanic women in the US tend to have higher rates of obesity, which is a known risk factor for postmenopausal breast cancer.[18,19] However, in our cohort, the median BMI among Hispanic patients with high-risk lesions was similar to that of those without such lesions, suggesting that BMI alone may not fully account for the presence of these lesions. We found that older age and family history of breast or ovarian cancer were significantly associated with increased odds of identifying high-risk lesions. Specifically, for each additional year of age, the odds of finding a high-risk lesion increased by 5% (OR, 1.05), and patients with a family history were over 3 times as likely to harbor a high-risk lesion (OR, 3.41). These findings reinforce prior reports and support the utility of routine pathologic evaluation of reduction mammoplasty specimens, especially in older women and those with a positive family history. For patients with a family history of breast or ovarian cancer, consideration should be given to imaging prior to reduction mammoplasty at an age younger than 40 years.

Genetic factors may also play a role; for instance, certain protective variants such as 6q25 are more common in Hispanic women and are associated with a lower breast cancer risk, while high-penetrance mutations like *BRCA1/2* are less prevalent compared with other groups.[15,19] Additionally, there is evidence that tumor biology and disease progression can differ by race and ethnicity, as seen in Black women who experience faster progression from DCIS to invasive cancer.[20] Whether Hispanic women exhibit similar differences in the natural history of high-risk lesions remains unclear. It is interesting that despite the lower incidence of breast cancer in Hispanic women, the incidence of high-risk lesions in reduction mammoplasties in our cohort was similar to that reported in prior studies. One hypothesis is that disease progression may be slower in Hispanic women compared with other ethnicities, an issue that warrants further investigation. These observations highlight the importance of vigilant pathological assessment and tailored follow-up for Hispanic women, even in populations traditionally considered at lower risk for breast cancer.

Historically, the primary focus of care for patients undergoing reduction mammoplasty has been symptom relief rather than cancer surveillance, and there are no standardized guidelines for the pathological evaluation or follow-up of high-risk lesions found incidentally in this context.[4,16] When an incidental high-risk lesion is found, this can establish an entry point for enhanced surveillance or other risk-reducing strategies, which may enable earlier detection of malignancy and more personalized risk-reduction strategies.[20,21] This is particularly relevant for Hispanic women and other populations in low-resource, inner-city environments, who already face significant barriers to breast cancer screening and specialty care.[11,14] By leveraging the surgical encounter as a point of entry into high-risk surveillance programs (e.g., MRI screening, chemoprevention), we can help bridge gaps in access and potentially improve long-term outcomes for a group that is both medically underserved and at risk of being overlooked in traditional cancer prevention models.[15] Our data demonstrate that high-risk lesions are found in patients with negative or benign preoperative imaging, highlighting the value of vigilant pathological assessment in all reduction mammoplasty cases, regardless of perceived baseline risk.

Limitations

Limitations of our study include the small sample size and limited follow-up duration. Additionally, follow-up data were unavailable for 2 of the 21 patients. It is also important to note that the category of Hispanic ethnicity encompasses a diverse population with origins from many different countries; our cohort consisted exclusively of Hispanic patients from the Bronx, which may limit the generalizability of our findings. Furthermore, for data from patients with surgery dates between January 1, 2023, and May 1, 2023, the available follow-up was limited, which may affect the completeness of outcome assessment. Nonetheless,

our study has several strengths. All cases were reviewed by subspecialty breast pathologists at an academic institution, where patients have access to high-risk programs and ongoing follow-up. Furthermore, given that our patient population is predominantly Hispanic, we were able to examine a relatively large and focused cohort within this ethnic group. During the same study period, non-Hispanic patients at our institution had similar age distributions and imaging availability; however, they were excluded from the analysis because the study aim was focused on Hispanic women. This helps ensure internal validity but may limit generalizability.

CONCLUSION

In this retrospective study of Hispanic patients undergoing reduction mammoplasty for macromastia, we identified a 6.3% incidence of occult high-risk breast lesions—comparable to rates reported in the general population. These findings were more common in older patients and those with a family history of breast or ovarian cancer, and they were not detected by preoperative imaging. Importantly, the discovery of these lesions prompted significant changes in clinical management, including enhanced surveillance and chemoprevention, and in some cases led to early diagnosis of invasive carcinoma. Our results highlight the value of histopathologic evaluation of reduction mammoplasty specimens and underscore the need to include underrepresented populations, such as Hispanic patients, in breast cancer risk assessment and prevention strategies.

ETHICAL CONSIDERATIONS

Not applicable.

DATA AVAILABILITY

None.

CONFLICT OF INTERESTS

The authors declare no conflicts of interest.

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AI DISCLOSURE

The authors confirm that no artificial intelligence (AI) tools were used at any stage of this study, including the writing or language editing of the manuscript. The work was conducted entirely by the authors, who take full responsibility for its content.

AUTHOR CONTRIBUTION

HKG: Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. S: Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. PO: Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. YL: Formal analysis, Writing – original draft, Writing – review & editing. BU: Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. FNS: Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. SAF: Conceptualization, Methodology, Data curation, Formal analysis, Investigation, Supervision, Writing – original draft, Writing – review & editing.

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