



# Risk factor stratification of three different pedicle techniques in reduction mammoplasty—the importance of an armamentarium of techniques individually addressing mild to severe breast hypertrophy

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The preservation of the neurovascular integrity of the nipple-areolar complex (NAC) remains a primary concern performing a reduction mammoplasty. In this context numerous techniques have been described in the past with controversial discussions on advantages and disadvantages regarding different pedicles and potential predictive risk factors in patients requiring a reduction mammoplasty (1). The most severe complication of NAC necrosis in breast reduction and mastopexy has been reported up to 7.3% (2,3). Previous publications reported delayed wound healing as the most common complication associated with risk factors like age, distance between sternal-notch and nipple-areola-complex (SN-NAC distance), smoking, body mass index (BMI) and the amount of resected breast volume (1,4).

In the current study Palve *et al.* present a retrospective review of 760 patients including three different pedicles [superomedial (SMP): 477 patients (63%); superior (SP): 201 patients (26%), and inferior (IP): 82 patients (11%) combined with statistical risk factor analysis to emphasize predictors of complications, classified by Clavien-Dindo (5,6)]. A total of 578 patients (76%) were bilateral, 182 (24%) unilateral. The indication for reduction

mammoplasty was macromastia in bi- and unilateral cases as well as unilateral reduction mammoplasties in breast reconstruction cases with an average resection weight per breast of 460 grams.

The IP is a well-established technique in a wide range of macromastic breast types and the complication rate is rather low (7). A major criticism is a potential development of “bottoming out” in the lower pole, especially in gigantomastic breasts with severely impaired skin quality (8). On the other hand, the SMP can be used with various skin reductions and has been frequently reported to be reliable and safe (8-10) and has some advantages: Compared to the SP, the SMP incorporates more medial parenchyma and thereby provides better vascularity of the NAC, a lower risk for bottoming out and an improved cosmetic durability (11). The superomedial pedicle can also be improved by combining the 2<sup>nd</sup> and 3<sup>rd</sup> intercostal perforators with the perforators rising from the “Wueringer’s breast septum” as a Double-Unit-Superomedio-central (DUS) pedicle, especially in gigantomastic cases (8). The advantage of two independent sources of blood supply can potentially enhance the vascularity of the NAC and thereby potentially

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lower the NAC loss risk (12).

The study, written by Palve *et al.* is well structured with good statistical analysis. Overall complication rate (mainly minor delayed wound healing) was higher in IP (50%) compared to SMP (36%) and SP (26%). Multivariable analysis showed a statistically significant higher risk for complications in the IP group, age <50 years, bilateral reduction and resected tissue >650 g per breast. These findings are consistent with the majority of previous studies (1,2,13), except of a higher risk for complications at an age below 50 years. The majority of prior studies reported that the risk of complications and tissue necrosis gradually increased with advanced age (14,15). The author's findings were supported by only two other studies (16,17), that also found a higher risk for complications in patients younger than 50 years. The reasons for these findings were stated as mainly speculative and should be further evaluated in upcoming studies.

As stated by the authors, wound complications occurred in the patient cohort (35–37%) commonly at the point of greatest stress and/or tension in the middle of the inframammary fold, which is in our opinion usually at the “tripod zone” in the lower pole. Correspondent with the authors, we prefer to use non-barbed monofilament sutures for pillar sutures and skin closure. As an additional preventive measure, we recommend to start the key sutures laterally so that the lateral skin excess is pushed medially to reduce tension at the tripod point combined with placing multiplanar pillar sutures including an anchor suture in the T junction. During skin closure we also recommend to avoid any stitch-out of the vertical or horizontal intracutaneous suture in this very vulnerable region (8).

As stated by the authors, this study has limitations. The three pedicle groups are not equal in patient numbers which is the major weakness of this study and increases the risk for simple bias. Despite, patient reported outcome parameters (PROs), especially concerning aesthetic patient satisfaction in each group and NAC sensibility were not tested, which is important comparing the outcome and impact of three different pedicle techniques. The SP combined with vertical incision differs substantially from the wise pattern approach, especially regarding the additional tripod zone in the inverted T incisional procedures (IP and SMP), potentially influencing the complication rates in these groups. Highlighting the predictive risk factors is, perhaps, the main contribution of this paper. Application of this analysis will potentially provide for safe and effective results in patients with macromastia seeking for reduction mammoplasty.

However, just important as the risk stratification analysis by the authors, is the discussion about the adequate pedicle choice. As stated by the authors, pedicle selection and skin excision pattern should be considered individually, depending on patient's anatomical characteristics like age, BMI, skin quality and elasticity, amount of skin redundancy, SN-NAC distance, NAC-inframammary fold (IMF) distance (as a particular risk factor for bottoming out), patient's desired breast size, comorbidities, smoking status and the surgeon's preference.

Hall-Findlay stated in her publication in 2013: “*The best breast reduction is the one the surgeon does the best*” (18). According to Abraham Maslow's quote “*If all you have is a hammer, everything looks like a nail*”, a plastic surgeon should optimally provide a sufficient armamentarium of breast reduction techniques to be able to optimally address each macromastia patient's individual anatomical conditions.

In summary, Palve *et al.* are to be congratulated for describing a distinctive risk factor analysis comparing three different pedicles in reduction mammoplasty.

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## References

1. Simpson AM, Donato DP, Kwok AC, et al. Predictors of complications following breast reduction surgery: A National Surgical Quality Improvement Program study of 16,812 cases. *J Plast Reconstr Aesthet Surg* 2019;72:43-51.
2. Rohrich RJ, Gosman AA, Brown SA, et al. Current preferences for breast reduction techniques: a survey of board-certified plastic surgeons 2002. *Plast Reconstr Surg* 2004;114:1724-33; discussion 1734-6.
3. Ogunleye AA, Leroux O, Morrison N, et al. Complications After Reduction Mammoplasty: A Comparison of Wise Pattern/Inferior Pedicle and Vertical Scar/Superomedial Pedicle. *Ann Plast Surg* 2017;79:13-6.
4. Young ZT, Close M, Herrera FA. National Surgical Quality Improvement Program Analysis of 9110 Reduction Mammoplasty Patients: Identifying Risk Factors Associated With Complications in Patients Older Than 60 Years. *Ann Plast Surg* 2019;82:S446-9.
5. Palve J, Kuuskeri M, Luukkaala T, et al. Predictive risk factors of complications in reduction mammoplasty—analysis of three different pedicles. *Gland Surg* 2022;11:1309-22.
6. Winter R, Haug I, Lebo P, et al. Standardizing the complication rate after breast reduction using the Clavien-Dindo classification. *Surgery* 2017;161:1430-5.
7. Hammond DC, O'Connor EA, Knoll GM. The short-scar periareolar inferior pedicle reduction technique in severe mammary hypertrophy. *Plast Reconstr Surg* 2015;135:34-40.
8. Wolter A, Fertsch S, Munder B, et al. Double-Unit Superomedio-Central (DUS) Pedicle Inverted-T Reduction Mammoplasty in Gigantomastia: A 7-year Single-Center Retrospective Study. *Aesthetic Plast Surg* 2021;45:2061-74.
9. Landau AG, Hudson DA. Choosing the superomedial pedicle for reduction mammoplasty in gigantomastia. *Plast Reconstr Surg* 2008;121:735-9.
10. Antony AK, Yegiyants SS, Danielson KK, et al. A matched cohort study of superomedial pedicle vertical scar breast reduction (100 breasts) and traditional inferior pedicle Wise-pattern reduction (100 breasts): an outcomes study over 3 years. *Plast Reconstr Surg* 2013;132:1068-76.
11. Bauermeister AJ, Gill K, Zuriarrain A, et al. "Reduction mammoplasty with superomedial pedicle technique: A literature review and retrospective analysis of 938 consecutive breast reductions". *J Plast Reconstr Aesthet Surg* 2019;72:410-8.
12. Hammond DC. Invited Discussion on: Double-Unit Superomedio-Central (DUS) Pedicle Inverted-T Reduction Mammoplasty in Gigantomastia-A 7-Year Single-Center Retrospective Study. *Aesthetic Plast Surg* 2021;45:2075-6.
13. Wong C, Vucovich M, Rohrich R. Mastopexy and reduction mammoplasty pedicles and skin resection patterns. *Plast Reconstr Surg Glob Open* 2014;2:e202.
14. Shermak MA, Chang D, Buretta K, et al. Increasing age impairs outcomes in breast reduction surgery. *Plast Reconstr Surg* 2011;128:1182-7.
15. Aravind P, Siotos C, Bernatowicz E, et al. Breast Reduction in Adults: Identifying Risk Factors for Overall 30-Day Postoperative Complications. *Aesthet Surg J* 2020;40:NP676-85.
16. Cunningham BL, Gear AJ, Kerrigan CL, et al. Analysis of breast reduction complications derived from the BRAVO study. *Plast Reconstr Surg* 2005;115:1597-604.
17. Roehl K, Craig ES, Gómez V, et al. Breast reduction: safe in the morbidly obese? *Plast Reconstr Surg* 2008;122:370-8.
18. Hall-Findlay EJ. Discussion: a matched cohort study of superomedial pedicle vertical scar breast reduction (100 breasts) and traditional inferior pedicle Wise-pattern reduction (100 breasts): an outcomes study over 3 years. *Plast Reconstr Surg* 2013;132:1077-9.

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