

Metabolic and Body Composition Changes After Skin Reduction Surgery Following Massive Weight Loss

PATRICK S. HARTY^{1,2}, RICHARD A. STECKER², GRANT M. TINSLEY¹, and CHAD M. KERKSICK²

¹Energy Balance & Body Composition Laboratory; Department of Kinesiology & Sport Management, Texas Tech University, Lubbock, TX

²Exercise and Performance Nutrition Laboratory; Department of Exercise Science; Lindenwood University; St. Charles, MO

Category: Graduate Student

ABSTRACT

CASE HISTORY: The patient is a 30-year-old woman who lost more than 200 pounds over the course of several years through a combination of bariatric surgery, diet, and exercise. Generally, losing more than 100 pounds leaves patients with significant amounts of excess tissue and loose skin that must be corrected via skin reduction plastic surgery to support aesthetic and functional outcomes. This excess tissue also contributes to abnormal body composition results and could potentially influence resting metabolic rate. This case study examined the implications of skin reduction surgery on measures of body composition and resting metabolism. The patient presented to the testing facility and expressed dissatisfaction with the excess integumentary tissue on her abdomen, arms, and legs. She relayed her scheduled surgical intervention to the research team, which included the following procedures: abdominoplasty (tummy tuck), thighplasty (thigh-buttock lift), and brachioplasty (upper arm lift). Body composition and metabolic measurements were performed three weeks prior to the date of surgery, one month post-surgery, and three months post-surgery. **PHYSICAL EXAM:** The participant's baseline body fat percentage assessed via dual-energy x-ray absorptiometry (DXA) was 23.6%, with 18.47 kg of fat mass and 59.76 kg of fat-free mass, respectively. Baseline resting metabolic rate (RMR) was estimated via indirect calorimetry and was found to be 2143 kcal/day. **DIFFERENTIAL DIAGNOSES:** It appears that these results may have been influenced by excess skin or connective tissue. **TESTS & RESULTS:** Initial post-testing body composition estimates were likely skewed by edema caused by the wide incisions at the varied surgical sites across much of the body surface. In addition, surgical drains were still present at relevant incision sites during this visit. Initial post-testing body fat percentage was 21.9%, with the participant displaying 18.70 kg fat mass and 66.70 kg fat-free mass. Initial post-testing RMR was 2009 kcal/day. Final post-testing was conducted approximately three months after surgery. Final body fat percentage was 26.5%, with 21.88 kg of fat mass and 60.72 kg of fat-free mass. Final RMR was 1812 kcal/day. **FINAL DIAGNOSIS:** Excess skin tissue was removed, reducing potential error in our results. **DISCUSSION:** Skin reduction plastic surgery influenced body composition estimates, with final post-testing estimates displaying greater body fat percentage than baseline. Such an effect could be explained by the excess skin tissue being identified by the DXA algorithm as 'lean mass' at baseline. RMR estimates generally decreased following removal of the excess tissue. **OUTCOME OF THE CASE:** The participant planned to undergo several additional plastic surgery interventions to target additional areas where excess tissue was still present. Research and health care professionals should be aware of how to communicate body composition results to patients who have lost large amounts of body mass and present with excess skin tissue, as these factors may skew body composition estimates. **RETURN TO ACTIVITY AND FURTHER FOLLOW-UP:** After a six-week abstention from exercise due to the surgical drains, the participant resumed normal training activities.