Aesth Plast Surg (2023) 47:544–545
https://doi.org/10.1007/s00266-021-02575-y

EDITOR'S INVITED DISCUSSION

Invited Discussion on: Effect of Reduction Mammoplasty on Insulin and Lipid Metabolism in the Postoperative Third Month: Compensatory Hip Enlargement

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Received: 1 September 2021 / Accepted: 2 September 2021 / Published online: 21 February 2023

Level of Evidence V This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.

In the article titled *Effect of Reduction Mammoplasty on Insulin and Lipid Metabolism in the Postoperative Third month: Compensatory Hip Enlargement*, the authors highlight important laboratory and anthropometric alterations following reduction mammoplasty [1]. We commend the authors for their important contributions in elucidating postoperative metabolic and physiologic changes following reduction mammaplasty.

This prospective study was conducted at a single institution over a one-year period and included 42 patients undergoing reduction mammoplasty. All patients had physical exam findings consistent with macromastia on clinical examination (back pain, neck pain, intertrigo around the breasts, and bra strap marks). A consistent preoperative diet regimen was implemented, and patients were asked to maintain current activity levels and postpone initiation of any exercise programs through the data collection process. Pre- and postoperative laboratory analyses measured fasting plasma glucose, insulin, total cholesterol, triglyceride, high density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL), HgA1c, insulin sensitivity, adiponectin, leptin, and resistin. Blood samples were compared to preoperative values, postoperative day 40 and 3 months postoperative. Additionally, anthropometric measurements were taken during the same intervals of body mass index (BMI), waist–hip ratio (WHR), breast, chest, and waist circumferences.

The authors found that total cholesterol, triglyceride, LDL, HgA1c levels, chest, and waist circumferences were not affected by reduction mammoplasty operation based upon 40th day and third month results postoperatively. Reduction mammoplasty resulted in a transient improvement in metabolic profile on the 40th day postoperatively but these changes did not persist into the third month where they returned to baseline preoperative levels. These findings are in accordance with prior studies focusing on postoperative weight loss following abdominoplasty and breast reduction with limited effects on durable weight loss [2, 3]. Laboratory data were not affected by reduction mammaplasty considering 40th day and third month results postoperatively.

Levels of adiponectin increased, and leptin decreased on the 40th postoperative day but returned to baseline in the third month. The effect of reduction mammaplasty on anthropometric measurements showed a reduction in bodyweight and BMI in the 40th day but a regression to preoperative baseline in the third month. The authors noted that hip circumference gradually increased at 40th day and 3-month measurements (2.90 ± 4.69, $p < 0.001$) compared to baseline [1]. These findings have important implications suggesting a shift in body fat distribution and fat metabolism in response to surgical intervention.

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While this study supports the concept of compensatory changes in body fat distribution following reduction mammoplasty, there is a methodological consideration that could strengthen this study. Given that other factors could impact body fat distribution in a cohort of women, a control group matched for BMI that did not undergo surgery and had similar anthropometric measurements preformed would help reinforce the conclusions. Notably, the timing of this study during the COVID-19 pandemic should have been addressed. In a longitudinal cohort study in JAMA by Lin et al, authors noted during the COVID-19 pandemic (February 1–June 1, 2020) irrespective of geographic location or comorbidities participants gained approximately 1.5 lb of excess weight every month [4]. Given the temporal association of this study with the global pandemic, it is difficult to elucidate if the postoperative findings of fatty hypertrophy of the hips can be attributed to alterations in fat distribution in response to reduction mammaplasty or simply sequelae from the effects of shelter-in-place orders and reduced physical activity. Additionally, it would be insightful to see a larger sample size and longer follow-up period to capture late stage physiologic and anthropometric changes.

Another issue is a proposed metabolic mechanism for the aforementioned changes, assuming that other environmental factors can be ruled out. While changes in adipokine concentrations may be implicated, the actual mass of adipose tissue being removed in the reduction mammoplasty procedures is modest and analogous to a small-to-moderate volume liposuction case (1435.85 ± 721.16 g). Moreover, a portion of the mammoplasty tissue removed is non-adipose breast tissue that would not change overall adipose mass in the body. The authors cite the work of Tchoukalova et al, showing lower body adipocyte hyperplasia in response to overfeeding studies [5]. However, it is hard to generalize their findings to this current study.

In summary, the authors should be congratulated for their contribution to the body of literature on compensatory changes in body morphology after breast reduction. The finding of fatty hypertrophy of the hip region at the 40th day and third month measurement following reduction mammoplasty is quite interesting. This paper highlights an important paradigm shift to consider pathophysiologic changes following the resection of adipose tissue given its systemic autocrine, paracrine, and exocrine effects. As further data on this topic evolves, compensatory changes in body habitus might be included in preoperative patient counseling discussions.

Acknowledgements We thank the authors for the timely and novel addition to the body of research.

Declarations

Conflict of interest The authors have no conflict of interest to disclose.

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