



Dermoglandular flaps for autologous augmentation during mastopexy after breast implant explantation: A five-year retrospective study

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KEYWORDS

Breast implant explantation;
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Autoaugmentation;
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Summary *Background:* The number of patients requesting breast implant explantation without replacement has increased substantially. Breast deflation and recurrent ptosis are common reconstructive challenges following explantation. Dermoglandular flaps provide an autologous option for volume redistribution during mastopexy while avoiding prosthetic materials.

Objectives: To report a five-year single-center experience using dermoglandular flaps for autologous augmentation during mastopexy after breast implant explantation and explore factors associated with postoperative breast stability.

Methods: This retrospective review involved 75 consecutive patients who underwent implant explantation and mastopexy with dermoglandular flap autoaugmentation between 2019 and 2024. Demographic data, implant characteristics, surgical variables, complications, and outcomes with a mean follow-up of 16 ± 6 months were analyzed. Univariate analysis and exploratory multivariable modeling were performed to assess associations with recurrent ptosis. *Results:* Mean patient age was 45 ± 9 years. Indications for explantation included autoimmune/inflammatory syndrome induced by adjuvants-related and/or breast implant illness-related symptoms (31%), implant rupture (24%), capsular contracture grades III–IV (23%), and esthetic concerns (20%). The most commonly used flaps were lateral dermoglandular flaps (72%), followed by inferior (20%), superior (7%), and bipedicle flaps (1%). The overall complication rate was 15%. Recurrent ptosis occurred in 4% of patients and pseudoptosis or bottoming-out occurred in 4%. Patients with recurrent ptosis had larger explanted implant volumes compared with those without recurrence ($p < 0.05$). Given the low number of events, this association should be interpreted as exploratory.

Conclusions: Dermoglandular flaps appear to be a safe and versatile option for autologous augmentation and breast reshaping during implant removal, with acceptable complication

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rates and satisfactory medium-term stability. Larger explanted implant volumes may be associated with an increased risk of recurrent ptosis, highlighting the potential limitations of single-stage autoaugmentation in selected cases.

Level of Evidence: III

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The number of patients seeking breast implant explantation without replacement continues to increase. Motivations include symptomatic capsular contracture, implant rupture, esthetic concerns, patient preference for prosthesis-free reconstruction, and concerns related to breast implant illness (BII) or autoimmune/inflammatory syndrome induced by adjuvants (ASIA).¹ Although a causal relationship between silicone implants and systemic symptoms remains unproven, explantation is being increasingly requested in esthetic practice, requiring surgeons to address volume loss and breast shape distortion following implant removal.²

Explantation frequently results in deflated, widened breasts with loss of projection, lateral displacement, and residual ptosis. Conventional mastopexy techniques may address skin redundancy; however, they often fail to adequately restore upper pole fullness or central projection in the absence of implants.^{3,4} Therefore, autologous techniques aimed at redistributing native breast tissue have gained renewed interest.

Dermoglandular autoaugmentation techniques have been described using inferior, superior, lateral, and bipedicle flaps to reorient parenchymal volume and improve breast contour.^{5,6} These techniques have been successfully applied in primary mastopexy and secondary procedures, including explantation cases, offering volume preservation without prosthetic materials.^{6,7} However, data regarding long-term breast stability and factors influencing recurrent ptosis after explantation remain limited.

The purpose of this study was to report a five-year single-center experience using dermoglandular flaps for autologous augmentation during mastopexy after implant explantation and explore clinical and surgical factors associated with postoperative breast stability.

Materials and methods

Study design

A retrospective observational study was performed by including all consecutive patients who underwent breast implant removal followed by mastopexy with autologous augmentation using dermoglandular flaps between March 2019 and March 2024 (Figure 1).

Eligibility criteria

Inclusion criteria:

- Females ≥ 18 years

- Previous breast augmentation with silicone implants
- Underwent explantation + mastopexy + dermoglandular flap augmentation
- Minimum of 12 months of follow-up

Exclusion criteria:

- Incomplete clinical records
- History of breast cancer or oncologic surgery
- Planned immediate fat grafting or implant replacement
- Comorbidities that impair wound healing

Preoperative assessment

All patients underwent:

- Clinical evaluation including ptosis grade, breast width, asymmetry, and capsular contracture (Baker)
- MRI with contrast—preoperative imaging was primarily performed to assess implant integrity; additional breast imaging was obtained according to standard clinical indications for oncologic screening
- Standard five-view photography

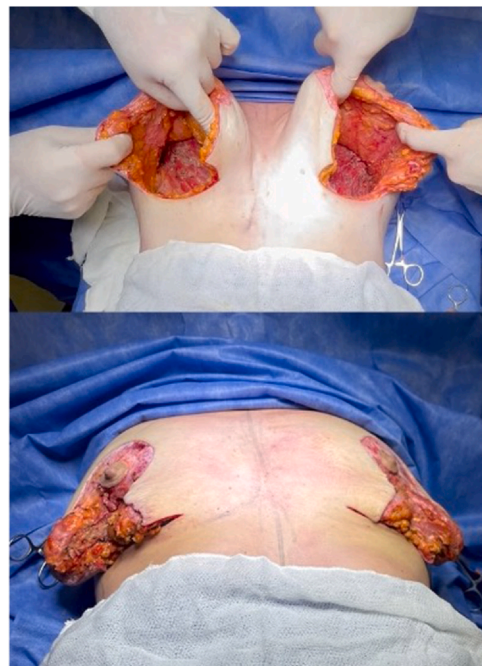


Figure 1 Intraoperative view after implant removal showing residual glandular tissue.

Operational definitions

- **Recurrent ptosis:** Descent of the nipple-areola complex > 2 cm from immediate postoperative position at 12 months.
- **Pseudoptosis/bottoming-out:** Inferior parenchymal descent with stable nipple-areola complex position.
- Measurements were performed through clinical examination and standardized photographic comparison at follow-up visits.
- **Hematoma:** Collection requiring surgical drainage.
- **Wound dehiscence:** Separation > 1 cm requiring directed care.

Surgical technique

Incisions.

- Circumvertical pattern for mild to moderate redundancy
- Wise-pattern with inframammary fold extension for substantial laxity, thick capsules, or need for better pocket access

Capsulectomy Protocol.

- **Total capsulectomy:** prepectoral implants, ruptured devices, Baker III-IV, or ASIA/BII concerns
- **Anterior capsulectomy:** subpectoral implants with posterior capsule adherence
- **No capsulectomy:** thin, asymptomatic capsules not contributing to distortion
- All excised capsules were routinely submitted for histopathological analysis.

Dermoglandular Flap Selection.

- **Lateral triangular flap:** adequate lateral tissue, most commonly used
- **Inferior pedicle:** ptosis > 6 cm or substantial lower-pole redundancy
- **Superior pedicle:** upper pole deficiency
- **Bipedicled flap:** severe volume loss

Flap selection was individualized based on tissue characteristics, degree of ptosis, and intraoperative assessment, rather than on a standardized protocol.

Flaps were deepithelialized, mobilized, rotated to the upper or central pole, and anchored to the pectoralis major fascia. No mesh or internal bra was used. Representative intra- and postoperative images are provided to illustrate flap design and clinical outcomes (Figures 2 to 5).

Postoperative Care.

- Closed-suction drains (48-72 h)
- Supportive bra for 8 weeks
- Activity restrictions for 4 weeks

Outcome measures

Esthetic outcomes were assessed through standardized clinical evaluation and comparison of pre- and postoperative photographs at follow-up visits.



Figure 2 Intraoperative image of the creation of a superior pedicle flap for breast autoaugmentation and its fixation in the upper pole of the breast.

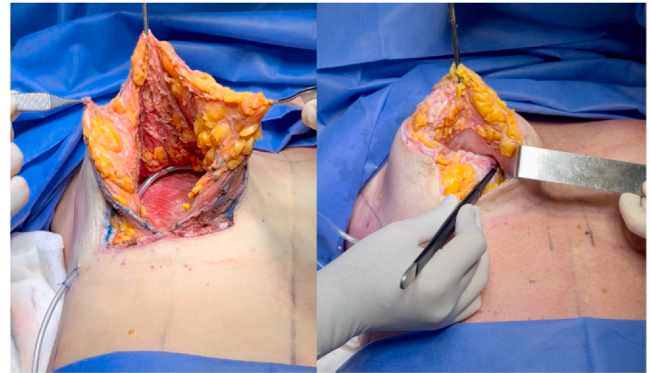


Figure 3 Intraoperative images showing the lateral flaps already made, their rotation, and fixation for use in breast autoaugmentation.

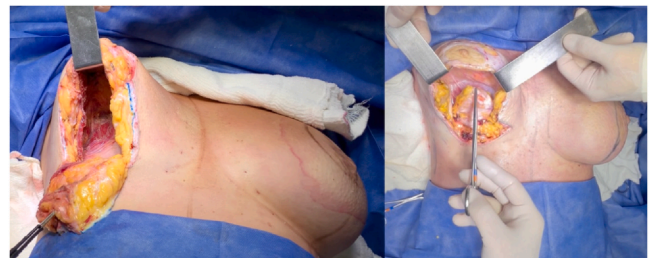


Figure 4 Intraoperative images of the inferior pedicle flap making, which is fixed to the pectoralis major aponeurosis.

Primary outcomes:

- Recurrent ptosis
- Pseudoptosis/bottoming-out
- Complications

Secondary outcomes:

- Relationship between implant volume and ptosis
- Association between implant plane and capsulectomy type

Statistical analysis

SPSS v.25 was used.

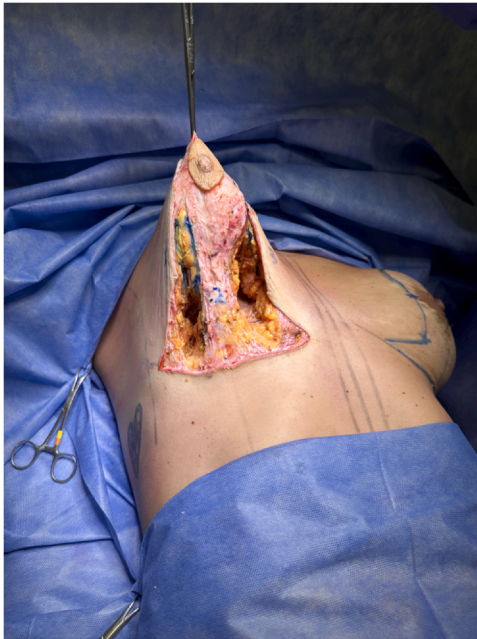


Figure 5 Intraoperative image. In the right breast, the implant has been removed and a bipedicle flap is designed.

- Continuous variables: mean $\pm$ SD or median (IQR)
- Categorical variables: frequency and percentage
- Tests: chi-square, Fisher's exact, Student's t, and Mann-Whitney U tests
- Logistic regression for predictors of ptosis (age, BMI, implant volume, plane, flap type, and capsulectomy)
- Significance: $p < 0.05$
- Given the low number of outcome events, multivariable analysis was performed for exploratory purposes only.

The study was conducted in accordance with the principles of the Declaration of Helsinki and local institutional requirements for retrospective studies. Written consent was obtained from the patients.

Results

Seventy-five women met the inclusion criteria, with a mean age of 45 ± 9 years and mean follow-up duration of 16 ± 6 months.

Implant characteristics and surgical variables

The mean explanted implant volume was 300 ± 65 cc (range 210-450 cc). Most implants were round (98%) and textured (90%). Mean implant duration in situ was 12 ± 5 years.

Implant placement was prepectoral in 47% and subpectoral in 53% of cases. Total capsulectomy was performed

in 80%, partial anterior capsulectomy in 13%, and no capsulectomy in 7% of the patients. Prepectoral implants were significantly more likely to undergo total capsulectomy compared with subpectoral implants (χ^2 test, $p < 0.01$; Table 1).

Dermoglandular flap techniques included lateral triangular flaps in 72%, inferior pedicle flaps in 20%, superior pedicle flaps in 7%, and bipedicle flaps in 1% of the patients.

Complications and postoperative breast stability

The overall rate of early postoperative complications was 15% and included hematoma requiring surgical drainage (2%), seroma managed conservatively (1%), wound dehiscence requiring local wound care (2%), delayed wound healing (4%), superficial epidermolysis of the nipple-areola complex (3%), and superficial suture extrusion managed conservatively (3%). Postoperative morphological outcomes, including recurrent ptosis (4%) and pseudoptosis or bottoming-out (4%), were analyzed separately.

Representative pre- and postoperative images demonstrated satisfactory breast shape, projection, and scar placement following dermoglandular autoaugmentation mastopexy (Figure 6).

No statistically significant differences were observed in the overall complication rates among the different dermoglandular flap techniques (Fisher's exact test, $p = 0.94$).

Implant volume and recurrent ptosis

Patients who developed recurrent ptosis had larger explanted implant volumes compared with those without recurrent ptosis (360 ± 90 vs. 270 ± 30 cc). This difference reached statistical significance as indicated by the results of the Welch's t -test ($p = 0.03$). Univariate analysis of factors potentially associated with recurrent ptosis is presented in Table 2.

No association was observed between the type of dermoglandular flap used and recurrence of ptosis (Fisher's exact test, $p = 0.88$; Table 3).

Given the low number of ptosis events, multivariable analysis was considered exploratory. In exploratory multivariable analysis, implant volume showed a potential association with recurrent ptosis; however, given the very low number of events, this finding should be interpreted with caution and considered as hypothesis-generating (Table 4).

Discussion

The increasing demand for breast implant removal without replacement has created a clinical requirement for reliable

Table 1 Implant plane and extent of capsulectomy.

Implant plane	Total capsulectomy	Partial	None	p-value
Prepectoral (n=35)	31 (88.6%)	0	4	0.01
Subpectoral (n=40)	29 (72.5%)	10	1	

Values are presented as number (%). p-value calculated using the Chi-square test.

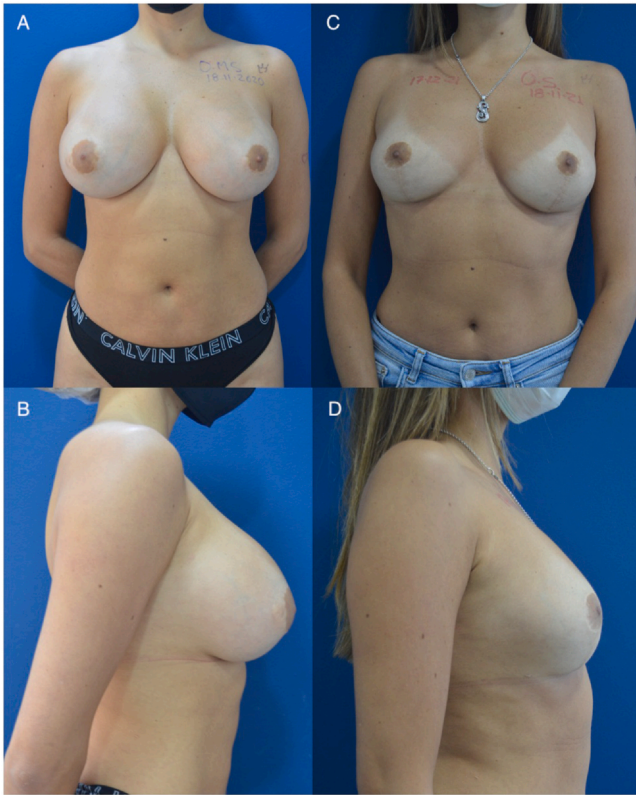


Figure 6 a y b. Preoperative images (a front and b profile) of a patient with 375 cc prepectoral implants. c and d Postoperative images after implant removal and mastopexy (c front and d profile).

autologous strategies that can restore breast shape while avoiding prosthetic materials. Our findings support the use of dermoglandular flaps as a safe and versatile option for autologous augmentation during mastopexy following explantation, with complication rates comparable to those reported in autoaugmentation mastopexy series.^{5,6}

The overall complication rate observed in this study is consistent with those in previously published studies using parenchymal redistribution techniques. Notably, no specific dermoglandular flap configuration was associated with increased complications or higher rates of recurrent ptosis. This supports the concept that flap selection should be individualized based on residual tissue distribution and degree of ptosis rather than adhering to a single preferred design, as previously suggested by Gurunluoglu et al. and other researchers. Given the retrospective design and lack

Table 3 Dermoglandular flap type and recurrence of ptosis.

Flap type	Ptosis	No ptosis	p-value
Lateral	2	52	
Inferior	1	14	
Superior + Bipedicled	0	6	0.88

p-value calculated using Fisher's exact test.

of a comparison group, these findings should be interpreted only as descriptive and hypothesis-generating.

A notable observation in this series was the association between large explanted implant volumes and recurrent ptosis. From a biomechanical perspective, autologous augmentation relies on redistribution rather than true volume replacement. Furthermore, prior studies on autogenous breast augmentation have highlighted the intrinsic limitations of native tissue in maintaining long-term projection, particularly in the case of large volume deficits.⁸ Our findings are consistent with these principles and indicate that single-stage autoaugmentation may be insufficient in selected high-volume explantation cases. However, no clinically relevant volume threshold could be established based on the available data.

Nevertheless, this association should be interpreted cautiously. The very low number of events limits the robustness of statistical inference, and the observed associations should be interpreted with caution and considered as hypothesis-generating rather than as being indicative of independent predictors. Future studies with larger cohorts and standardized measurements are required to validate these findings.

A major limitation of this study is the absence of quantitative assessment of preoperative glandular volume. As dermoglandular autoaugmentation relies on the redistribution of native tissue, insufficient residual tissue may represent a key confounding factor that influences postoperative shape and stability. Therefore, the observed association between explanted implant volume and recurrent ptosis should be interpreted with caution.

The lack of association between flap type and breast stability further reinforces the versatility of dermoglandular flaps. Rather than advocating a specific pedicle, our data support the use of a tailored approach guided by breast dimensions, tissue quality, and surgeon experience. Concepts of ideal breast proportions and parenchymal support, as described by Mallucci and Branford, may provide a useful framework when planning these procedures.⁹

Table 2 Univariate analysis of factors associated with recurrent ptosis.

Variable	No recurrent ptosis (n=72)	Recurrent ptosis (n=3)	p-value
Age, years (mean $\pm$ SD)	44 $\pm$ 9	48 $\pm$ 6	0.42†
BMI, kg/m ² (mean $\pm$ SD)	24.8 $\pm$ 2.9	26.1 $\pm$ 3.1	0.31†
Explanted implant volume, cc (mean $\pm$ SD)	270 $\pm$ 30	360 $\pm$ 90	0.03†
Implant plane (prepectoral), n (%)	33 (46%)	2 (67%)	0.61‡
Total capsulectomy, n (%)	57 (79%)	3 (100%)	0.99‡
Flap type (lateral), n (%)	52 (72%)	2 (67%)	0.88‡

† Welch's t-test. ‡ Fisher's exact test.

Table 4 Exploratory multivariable logistic regression analysis of factors associated with recurrent ptosis.

Variable	Odds Ratio (OR)	95% CI	p-value
Explanted implant volume (per 50 cc increase)	1.45	1.02–2.10	0.04
Age (per year)	1.06	0.92–1.22	0.39
BMI (per kg/m ²)	1.18	0.89–1.56	0.25
Prepectoral implant plane	1.72	0.21–13.9	0.61
Total capsulectomy	—	—	—

OR, odds ratio; CI, confidence interval.

Additionally, classification systems for breast morphology and asymmetry may further support surgical planning and outcome assessment, as described in the literature.¹⁰

The heterogeneity of indications for explantation may represent a source of selection bias and could influence postoperative outcomes. Patients undergoing explantation for esthetic reasons, implant-related complications, or systemic concerns may present with varying baseline characteristics, which could impact surgical planning and results.

Regarding capsulectomy, prepectoral implants were significantly more likely to undergo total capsulectomy, reflecting technical accessibility and the evolving clinical practice patterns. Therefore, our selective, pathology-based approach is consistent with contemporary recommendations cautioning against routine capsulectomy in the absence of clear indications.^{11,12} Recent narrative reviews on capsular contracture prevention and management further highlight the complexity of decision-making in implant-related surgery and support a selective, indication-based approach.^{13,14} Routine histopathological evaluation of the capsule will help in the identification of occult pathology; however, this aspect was not specifically analyzed in the present study.

Although patient-reported outcomes were not assessed in this study, validated instruments such as the BREAST-Q have demonstrated their value in evaluating satisfaction and quality of life after cosmetic breast surgery.^{15,16} The absence of standardized patient-reported outcome measures represents an important limitation and should be addressed in future prospective investigations.¹⁷

Although a significant proportion of patients sought explantation owing to concerns related to BII or ASIA, this study does not address systemic symptom outcomes. Current evidence emphasizes the lack of proven causality between implants and systemic disease, thereby underscoring the importance of maintaining a cautious and evidence-based approach when counseling patients.^{18,19}

Conclusions

Dermoglandular flaps represent a safe and potentially effective method for autologous augmentation and reshaping during mastopexy after implant explantation. Their versatility allows tailored reconstruction without using prosthetic materials. Complications were low and medium-term breast shape was stable. Larger explanted implant volumes were associated with recurrent ptosis, suggesting limitations of single-stage autoaugmentation.

Further prospective, multicenter studies are needed to refine indications and quantify long-term patient satisfaction.

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Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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NA.

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