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Superomedial Pedicle Breast Reduction with Lateral Pillar Turn-Up Flap: A Double-Flap Autoaugmentation Technique – A 50-Patient Series

Aslı Can
Trakya University
Arda Özdemir
drardaozdemir@gmail.com

TOBB University of Economics and Technology

Research Article

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Abstract

Background

The superomedial pedicle is widely regarded as a gold standard in reduction mammaplasty and mastopexy due to its robust vascularity, reliable nipple–areola complex (NAC) transposition, and preservation of sensory and lactational function. Conventional applications often inadequately address residual volume deficiencies in the upper lateral quadrant and may result in contour discontinuities along the superior breast pole.

Methods

This study presents a surgical modification of the superomedial pedicle incorporating a pedicle-independent lateral pillar turn-up flap. The technique is specifically designed to achieve targeted autoaugmentation of the upper lateral pole while preserving the hemodynamic integrity of the primary pedicle. A consecutive series of 50 patients undergoing reduction mammaplasty was evaluated.

Results

A total of 50 patients (100 breasts) with a mean age of 38.7 years (range, 26–58) were included. The mean follow-up duration was 12 months (range, 10–22). Preoperative sternal notch–to–nipple (SN–N) distance averaged 29.05 cm (range, 23–38 cm), which decreased to 21.8 cm (range, 20.4–23 cm) at 1 year postoperatively, indicating stable nipple positioning. The mean resection weight was 548.9 g for the right breast and 582.2 g for the left breast.

Conclusion

The lateral pillar turn-up flap provides a reliable, safe, and reproducible method for superior-lateral pole autoaugmentation. By maintaining the inherent safety of the superomedial pedicle, this modification aims to improve long-term aesthetic outcomes, to enhance upper pole projection, and to support a more anatomical repositioning of the superior breast contour.

Level of Evidence

IV

INTRODUCTION

Reduction mammaplasty remains one of the most commonly performed procedures in aesthetic breast surgery, with nearly half a million cases reported in 2016 alone and is consistently associated with high levels of patient satisfaction(1, 2). With the global rise in both average age and body mass index (BMI), the demand for reduction mammaplasty is anticipated to increase further in the coming years(1).

The primary objective of this procedure is to achieve a reduction in breast volume and weight while preserving the vascular integrity and sensory innervation of the nipple–areolar complex (NAC)(3). In addition to repositioning the NAC to an anatomically appropriate level, reduction mammaplasty aims to alleviate the functional symptoms associated with macromastia, including cervical, shoulder, and dorsal pain, postural impairment, intertriginous dermatitis, cyclical mastalgia, acromioclavicular strain, limitations in physical activity, and psychosocial distress(4). Beyond these functional improvements, aesthetic outcomes—such as optimized breast shape, enhanced projection, improved upper pole fullness, and restoration of a youthful contour—are critical determinants of overall patient satisfaction(5, 6). An ideal surgical outcome is characterized by a reduction in breast footprint, effective resection of excess skin and glandular tissue, appropriate NAC positioning, and maintenance of a harmonious upper-to-lower pole ratio, typically approximating 45:55(7).

Patients presenting for reduction mammaplasty frequently demonstrate varying degrees of breast ptosis, often accompanied by a notable depletion of upper pole fullness secondary to chronic gravitational effects. Achieving and maintaining durable upper pole fullness remains one of the principal challenges in this procedure. This difficulty is partly attributable to the absence of a universally accepted three-dimensional conceptual model of breast morphology, as well as the lack of a standardized classification system for breast hypertrophy(1). Historically, several pioneering surgeons—including Thorek, Strömbeck, Skoog, McKissock, and Wise—have contributed significantly to the evolution of reduction mammaplasty through innovations in pedicle design, skin excision patterns, and parenchymal reshaping techniques(8–13). Despite these advancements, many traditional approaches have demonstrated limitations in preserving long-term upper pole fullness, particularly beyond the early postoperative period.

In response to these limitations, contemporary surgical strategies have increasingly shifted toward techniques emphasizing autologous tissue rearrangement rather than reliance on the skin envelope alone(14). Recent developments have focused on the transposition and redistribution of adipoglandular tissue to achieve enhanced breast contour and structural support. This paradigm shift reflects the recognition that skin-based shaping is inherently susceptible to progressive stretching under gravitational forces, which may result in recurrent ptosis and loss of upper pole projection over time(15). In contrast, internal parenchymal remodeling techniques aim to establish a more stable three-dimensional breast architecture, thereby improving the longevity of aesthetic outcomes.

In this context, the present study describes a modification of the superomedial pedicle reduction mammaplasty utilizing an inverted-T scar pattern. Specifically, we introduce a lateral pillar–based adipoglandular turn-up flap transposed to the superior pole to achieve targeted autoaugmentation. This

approach is designed to enhance upper pole fullness, improve the definition of the superior breast contour, and contribute to a more aesthetically favorable décolleté, while preserving the well-established vascular reliability of the superomedial pedicle(16). The technical aspects of this method are detailed, and surgical outcomes are evaluated in a consecutive series of patients undergoing this procedure.

MATERIALS AND METHODS

Patients

This retrospective observational study included 50 female patients who underwent reduction mammaplasty using a superomedial pedicle with an inverted-T (Wise-pattern) skin resection. All procedures were performed between November 2022 and July 2025. The study population consisted of patients presenting with symptomatic macromastia, without any prior history of breast surgery.

Inclusion criteria comprised patients with breast hypertrophy associated with functional complaints and/or aesthetic concerns. Patients with a history of previous breast surgery were excluded to ensure homogeneity in surgical anatomy and postoperative outcome evaluation. As part of the standard preoperative assessment, all patients underwent radiologic breast screening to exclude underlying pathology. Depending on age and clinical indication, preoperative mammography and/or breast ultrasonography were performed. Only patients without radiologic evidence of malignancy or suspicious lesions were included.

Baseline demographic data, including age, were recorded, and standardized preoperative breast measurements were obtained. Anthropometric measurements were documented both preoperatively and at the 12-month postoperative follow-up. A total of 50 patients were included in the study. Follow-up attendance was 100% (50/50) at 1 month, 94% (47/50) at 6 months, and 84% (42/50) at the 12-month evaluation. Outcome analyses were performed based on the available follow-up data at each time point. These included the suprasternal notch–to–nipple distance and the nipple–to–inframammary fold (IMF) distance, enabling objective assessment of NAC position and postoperative breast morphology.

All patients were followed according to a standardized postoperative protocol. During follow-up, patients were prospectively monitored for early and intermediate complications, including wound dehiscence, infection, hematoma, and partial NAC compromise. Clinically high-risk breast tissue specimens were submitted for histopathological examination to identify any occult pathology. A structured follow-up system was implemented to ensure consistency in outcome assessment across the study.

This retrospective observational study was conducted in accordance with the ethical principles of the Declaration of Helsinki. As the study involved a technical modification performed during routine clinical practice without any experimental intervention beyond standard patient care, it was exempt from formal local ethics committee approval in accordance with applicable institutional requirements. Written informed consent was obtained from all patients for surgery and for the publication of their clinical photographs. Clinical trial registration number: Not applicable.

Surgical Technique

Preoperative planning was performed with the patient in the upright standing position to allow accurate assessment of breast morphology and ptosis. Standardized preoperative photographs were obtained for all patients. During the marking phase, the new position of the nipple–areolar complex (NAC) was determined in accordance with established aesthetic landmarks. Specifically, the NAC was positioned at the level of the inframammary fold (IMF) (Pitanguy's Point) and approximately 20 cm from the suprasternal notch (SN), ensuring a proportionate and harmonious breast contour(17). The vertical limb of the Wise-pattern skin resection extending from the NAC to the IMF was standardized to a length of 6 cm in all cases in order to maintain consistency in breast shaping and postoperative scar distribution. The NAC was marked under appropriate skin tension, and its diameter was maintained between 38 and 42 mm to achieve a natural and aesthetically balanced areolar size.

All procedures were performed under general anesthesia with the patient placed in the supine position. Prior to anesthetic induction, intravenous prophylactic antibiotics are given. At the beginning of the operation, a subcutaneous infiltration of an adrenaline solution (1:200,000) diluted in 1000 mL of saline was administered along the planned incision lines avoiding infiltration to the superomedial pedicle to facilitate hemostasis and improve the surgical field. The skin markings and deepithelialization were then carried out in accordance with the classical principles of superomedial pedicle reduction mammaplasty as the pedicle is incised with a unipolar cautery down to the pectoralis major fascia.

Following deepithelialization, the superomedial pedicle containing the NAC was carefully elevated and defined, preserving the vascular and neural integrity of the pedicle. Once the pedicle had been adequately mobilized, attention was directed to the lateral pillar of the breast parenchyma. Within the lateral pillar, a vertically oriented incision was made while preserving approximately 1.5–2 cm of residual pillar thickness to maintain structural support. Dissection was then carried out in an oblique superior direction, allowing the creation of a triangular adipoglandular turn-up flap with a broad vascular base. Careful mobilization of the flap was performed until sufficient rotation toward the superior pole could be achieved without tension or compromise of vascularity. Elevation of the lateral turn-up flap is shown in Fig. 1.

Figure 1

Elevation of the lateral turn-up flap.

Subsequently, the remaining lateral pillar parenchyma was sculpted in a three-dimensional manner to refine breast contour and achieve the desired postoperative breast shape. A superior submammary pocket was then created up to the 2nd intercostal space, allowing for accommodation of both the superomedial pedicle and the newly fashioned turn-up flap which will fill the upper pole. Prepared superomedial pedicle and elevated lateral turn-up flap is shown in Fig. 2.

Figure 2

Prepared superomedial pedicle and elevated lateral turn-up flap is shown in Fig. 2a., superior submammary pocket is shown in Fig. 2b.

The turn-up flap was rotated superiorly and secured to the superficial layer of the superficial fascia using one or two 2 – 0 polydioxanone (PDS) sutures, thereby providing stable fixation. This additional maneuver generally takes less than 10 minutes of surgical time. Adaptation of the lateral turn-up flap is shown in Fig. 3.

Figure 3

Adaptation of the lateral turn up flap at the 2nd intercostal area.

Following flap fixation, the superomedial pedicle was inset into its final position without tension. Closure was performed in a manner consistent with classical reduction mammaplasty techniques. The medial and lateral pillars were approximated to reconstruct the breast mound and provide internal support. The skin was closed in layers using appropriate subcutaneous and intradermal sutures to achieve optimal wound healing and scar quality. Drains were utilized in every case. Adaptation of the superomedial pedicle to the upper pole is shown in Fig. 4.

Figure 4

Adaptation of the superomedial pedicle to the upper pole.

Supplemental digital content 1 (Video 1) shows the surgical technique for lateral turn-up flap.

RESULTS

This study involved 50 patients and 100 breasts, with a mean age of 38,7 years (range: 26–58 years). The mean body mass index (BMI) of all the patients was below 40 kg/m². The procedures were performed between November 2022 and July 2025, with a mean follow-up duration of 12 months (range: 10–22 months).

Preoperative sternal notch–nipple (SN–N) distance averaged 29,05 cm (range: 23–38 cm). One year postoperatively, the average SN–N distance was 21,8 cm (range: 20,4–23 cm), demonstrating a stable nipple position and maintained breast contour. Average resection materials weighted 548,86 gr from the right breast and 582,22 gr from the left breast. The mean nipple-to-inframammary fold (N–IMF) distance decreased from 8.6 cm preoperatively to 6.2 cm postoperatively.

All patients underwent reduction mammaplasty using the modified superomedial pedicle technique with lateral pillar turn-up flap for upper pole autoaugmentation. No arterial or venous insufficiency of the nipple was observed. Similarly, no cases of fat necrosis, hematoma, or seroma were detected. Delayed wound healing occurred in 3 breasts (3%), all of which were managed successfully with local wound care, including daily dressings with antibiotic ointments, without the need for surgical revision.

Postoperative nipple–areolar complex (NAC) sensation was assessed at each follow-up visit using standardized clinical examination, including light-touch testing and patient-reported sensory perception compared with the preoperative baseline. Sensory outcomes were recorded as preserved, decreased, or absent; nipple sensation remained preserved in all cases, with no reports of clinically significant hypoesthesia. Additionally, no instances of hypertrophic scarring, keloid formation, or scar revision were noted.

The baseline demographic characteristics of the study population, along with a detailed comparative analysis of the preoperative and 12-month postoperative anthropometric measurements, are comprehensively summarized in Table 1.

Table 1

Summary of patient demographics, mean tissue resection weights, and comparative preoperative versus 12-month postoperative anthropometric measurements.

The mean operative time was around 180 minutes. Incorporation of the lateral pillar turn-up flap added an average of 5 minutes for each side without any significant delay to the standard superomedial pedicle procedure. Figure 5 illustrates the preoperative and 12-month postoperative photographs of a patient who underwent this technique.

Figure 5: Preoperative (upper row: 5a–5c) and 12-month postoperative (lower row: 5d–5f) photographs of the patient. Images were taken from the frontal view (5a, 5d), a 45-degree oblique angle (5b, 5e), and a lateral (90-degree) view (5c, 5f). The images demonstrate the aesthetic outcomes of reduction mammaplasty performed using the superomedial pedicle combined with the lateral pillar turn-up flap technique.

DISCUSSION

Reduction mammaplasty remains a technically demanding procedure due to the complex interaction between the skin envelope, breast parenchyma, and chest wall dynamics, all of which influence both early and long-term outcomes(1, 18). With advancing age and declining estrogen levels, the glandular component of the breast progressively undergoes fatty involution, accompanied by attenuation of structural support mechanisms(19). In particular, the progressive laxity of Cooper's ligaments results in diminished suspension capacity, especially in large and hypertrophic breasts, thereby contributing to ptosis and contour deformities(20).

Patient satisfaction following reduction mammaplasty is generally high, largely due to the resolution of functional symptoms associated with macromastia. However, aesthetic dissatisfaction persists in some patients, particularly regarding breast shape, projection, and long-term contour stability(21). A common limitation of traditional techniques is the progressive loss of upper pole volume, which can result in reduced projection, recurrent ptosis, and asymmetry over time(22). Among these challenges, loss of

upper pole fullness is especially significant, particularly in patients with heavy breasts, multiparity, or poor skin quality, where achieving a satisfactory upper pole contour is a primary determinant of postoperative satisfaction(23). Inadequate upper pole volume may create the appearance of pseudobottoming-out, even when the nipple–areolar complex (NAC) is correctly positioned. Although widely used, the conventional superomedial pedicle technique is limited in its ability to reliably transfer sufficient parenchymal volume to the upper pole(24). Techniques specifically addressing upper pole autoaugmentation therefore offer a clear advantage in achieving improved aesthetic outcomes(25).

Numerous pedicle designs for NAC transposition have been described; however, none has demonstrated unequivocal superiority(26). The superomedial pedicle remains one of the most widely adopted techniques due to its well-documented reliability and versatility(27, 28). Its principal advantage lies in the preservation of a robust dual vascular supply to the NAC through incorporation of both superior and medial perforators by the second and third intercostal arteries, while also maintaining sensory innervation and lactational potential(29). This vascular architecture is particularly advantageous in cases involving large resections and significant NAC transposition, where maintaining adequate perfusion is critical(27, 30). In our series, the consistent use of the superomedial pedicle was associated with an absence of vascular compromise, with no cases of arterial or venous insufficiency observed. Sensory outcomes were likewise preserved, with no patients reporting clinically significant NAC hypoesthesia. Complication rates were low and limited to minor wound-healing issues that were successfully managed with conservative local care, in accordance with existing literature(31, 32).

A variety of techniques have been described to enhance upper pole fullness in reduction mammaplasty, including central pedicle approaches, dermal suspension methods, and superiorly based dermoglandular flap transposition(33, 34). These methods offer specific advantages in selected patients, particularly in improving projection and contour; however, they do not consistently combine reliable vascularity with effective redistribution of lateral breast tissue to the superior pole(35). Another method involves the transposition of inferiorly based glandular flaps to the upper pole(36, 37). However, utilizing tissue from the most dependent and gravitationally affected portion of the breast may limit the effectiveness of this approach, particularly in large hypertrophic breasts. In addition, this technique may compromise the extent of volume reduction and hinder adequate elevation of the inframammary fold and overall breast footprint. The superomedial pedicle, widely regarded as a versatile and reproducible option across a broad range of breast sizes, provides a robust dual blood supply and remains a preferred technique in both small and large volume reductions(24). Ribeiro originally introduced parenchymal remodeling techniques aimed at improving upper pole fullness through redistribution of native breast tissue(38). In contrast to inferiorly based autoaugmentation approaches, which may be more susceptible to gravitational descent and secondary lower pole expansion over time, the present technique utilizes a pedicle-independent lateral pillar turn-up flap combined with a superomedial pedicle. This modification may provide more efficient redistribution of lateral breast tissue to the superior pole while preserving vascular reliability and potentially contributing to improved maintenance of upper pole contour.

The present modification builds upon this foundation by preserving the vascular reliability of the superomedial pedicle while incorporating a pedicle-independent lateral pillar turn-up flap for autoaugmentation. By transposing tissue from the relatively fuller and gravitationally affected lateral breast to the upper pole, this approach aims to improve superior pole fullness, enhance upper breast contour, and achieve a relative reduction in lateral bulk. By mobilizing and transposing tissue medially, the flap aims to approximate the lateral and medial pillars, contributing to a more centralized breast volume and enabling more efficient use of tissue that would otherwise be discarded. This redistribution may support a more balanced and rounded breast contour with reduced lateral flattening. This not only enhances upper pole fullness but also promotes a long-term, rounded breast shape, preventing the development of a boxy, square or laterally flattened appearance over time without compromising surgical safety(23). In our experience, patients treated with this technique demonstrated satisfactory postoperative upper pole appearance and favorable breast contour during the follow-up period, with an overall low complication profile. Furthermore, none of the patients reported complaints suggestive of bottoming-out, and no clinically significant cases were observed in this 50-patient series. These findings indicate that the present technique does not appear to increase the risk of bottoming-out compared with superomedial pedicle reduction mammaplasty techniques reported in the literature(39).

Alternative strategies to enhance upper pole fullness include implant-based augmentation and autologous fat grafting(40). While implants provide predictable volume and projection, they carry implant-related risks and do not prevent long-term ptosis. Fat grafting offers a fully autologous option; however, it is limited by variable resorption rates and potential radiologic ambiguities(41). The lateral turn-up flap may also be applied in mastopexy procedures in which preservation and elevation of native breast tissue are desired. In this context, the technique provides effective augmentation using autologous tissue, thereby decreasing the need for prosthetic implants.

Despite its advantages, the present technique is not without limitations. One of the recognized benefits of conventional reduction mammaplasty is the potential reduction in breast cancer risk through excision of glandular tissue, particularly from the upper outer quadrant where malignancies most commonly arise. In the described approach, this region is partially preserved as a lateral flap for autoaugmentation purposes, which may theoretically diminish this protective effect. Additionally, utilization of the lateral pillar as a flap limits the option of employing alternative pedicle designs, thereby reducing intraoperative flexibility. Retention of tissue for flap creation may also decrease the total volume available for resection, potentially limiting the extent of achievable reduction in selected cases. Furthermore, volume retention in the superior pole was assessed via standardized clinical photographs and clinical follow-up rather than objective volumetric modalities like 3D scanning or MRI, which constitutes a notable limitation of the current series.

CONCLUSION

A definitive and universally applicable technique for breast reduction has not yet been identified(1). The lateral pillar turn-up flap provides a predictable, reliable and reproducible autoaugmentation method for

superior pole autoaugmentation in patients seeking a stable upper pole fullness and a better décolleté(20). With this technique, the lateral bulk of the breast—commonly present and often a source of patient concern—is effectively utilized in the formation of the lateral turnover flap. By maintaining the inherent vascular safety of the superomedial pedicle and optimizing the redistribution of autologous tissue, this modification appears to enhance the aesthetic results. It allows for a more anatomical repositioning of the superior breast contour, making it an invaluable tool in the modern plastic surgeon's armamentarium.

Declarations

Author Contribution

A.C. and A.O. contributed equally to the conception and design of the study, data collection and analysis, surgical procedures, interpretation of the results, and preparation of the manuscript. Both authors reviewed and approved the final version of the manuscript.

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Table

Table 1 is available in the supplementary files section

Figures

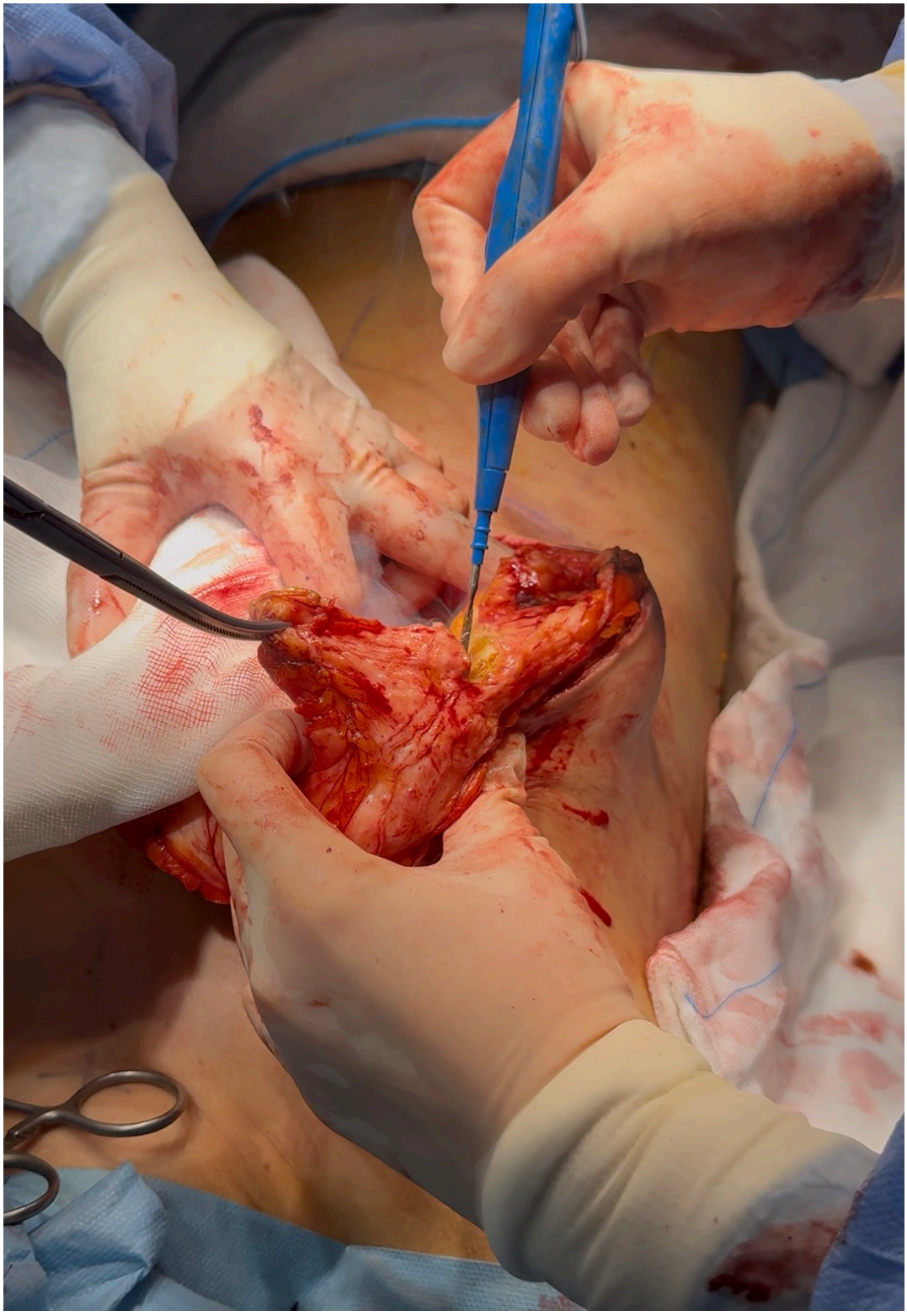


Figure 1

Elevation of the lateral turn-up flap.

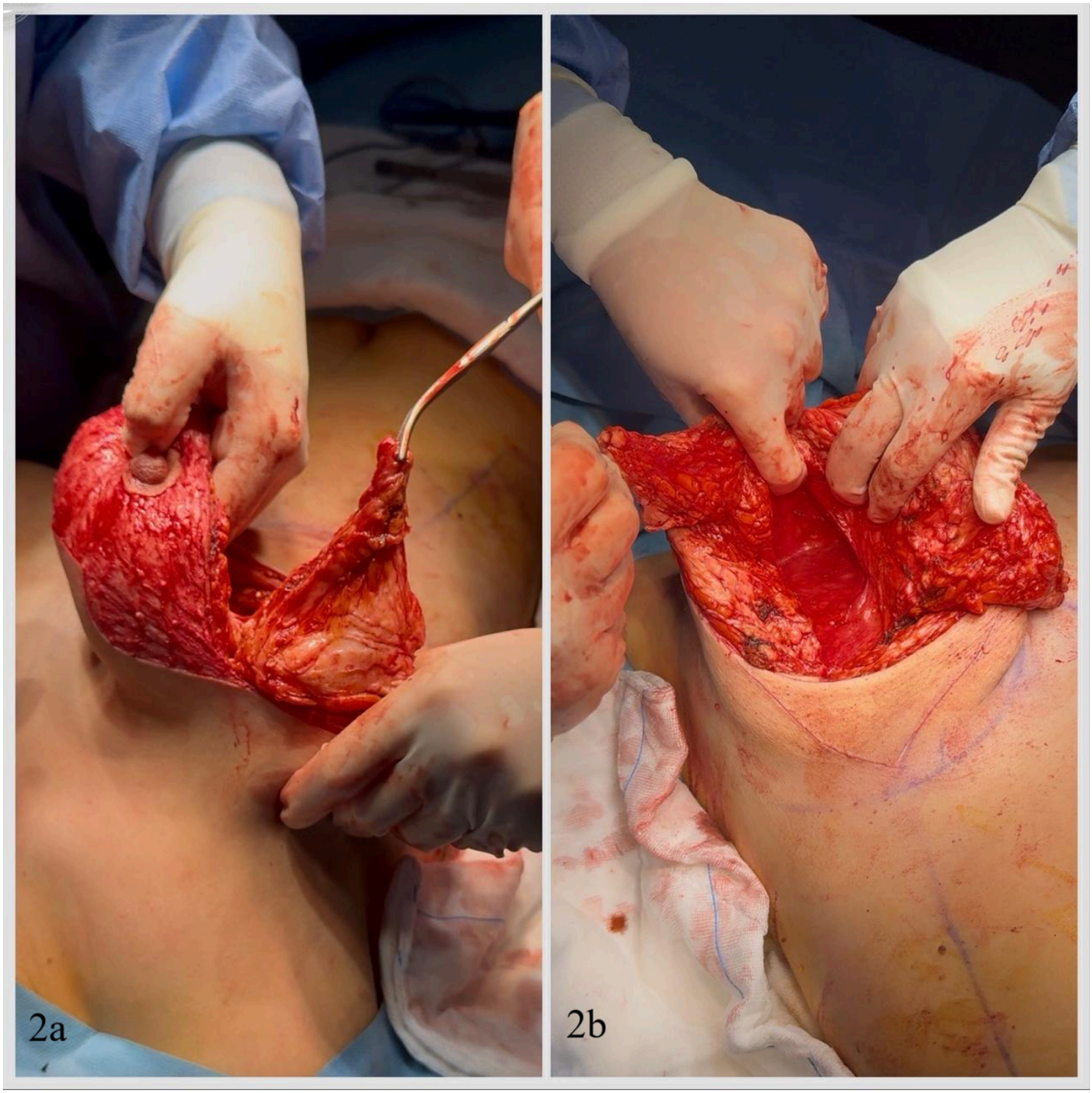


Figure 2

Prepared superomedial pedicle and elevated lateral turn-up flap is shown in Figure 2a., superior submammary pocket is shown in Figure 2b.

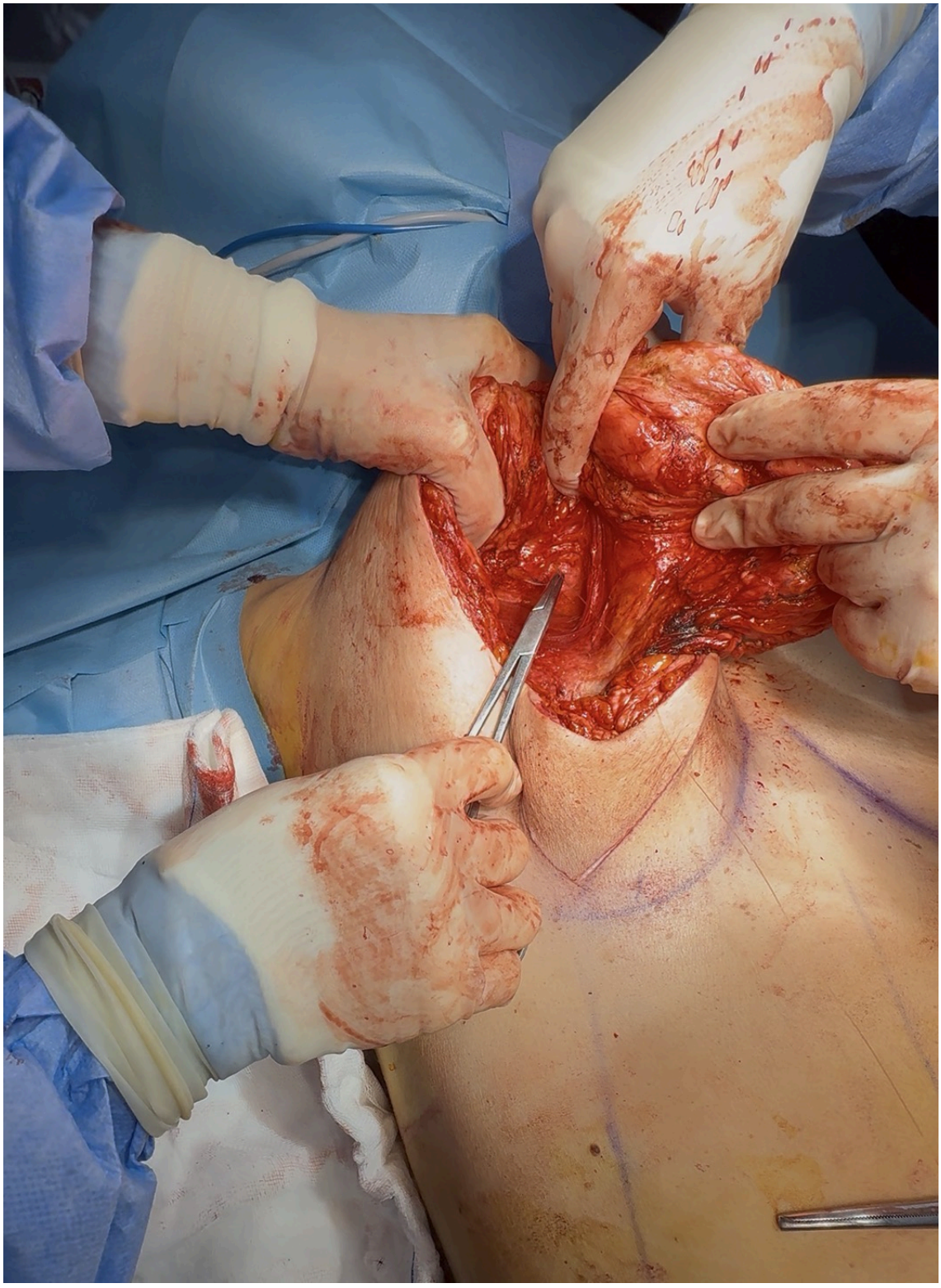


Figure 3

Adaptation of the lateral turn up flap at the 2nd intercostal area.



Figure 4

Adaptation of the superomedial pedicle to the upper pole.



Figure 5

Preoperative (upper row: 5a–5c) and 12-month postoperative (lower row: 5d–5f) photographs of the patient. Images were taken from the frontal view (5a, 5d), a 45-degree oblique angle (5b, 5e), and a lateral (90-degree) view (5c, 5f). The images demonstrate the aesthetic outcomes of reduction mammaplasty performed using the superomedial pedicle combined with the lateral pillar turn-up flap technique.

Supplementary Files

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- Table1.png
- VIDEO20260317170549.mp4