

To Drain or Not to Drain? A Retrospective Cohort Study of 1,098 Reduction Mammoplasties Using the Superomedial Pedicle Wise-Pattern Technique

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Introduction

- Reduction mammoplasty (RM)** surgical techniques are highly varied, including pedicle design, skin incision pattern, closing technique, and **drain utilization**
- Drains are used to remove postoperative fluid** → reduce risk of seroma or hematoma formation and thus return to the operating room for evacuation¹
- However, several studies indicate that drain usage increases the risk of surgical site infection, discomfort, and scarring^{2,3}
- American Society of Plastic Surgeons (ASPS) guidelines **do not recommend** drains in standard RM⁴
- The **lack of clear benefit makes drain use inconsistent** among plastic surgeons during RM procedures²

Objective

- To **evaluate complications** among patients who underwent **superomedial (SMP) Wise-pattern RM**, comparing those with **<800 and ≥800 grams (g)** removed
- To **investigate how the use of drains influences the occurrence of complications**

Methods

- A multicenter retrospective cohort study of patients undergoing RM between August 2019 to June 2023 was conducted
- Individuals were included if: 1) they were ≥18 years of age, 2) underwent a SMP Wise-pattern RM, and 3) had a follow-up duration of at least one month
- Patient characteristics, oncologic details, perioperative details, and complications (acute: <90 days postoperatively; chronic: ≥90 days postoperatively) were collected
- Primary outcomes were 1) **incidence of postoperative complications in <800 g and ≥800 g breast resection weight cohorts**^{5,6}, and 2) **complications in drain and drainless cohorts within each weight group**

Results

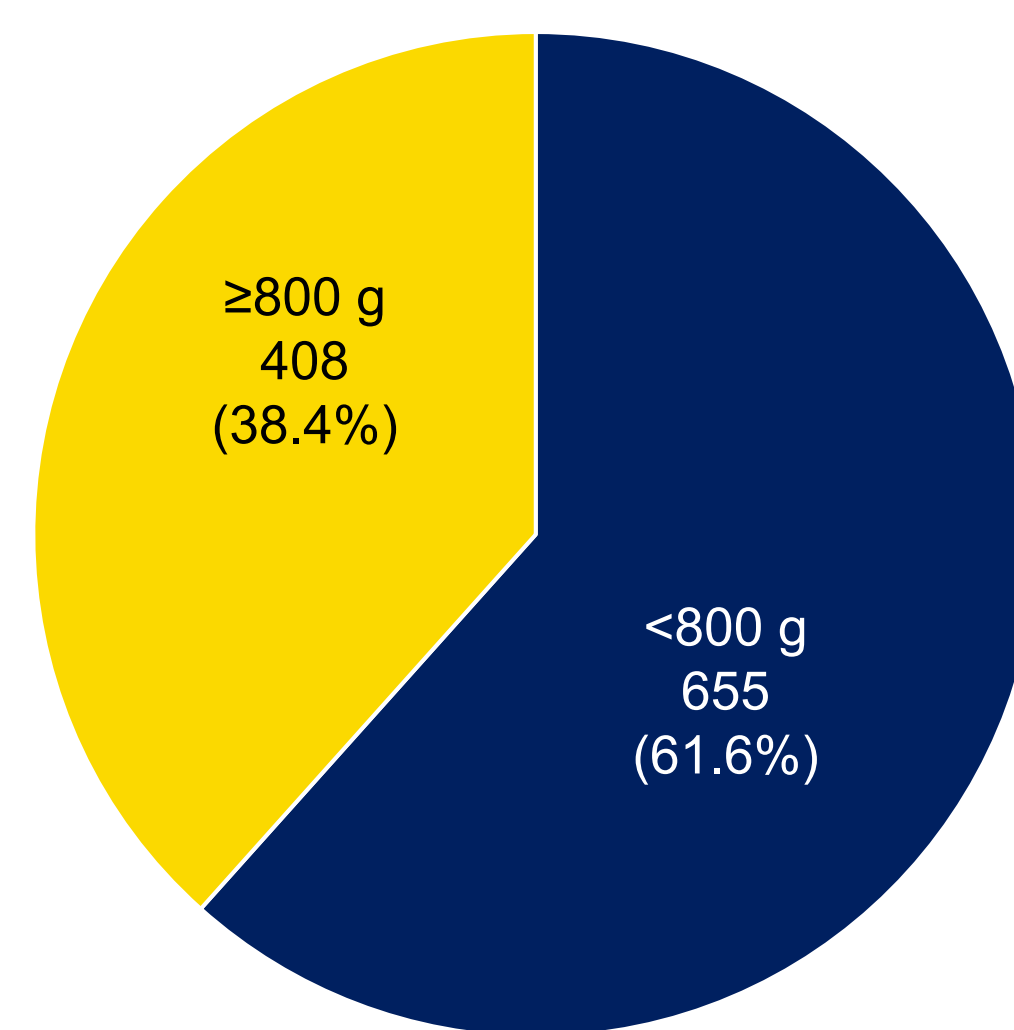


Figure 1. Number of Patients by Resection Weight

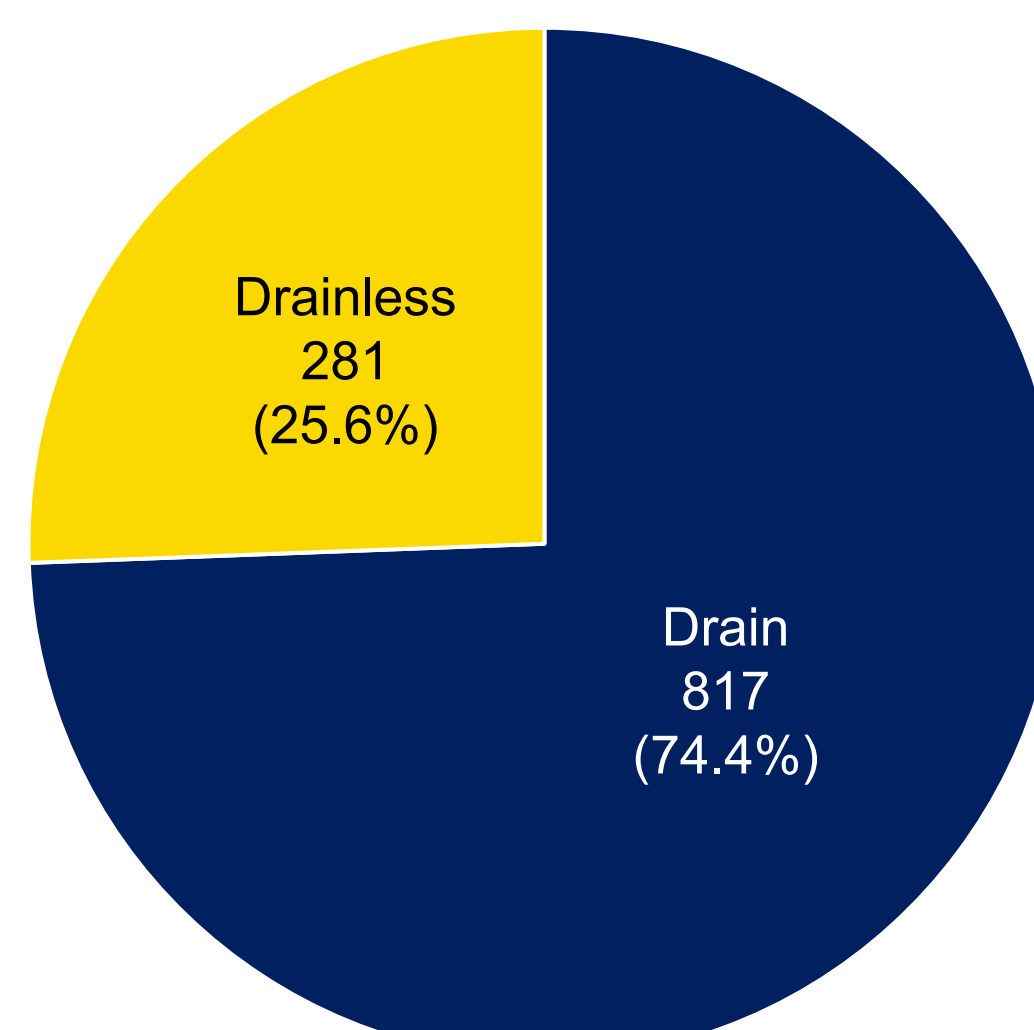


Figure 2. Number of Breasts by Drain Utilization

Table 1. Complications in <800 g Cohort by Drain Utilization

	Total No. (%) Breasts 655* (100.0)	No. (%) Breasts with Drains 517* (78.9)	No. (%) Breasts without Drains 138* (21.1)	P
Any Minor Complication	65 (9.9)	45 (8.7)	20 (14.5)	0.043
Seroma	3 (0.5)	3 (0.6)	0 (0.0)	0.493
Hematoma	8 (1.2)	4 (0.8)	4 (2.9)	0.065
Dehiscence				-
Major	5 (0.8)	4 (0.8)	1 (0.7)	0.717
Minor	29 (4.4)	22 (4.3)	7 (5.1)	0.669
SSI				-
Deep	5 (0.8)	4 (0.8)	1 (0.7)	0.717
Superficial	6 (0.9)	5 (1.0)	1 (0.7)	0.794
Nipple Necrosis				-
Partial	1 (0.2)	1 (0.2)	0 (0.0)	0.790
Full-thickness	0 (0.0)	0 (0.0)	0 (0.0)	-
Red Breast Syndrome	0 (0.0)	0 (0.0)	0 (0.0)	-
Fat Necrosis	4 (0.6)	3 (0.6)	1 (0.7)	0.611
Keloid	11 (1.7)	5 (1.0)	6 (4.3)	0.006
Reoperation	8 (1.2)	1 (0.2)	7 (5.1)	0.000

Table 2. Complications in ≥800 g Cohort by Drain Utilization

	Total No. (%) Breasts 408* (100.0)	No. (%) Breasts with Drains 285 (69.9)	No. (%) Breasts without Drains 123 (30.1)	P
Any Minor Complication	88 (21.6)	47 (16.5)	41 (33.3)	0.000
Seroma	6 (1.5)	4 (1.4)	2 (1.6)	0.562
Hematoma	7 (1.7)	1 (0.4)	6 (4.9)	0.003
Dehiscence				-
Major	3 (0.7)	0 (0.0)	3 (2.4)	0.024
Minor	40 (9.8)	26 (9.1)	14 (11.4)	0.390
SSI				-
Deep	1 (0.2)	1 (0.4)	0 (0.0)	0.709
Superficial	2 (0.5)	0 (0.0)	2 (1.6)	0.084
Nipple Necrosis				-
Partial	4 (1.0)	0 (0.0)	4 (3.3)	0.007
Full-thickness	3 (0.7)	0 (0.0)	3 (2.4)	0.024
Red Breast Syndrome	1 (0.2)	0 (0.0)	1 (0.8)	0.291
Fat Necrosis	17 (4.2)	11 (3.9)	6 (4.9)	0.569
Keloid	14 (3.4)	12 (4.2)	2 (1.6)	0.173
Reoperation	7 (1.7)	3 (1.1)	4 (3.3)	0.113

Multivariate Logistic Regression

- We controlled for BMI, FNG, sickle cell disease or trait (SCD), drain use, drain duration, and surgeon.
- In <800 g breasts, **FNG** was an independent risk factor for keloid formation (OR 126.3, 95% CI [4.911, >100.0]).
- In ≥800 g breasts, **drain use** independently reduced the risk of minor complications (OR 0.143, 95% CI [0.027, 0.742]).
- In ≥800 g breasts, **BMI** was an independent risk factor for dehiscence (OR 1.065, 95% CI [1.002, 1.132])

Patient Characteristics

- Mean age was 37.3±13.7 years
- Mean BMI was 30.3±5.4 and 36.3±5.3 for <800 g and ≥800 g cohorts, respectively (p<0.001)**
- Median CCI was 0 (0)
- No other significant differences regarding patient demographics or other comorbidities

Breast Characteristics

- Majority of breasts had **grade III ptosis (n=738, 69.4%)**, followed by grade II (n=171, 16.1%)
- Mean **areola size** was 7.6±5.9 and 9.2±6.1 for <800 g and ≥800 g breasts, respectively (p=0.010)
- Mean **N-IMF** was 13.2±3.4 and 17.0±3.3, respectively (p<0.001)
- Mean **SN-N** was 31.5±4.3 and 37.1±4.6, respectively (p<0.001)

Perioperative Details

- ≥800 g breasts more likely to undergo FNG** than <800 g breasts (n=11, 2.7% vs. n=2, 0.3%, respectively; p=0.001)
- ≥800 g breasts had larger resection weight** (1,115.5±338.5 vs. 549.5±161.1 g; p<0.001)
- Drains were used in <800 g breasts more often** than ≥800 g breasts (n=517, 78.9% vs. n=285, 69.9%, respectively; p=0.001)
- Mean duration of drain use was 6.2±4.4 days



Discussion

- Lack of a surgical drain was associated with a higher rate of minor complications in ≥800 g removed**
- Overall rate of reoperation was low** at 0.5% and 3.9% in drain and drainless cohorts, respectively
- Mean **duration of drain use was 6.3 days** → longer than durations reported in existing literature^{7,8}, yet low incidence of seroma and infection
- In our patient population, which had a wide range of resection weights (range=19-3,575 g) and predominantly ptotic breasts, **BMI and resection weight were risk factors for increased surgical complications**
- SMP-based RM preserves the blood supply to the NAC, reduces the risks of blood and fluid accumulation, and preserves a larger surface area of breast tissue for better lymphatic drainage**
- This study has several **limitations**: 1) retrospective design and 2) focused on SMP Wise-pattern RM only

Conclusion

This retrospective cohort study indicates significant differences in postoperative complications and reoperation rates based on resection weight using the SMP Wise-pattern technique for RM. The use of surgical drains may be protective against complications and reoperation in RM patients, particularly those with ≥800 g removed. Therefore, reconsideration and revision of the current ASPS guidelines are warranted to improve patient outcomes in RM procedures.

References

- Ngan, P. G., Iqbal, H. J., Jayagopal, S., Sillitoe, A. T., Dhital, S. K., & Juma, A. (2009). When to use drains in breast reduction surgery?. *Annals of plastic surgery*, 63(2), 135-137.
- Wyse, S. W., Banducci, D. R., Mackay, D., Graham, W. P., & Hall, W. W. (2003). Routine drainage is not required in reduction mammoplasty. *Plastic and reconstructive surgery*, 111(1), 113-117. <https://doi.org/10.1097/01.PRS.0000037867.10862.80>
- Felipe, W. A., Wernick, G. L., & Santos-Lopes, G. (2007). Surgical site infection among women discharged with a drain in situ after breast cancer surgery. *World journal of surgery*, 31(12), 2293-2301. <https://doi.org/10.1007/s00268-007-5245-3>
- <https://www.plasticsurgery.org/Documents/Health-Policy/Guidelines/guideline-2011-reduction-mammoplasty.pdf>
- Wetstein, R., Christodides, E., Patel, B., Pappas, G., & Harder, Y. (2011). Superior pedicle breast reduction for hypertrophy with massive ptosis. *Journal of plastic, reconstructive & aesthetic surgery*. *JPRAS*, 64(4), 500-507. <https://doi.org/10.1016/j.jps.2010.05.018>
- Singola, R., Bracha, G., Zoubi, T., Zaratek, A., Inbal, A., Gur, E., Barnea, Y., & Avni, E. (2021). Superomedial Pedicle Breast Reduction for Gigantic Breast Hypertrophy: Experience in 341 Breasts and Suggested Safety Modifications. *Aesthetic plastic surgery*, 45(2), 375-385. <https://doi.org/10.1007/s00266-020-01973-y>
- Morrison, K. A., Karp, N. S., & Choi, M. (2023). The Underutilized Superomedial Pedicle Reduction Mammoplasty: Safe and Effective Outcomes. *Plastic and reconstructive surgery*. <https://doi.org/10.1097/PRS.00000000000010949>. Advance online publication. <https://doi.org/10.1097/PRS.00000000000010949>
- Shima H, Kuzomi G, Sato K, et al. An Optimal Timing for Removing a Drain After Breast Surgery: A Systematic Review and Meta-Analysis. *J Surg Res*. 2021;267:267-273. doi:10.1016/j.jss.2021.05.021