

Correlation Between Complication Rate and Tissue Resection Volume in Inferior Pedicle Reduction Mammoplasty: A Retrospective Study

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Background: *The inferior pedicle technique is the most common breast reduction procedure performed in the United States today. Traditionally, it has been recommended that pedicle techniques not be used for large volume breast reduction (>1000 gm/breast), as the complication rate may be unacceptably high.*

Objective: *We conducted a retrospective study to determine whether any correlation could be found between complication rate and tissue resection volume in breast reduction procedures when the inferior pedicle technique was used.*

Methods: *One hundred twenty-two patients underwent inferior-pedicle reduction mammoplasty by a single surgeon between January 1998 and December 2001. Patients were divided into 2 groups according to the average quantity of tissue resection: 500- to 1000-gm breast reduction, and >1000-gm breast reduction. Complications were analyzed. Rates in each group were determined and assessed for statistical significance.*

Results: *The average reduction was 673 gm/breast (range, 502-964 gm) in the small volume group (n = 73), and 1326 gm/breast (range, 1005-2175 gm) in the large-volume group (n = 49). Twenty-nine complications occurred. No patient experienced more than 1 complication. Eight different complications were identified. Hypertrophic scarring was most common, occurring in 11 patients. One major complication, an expanding hematoma, occurred. There were no cases of nipple-areolar complex or skin flap necrosis. The overall complication rate was 23.7%. There were 18 complications in the <1000-gm group (24.6%) and 11 complications in the >1000-gm group (22.4%). This difference was not statistically significant (P = .77).*

Conclusions: *The inferior pedicle technique can be safely used in reduction mammoplasty for resection volume exceeding 1000 gm/breast, without added complications. (Aesthetic Surg J 2006;26:153-156.)*

Reduction mammoplasty alters the breast aesthetically and relieves physical complaints, including chronic neck, shoulder, and upper back pain. A number of operations have been described to reduce breast volume. The inferior pedicle technique is the procedure most commonly used by plastic surgeons in the United States today.¹ The inferior pedicle technique is safe, relatively simple to master, and yields predictable aesthetic results. Its drawbacks include long incision lines and lack of parenchymal support, which may result in bottoming-out of the breast.¹

Traditionally, many plastic surgeons have advised that pedicle techniques should not be used for large volume breast reductions (>1000 gm/breast) because the complication rate may be higher, particularly for nipple-areolar complex (NAC) necrosis. Rather, the free nipple graft technique has been advocated for large-volume reductions as being safer with lower morbidity.²⁻⁵

We present a series of 122 patients who underwent bilateral inferior pedicle reduction mammoplasties performed by the senior author (J.G.H.). The data have been analyzed retrospectively to determine whether any correlation could be found between complication rate and tissue-resection volume when the inferior-pedicle technique was used.

Patients and Methods

There were 122 patients in our study. In the >1000-gm breast reduction group, patients ranged in age from 15 to 68 years (average, 37.8). In the <1000-gm breast group, ages ranged from 20 to 53 years (average, 35.5). Seventy-one percent of patients were Black or Hispanic (58% of the <1000-gm group, 93% of the >1000-gm group). This difference was statistically significant (P = .0001).

Between January 1998 and December 2001, patients underwent reduction mammoplasty by a single surgeon

Table 1. Patient characteristics

	<1000-gm Reduction group (n = 73)	>1000-gm Reduction group (n = 49)
Age	37.8 (range, 15-68)	35.5 (range, 20-53)
Race (Black/Hispanic)*	58%	93%
Volume reduction per breast	673 gm (range, 502-964)	1326 gm (range, 1005-2175)
Preoperative sternal notch-nipple distance	32.3 cm (range, 26-38)	38.3 cm (range, 34-45)
Postoperative sternal notch-nipple distance	23.1 cm (range, 19-25)	24.4 cm (range, 23-26)

*Statistically significant difference ($P = .0001$).

who used the inverted T-incision inferior-pedicle technique. Very small volume reductions (<500 gm/breast) were excluded; they were most often performed using a vertical incision technique. Unilateral inferior pedicle reductions were also excluded. Free nipple grafts were used in 4 patients during this period. Retrospective analysis was performed. The collected data included patient demographics, tissue reduction volume, preoperative and postoperative sternal notch-to-nipple distances, complication type, and rate. Average follow-up time was 9.5 months (range, 3 to 17 months).

Included patients were divided into 2 groups according to the average breast-volume reduction: a <1000-gm reduction group, and a >1000-gm reduction group. The nominal data were cross-classified in a contingency table and analyzed using the chi-square distribution and likelihood ratio test. The continuous data were analyzed using the 1-way analysis of variance table, and the mean values were compared using the Student *t* test. All the data were analyzed using JMP statistical software (v 3.2, SAS Institute Inc., Cary, NC). An alpha value of 0.05 was used in all statistical analyses, and *P* values were considered statistically significant at or below the alpha value of 0.05.

Results

The amount of resected breast tissue ranged from 502 to 964 gm/breast (average, 673 gm) in the <1000-gm group ($n = 73$). The resection range was 1005 to 2175 gm/breast (average, 1326 gm) in the >1000-gm group ($n = 49$). Preoperative sternal notch-to-nipple distance ranged from 26 to 38 cm (average, 32.3 cm) in the <1000-gm group, and 34 to 45 cm (average, 38.3 cm) in the >1000-gm group. The average postoperative sternal notch-to-nipple distances were 23.1 cm in the <1000-gm group and 24.4 cm in the >1000-gm reduction group (Table 1).

A total of 29 complications occurred in this series. No patient experienced more than 1 complication. The overall complication rate was 23.7%. There were 18 complications in the <1000-gm group (24.6%) and 11 complications in the >1000-gm group (22.4%). The difference in complication rate between the small volume and large volume groups was not statistically significant ($P = .77$). In addition, no statistical difference was noted between groups for any individual complication (Table 2).

Eight different complications were identified. Hypertrophic scars were the most common complication seen in this series, occurring in 9.0% of patients ($n = 11$). One of these patients required elective scar revision. Most incisions healed favorably, despite the fact that 71% of patients were members of minority groups who are more prone to unfavorable scarring. Residual lateral dog ears and small areas of fat necrosis were the second most frequent complications, each occurring in 4.9% of patients ($n = 6$ for each complication). Five of the dog ears were subsequently revised, as was the single case of residual medial webbing. A total of 7 patients, therefore, underwent minor revision for scar or contour deformities (5.7%). In each of the 6 cases identified, fat necrosis was a clinical or mammographic diagnosis applied to small discrete masses superior to the NAC (presumably at the cephalic end of the inferior glandular pedicle). All resolved without intervention.

One patient had a complication that required urgent surgical intervention—an expanding hematoma. Another patient developed an intraoperative cardiac arrhythmia, which resolved but necessitated admission for observation. Nipple-areolar complex and skin-flap necrosis, 2 of the most serious complications reported after reduction mammoplasty, were not observed in this series.

Table 2. Distribution of complications (n = 29)

	<1000-gm Reduction group: 73 patients n (complication rate)	>1000-gm Reduction group: 49 patients n (complication rate)	Total: 122 patients n (complication rate)
Hypertrophic scar	8 (10.9%)	3 (6.1%)	11 (9.0%)
Dog ear	5 (6.8%)	1 (2.0%)	6 (4.9%)
Fat necrosis	2 (2.7%)	4 (8.2%)	6 (4.9%)
Hematoma	1 (1.4%) (required evacuation)	1 (2.0%)	2 (1.6%)
Decreased nipple projection	1 (1.4%)	0 (0%)	1 (0.8%)
Suture granuloma	1 (1.4%)	0 (0%)	1 (0.8%)
Medial webbing	0 (0%)	1 (2.0%)	1 (0.8%)
Intraoperative arrhythmia	0 (0%)	1 (2.0%)	1 (0.8%)
Total	18 (24.6%)	11 (22.4%)	29 (23.7%)

Discussion

Reduction mammoplasty is a commonly performed plastic surgery procedure in the United States. Despite the increasing popularity of vertical-incision reduction procedures, the “T” inferior pedicle technique remains the technique of choice in this country.¹ The inferior-pedicle technique is safe, reproducible, preserves nipple vascularity, and has a short learning curve. It has disadvantages, however, including suture spitting, long incision scars, potential skin necrosis/dehiscence at the inverted “T” base, and lack of parenchymal support.³ It has been suggested that the complication rate of reduction mammoplasty is directly correlated with the amount of breast tissue resected.⁴ The free nipple graft technique has been recommended for large volume breast reductions to lower the risk of complications, especially NAC necrosis.²⁻⁵

This retrospective review failed to show any statistically significant difference in the complication rate between the small volume (<1000 gm) and the large volume (>1000 gm) procedures when the inferior pedicle technique was used. There was only 1 major surgical complication: an expanding hematoma in one breast that required urgent operative intervention (0.8%). No cases of skin flap or NAC necrosis occurred in either group.

The reported complication rates for reduction mammoplasty range from 5%¹ to 53%.⁶ The overall complication rate of 23.7% in this series is consistent with that reported in the literature. Our low major complication rate with large-volume inferior-pedicle reduction mammoplasty contradicts the traditional teaching

that pedicle techniques have a higher complication rate and are less safe than free nipple graft procedures for large-volume reduction.²⁻⁵

During this period, the free nipple graft technique was used in only 4 patients. The average reduction in this group was 2106 gm/breast (range, 1837 to 2650 gm); the average sternal notch-to-nipple distance was 49.5 cm (range, 44 to 55 cm); the average patient age was 41.5 years (range, 29-54 years). Free nipple graft procedures are infrequently necessary. This procedure should be reserved for patients with extremely long pedicle lengths (more than 25 cm), compromised vascularity (diabetics, smokers, etc) and long pedicles, and when NAC viability is questioned intraoperatively during pedicle procedures. Large reduction volume, per se, should not be a contraindication to inferior pedicle reduction mammoplasty.

This series affirms previous reports that the inferior pedicle technique can be safely and predictably used for large-volume (>1000 gm) breast reductions without increasing complication risk.⁷⁻⁹

Conclusion

The inferior pedicle technique is predictable, preserves nipple vascularity, has a short learning curve, and can be safely used in reduction mammoplasty for resection volume exceeding 1000 gm without added complications. ■

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