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PRS GLOBAL OPEN

ORIGINAL ARTICLE
Breast

Inferior Breast Pole Dermal Flap: A 7-year Experience

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Background: The use of an inferior breast pole dermal flap for implant support in breast reconstruction is a reconstructive option with particularly favorable results in patients with macromastia and/or ptosis. The purpose of this study was to analyze the outcomes of Hispanic patients and compare them with those in the existing literature.
Methods: This observational study was conducted using a single surgeon's database. The study included female patients with macromastia and/or ptosis who underwent skin-sparing breast reconstruction using an inferior dermal flap for implant support. Variables obtained included patient demographics, history of chemotherapy or radiotherapy, degree of ptosis, brassiere size, size of initial tissue expander, final implant size, number of expansions, and complications.
Results: A total of 202 women met the inclusion criteria; 136 underwent bilateral reconstruction and 66 underwent unilateral reconstruction. All patients underwent immediate reconstruction, 180 (89.1%) underwent 2-stage reconstruction, and 22 (10.9%) underwent 1-stage reconstruction. No significant trend was observed among those who went directly to implant and those who had tissue expander placement. The majority of patients had ptosis grade III (47.8%). Between 2017 and 2023, there were a total of 22 complications (10.9%), with the most common being infection (3.5%). Forty-two patients received radiotherapy, of which only 5 developed complications.
Conclusions: Breast reconstruction with an inferior breast pole dermal flap is a safe and feasible option, with minimal complications in Hispanic patients with ptosis and macromastia. *(Plast Reconstr Surg Glob Open 2025;13:e6686; doi: 10.1097/GOX.0000000000006686; Published online 14 April 2025.)*

INTRODUCTION

Several surgical options are currently available for breast reconstruction after a mastectomy. The decision on which reconstructive method to use depends on the location and type of tumor; extent of resection; need for postmastectomy radiotherapy (PMRT); the patient's risk factors; availability of local and distant donor tissue; desired size and shape of the reconstructed breast; and, most importantly, the patient's preference.[1–4] The inferior dermal flap technique for implant support in breast reconstruction was first described by Bostwick et al in 1990. He described a single-stage reconstruction with a permanent implant placed beneath a combined pectoralis muscle/deepithelialized dermal pocket, covered with a Wise-pattern skin closure.[1,2,4] The deepithelialized inferior skin flap has proven favorable owing to its well-vascularized barrier, resulting in decreased wound healing complications and improved aesthetic outcomes, specifically in patients with macromastia and ptosis.[4–6]

The availability of effective breast reconstructive options for Hispanic patients is of utter importance, given the fact that Hispanic patients are more likely to be diagnosed with breast cancer at a younger age and with more aggressive disease, for which breast-conserving therapy may not be an option.[7] Further, previous literature has highlighted that Hispanic patients may experience higher complication rates following PMRT.[8] These patients, therefore, benefit from being offered breast reconstructive options with a lower risk of complications.

Our study investigates the possible benefits of using an autologous dermal flap for implant support. Proposed benefits of this technique include lower complication rates due to the dermal flap having its own blood supply, the implant pocket being well-vascularized, and the implant having double coverage because the dermal flap is covered by a skin flap.[5,6,8] Further, because the inferior pole is used

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Received for publication August 15, 2024; accepted February 14, 2025.

DOI: 10.1097/GOX.0000000000006686

Disclosure statements are at the end of this article, following the correspondence information.

as a hammock connecting it to the pectoralis muscle, the subpectoral space available to place the implant/tissue expander (TE) is larger (Fig. 1). This allows a greater volume at the initial fill, rendering fewer expansions and decreasing the time from the first procedure to final reconstruction with the implant. Finally, owing to the design, if a unilateral breast is reconstructed, the inverted T design helps create symmetry with the contralateral side when a lift or reduction is indicated (Fig. 1). We postulate that this technique is a feasible reconstructive option for Hispanic patients with macromastia and/or ptosis.

Takeaways

Question: What cost-effective breast reconstruction options can be offered to Hispanic patients with macromastia and/or ptosis?

Findings: Breast reconstruction with an inferior breast pole dermal flap is a safe and feasible option with minimal complications for Hispanic patients with ptosis and macromastia.

Meaning: An inferior breast pole dermal flap can be safely offered to patients with underlying macromastia and ptosis who are undergoing breast reconstruction.

METHODS

This multicenter retrospective medical chart review was performed using a single plastic surgeon database from 2017 to 2023. The study included female patients with macromastia and/or ptosis who underwent skin-sparing breast reconstruction using an inferior dermal flap. Data obtained included age, medical history, use of adjuvant or neoadjuvant chemotherapy or PMRT, ptosis degree (using Regnault classification), brassiere size, size of the initial TE (if used), size of the final implant, number of expansions, and complications.

Descriptive statistics, including frequencies, percentages, and mean, minimum, and maximum values, were used to characterize the study population. Cross-tables were constructed to compare each characteristic with at least 1 complication. Differences were analyzed using the Welch 2-sample *t* test for numeric variables and the Pearson chi-square test for categorical variables. Variables that had levels with frequencies less than 6 were analyzed using the Fisher exact test. Generalized linear models were created to evaluate the association between ptosis grade and brassiere size with final implant size (mL) and expansion volume (mL). In these models, the intercept represents the mean of the group that constitutes the reference level for all categorical variables and the betas represent the difference between the mean of each level and the mean of the reference level for each variable. The association between the ptosis grade and final implant size (mL) with 1-stage reconstruction was also assessed using generalized linear models. In these models, the odds ratios represent the odds of being in each level compared with the reference level of each category.

Statistical analysis was performed using R, version 4.3.2 (R Foundation for Statistical Computing) and R-Studio Integrated Development Environment for R (Posit Software, PBC). Statistical significance was set at a *P* value of less than 0.05. All models were adjusted for age.

RESULTS

Demographics

In total, 202 women met the inclusion criteria. Ages ranged from 30 to 75 years, with an average being 51.9. The degree of ptosis was documented, with grade III being more frequently seen in 96 (47.8%) patients, followed by grade II in 75 (37.3%) patients. The most common brassiere size was 36C, ranging from 32A to 46DDD. Seventy-eight (38.6%) patients had a family history of breast

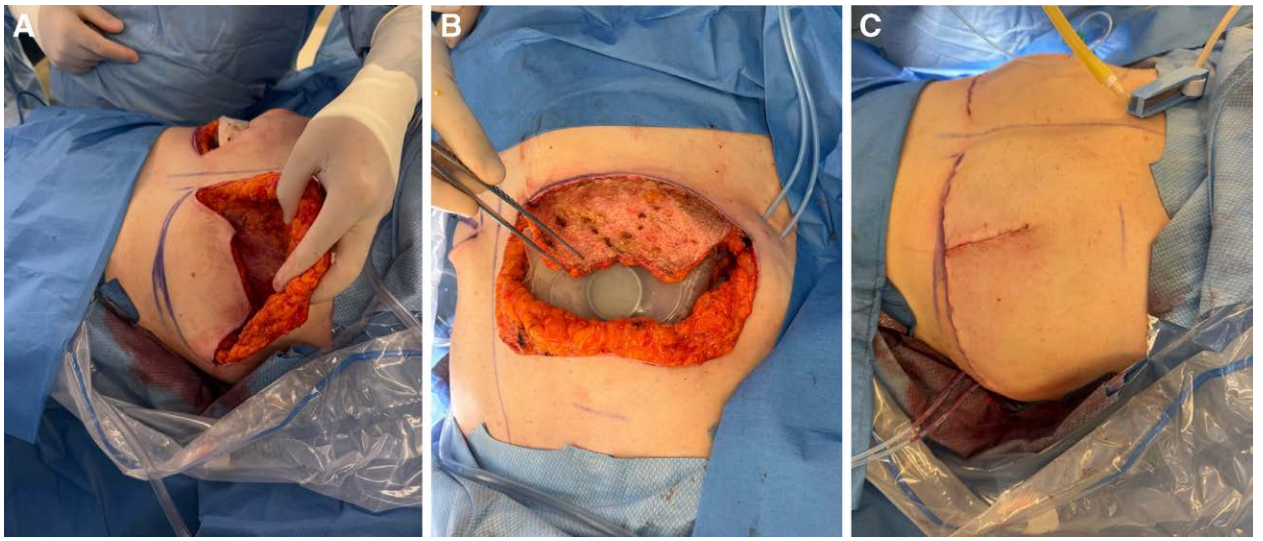

Fig. 1. Depiction of process for an inferiorly based breast dermal flap reconstruction. A, Implant/TE pocket and dermal flap before deepithelization. B, Demonstration of dermal flap support of TE. C, Final intraoperative result of Wise-pattern incision.

Table 1. Demographics and Clinical Data for All Patients

Characteristic	Overall, N = 202*	Characteristic	Overall, N = 202*
Age, y	51.9 (30.0–75.0)	Dermal flap laterality	
Smoker (N = 201)	20.0 (10.0)	Bilateral	136.0 (67.3)
Brassiere size		Unilateral left	29.0 (14.4)
32	5.0 (2.5)	Unilateral right	37.0 (18.3)
34	34.0 (16.8)	Procedure type	
36	82.0 (40.6)	Implant	22.0 (10.9)
38	47.0 (23.3)	TE	180 (89.1)
40	21.0 (10.4)	Stages for reconstruction	
42	8.0 (4.0)	1	22.0 (10.9)
44	4.0 (2.0)	2	180.0 (89.1)
46	1.0 (0.5)	Genetic markers	
Brassiere cup		BRCA1	2.0 (1.0)
A	2.0 (1.0)	BRCA2	15.0 (7.4)
B	28.0 (13.9)	Chak2	1.0 (0.5)
C	87.0 (43.1)	None	184.0 (91.1)
D	60.0 (29.7)	Additional treatment	
DD	19.0 (9.4)	Radiotherapy	42.0 (20.8)
DDD	6.0 (3.0)	Chemotherapy	25.0 (12.4)
Ptosis degree (N = 201)			
None	7.0 (3.5)		
I	19.0 (9.5)		
II	75.0 (37.3)		
III	96.0 (47.8)		
Pseudoptosis	4.0 (2.0)		

*n (%); mean (range).

Table 2. Complication Summary

Characteristic	N = 202*
Complications	22.0 (10.9)
Infection	7.0 (3.5)
Hematoma	3.0 (1.5)
Fat atrophy	3.0 (1.5)
Implant removal	3.0 (1.5)
Contracture	3.0 (1.5)
Minimal dehiscence	2.0 (1.0)
Asymmetry/ptosis	1.0 (0.5)

*n (%).

cancer, and BRCA2 was the genetic mutation most commonly found in our participants (15, 7.4% patients). Forty-two patients received PMRT (20.8%), whereas 25 received chemotherapy (12.4%). Other data related to patient characteristics were collected and are presented in Table 1.

Of the 202 patients, 136 underwent bilateral reconstruction and 66 underwent unilateral reconstruction. All patients underwent immediate reconstruction: 180 (89.1%) received TE placement, whereas 22 (10.9%) went directly to implant. Most patients underwent 2-stage reconstruction (89.1%). Complications were recorded to evaluate outcomes within our single-surgeon cohort and assess possible risk factors. Between 2017 and 2023, there were a total of 22 complications (10.9%), with the most common being infection (3.5%). Infections were defined as cellulitis or wound suppuration. Other reported complications included hematoma formation, fat atrophy, implant loss, contracture, minimal dehiscence, defined as less than 1 cm of dehiscence, and asymmetry/ptosis (Table 2).

Reconstruction Approach

All the patients included in our study underwent an inferior dermal flap approach with either TE (89.1%) or implant reconstruction (10.9%). Of these, 136 underwent bilateral surgery, either at the first or second stage, and 66 underwent unilateral reconstruction. In this reconstruction approach group, no significant trend was observed for patients who had TEs versus those who went straight to the implant. Additionally, no significant association was evident between the degree of ptosis and 1- or 2-stage reconstruction. The decision to opt for this approach was made after careful consideration and discussion between the surgeon and the patient. The results following reconstruction are shown in Figure 2.

Implant Size

In patients who underwent TE placement, the mean initial TE volume was 288 mL. In terms of final implant volume, those who went straight to the implant had a mean volume of 457 mL, whereas those who underwent expansion had a mean volume of 454 mL. Only 1 patient had subsequent volume expansion after the initial fill. There was no significant association between the final implant mean volume and procedure type. In addition, having a 1-stage reconstruction did not show a significant association with larger or smaller implants. However, patients with brassiere sizes of 38 and 40 had a greater mean final implant size ($P = 0.049$ and 0.009, respectively) than patients with a brassiere size of 32. Patients with a brassiere cup size DD had a greater expansion volume mean size than patients with cup size A ($P = 0.011$).

The degree of ptosis was recorded to evaluate the possible relationship between the expansion process and the

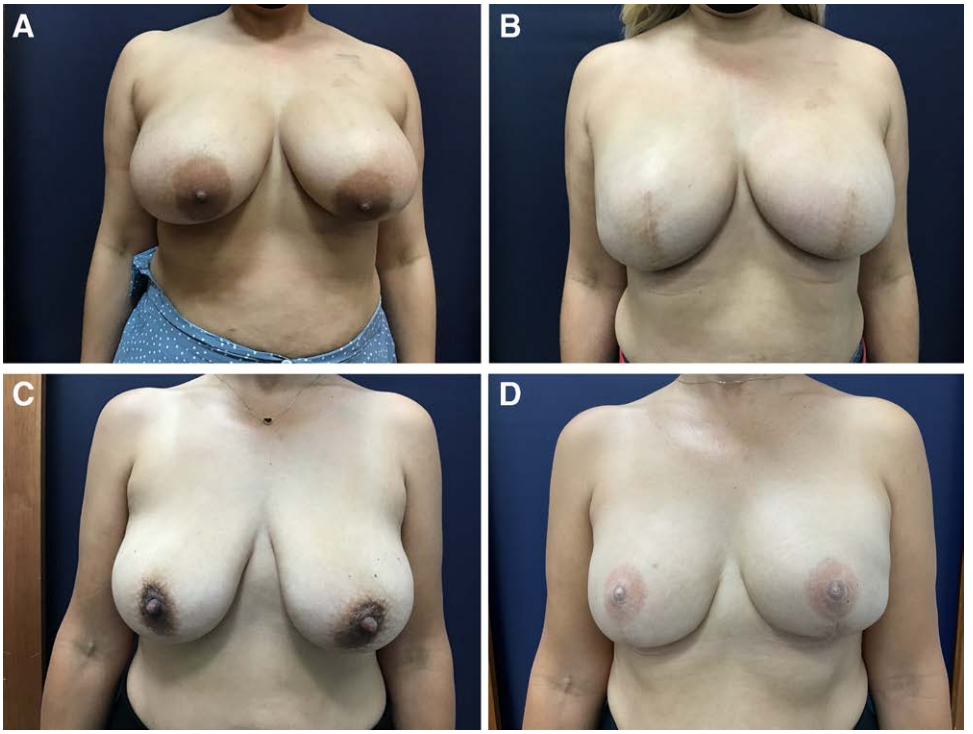

Fig. 2. Appearance of breast reconstruction in female patients preoperatively (A, C) and postoperatively (B, D).

final implant size. Most of the participants had grade III ptosis (47.8%), which was found to have greater expansion volume mean size compared with those without ptosis (P = 0.027). Nevertheless, no association was found between the degree of ptosis and the final implant size.

Complications

During the 7-year period, 22 complications were encountered, with infection being the most common (n = 7), followed by hematoma, fat atrophy, implant loss, and contracture (n = 3 each). There was no statistically significant difference in complications between the TE and immediate implant reconstruction groups. Moreover, larger breasts or a higher grade of ptosis were not significantly associated with complications. An increased risk of complications was evident in patients with asthma (P = 0.015). Among the patients who received PMRT, 5 developed complications (11.9%). Neither smoking nor age were associated with complications. Nonetheless, it is important to note that we require smoking cessation pre- and postoperatively, which may explain the lack of complications in those who identified as smokers preoperatively. The summary of complications is shown in Figure 3.

DISCUSSION

Choosing a reconstruction technique for female patients with breast cancer represents an important step in the treatment plan, which incorporates key factors including aesthetic outcomes and financial considerations. Skin-sparing mastectomy with an autologous inferior dermal flap has proven to be a feasible option for patients with large ptotic breasts without the economic burden of an acellular dermal matrix (ADM).[9] The well-vascularized deepithelialized inferior tissue pedicle offers an extra layer of protection to the implant in case of skin necrosis.[4–6] In addition, the subpectoral space created by suturing the autodermal flap to the pectoralis muscle is larger, allowing for 1-stage reconstruction or placement of a TE with a larger initial volume. In terms of breast aesthetics, the definition of the inframammary fold is superior, which allows lower pole fullness. Our study seeks to reinforce the fact that the use of an inferior dermal flap for implant support is a feasible reconstructive option for Hispanic patients.

The degree of ptosis and larger brassiere sizes help develop a larger autodermal flap, thereby increasing the likelihood of a 1-stage reconstruction or fewer filling sessions of the TE. Our data suggest that a wide variety of ptosis (I–III) and brassiere sizes (32A–46DDD) could be amenable to this type of reconstruction. This allows the inferior breast pole dermal flap to be a safe approach for a select group of patients with these characteristics. This seems to be a limited option for patients with a smaller breast size.

The majority of the participants had a bra size of 36C and grade III ptosis. Given the nature of this, most patients underwent a 2-stage reconstruction (10.9% 1-stage versus 89.1% 2-stage), with initial filling volumes of 175–500 mL, and eventual final implant sizes ranging from 275 to 775 mL. Only 1 patient underwent more than 1 expansion session, indicating that patients were able to complete the reconstruction process in a shorter period of time. In fact, recent studies have identified inferior

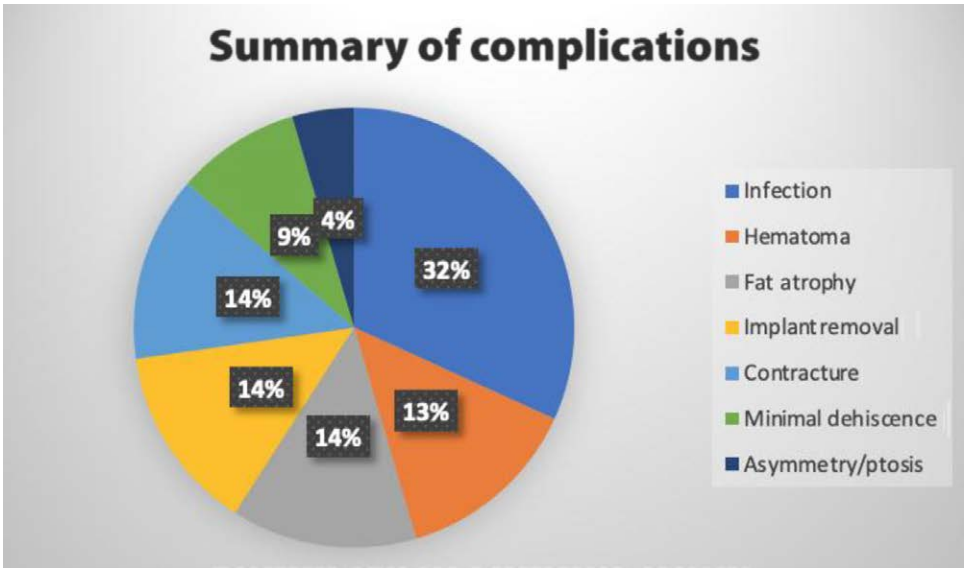

Fig. 3. Summary of complications.

dermal flap reconstruction as a safe and effective option even for single-stage reconstructions, as also observed in our population.[10]

When deciding the best reconstruction approach for each patient, surgeons must consider possible complication risks. In our study, we found that out of 202 women who underwent the inferior dermal flap approach, only 22 developed at least 1 complication. Infection was the most prevalent during the study period. These patients were treated with antibiotics, and those whose infection did not resolve eventually required implant or TE removal. The incidence of other complications, such as hematoma and dehiscence, remained low ($n \leq 3$).

Capsular contracture rates in subpectoral breast reconstructions using ADMs have been documented to be as high as 8.2%.[11] In our cohort, the capsular contracture rate was 1.5%, which may suggest a lower probability of capsular contracture with the use of an inferior dermal flap for implant support as opposed to an ADM. Nonetheless, further research is necessary to determine the possible causes of the lower incidence of capsular contracture.

Patient follow-up consisted of weekly appointments up to 6 weeks postoperatively, followed by an appointment at 90 and 180 days. After this, all patients are seen yearly, allowing for necessary surveillance of long-term complications. Nonetheless, a limitation of our study includes a lack of long-term follow-up for patients undergoing surgery after 2022.

Regardless of the reconstruction technique used, PMRT remains an issue, as rates of skin necrosis, infection, and capsular contracture are increasing.[11,12] Other adverse events, such as fibrosis, distortion, volume loss, and fat necrosis, have also been reported.[2] In our study, PMRT was performed in 42 patients (20.8%), of whom only 5 developed complications. This constitutes 11.9%, which falls within the range described in the literature (4.8%–27%).[2,11–17] Nonetheless, in regard to complication rates following PMRT specifically in Hispanic patients, our population experienced fewer overall complications when compared with existing literature (71% versus 11.9% overall).[8] The type of procedure (implant versus TE reconstruction), breast size, ptosis degree, or age were not significantly associated with the development of complications.

CONCLUSIONS

Our study sought to analyze the use of the inferior pole dermal flap for additional breast implant coverage in Hispanic patients and compare them with those in the existing literature. Our results showed similar complication profiles to those previously reported in the literature, while providing favorable aesthetic outcomes, thereby confirming the utility of this technique in this population. Given its low complication rate and cost-effectiveness, inferior pole dermal flap breast reconstruction remains a safe and affordable method for patients with ptosis and/or macromastia in the Hispanic population.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

ETHICAL APPROVAL

This study was performed in accordance with the ethical standards of the institutional committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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