

Lower Body Contouring Following Massive Weight Loss

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By

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ABSTRACT

After massive weight loss, skin redundancy remains an aesthetic and a functional problem that remains amenable only by surgical excision. Lower body deformities are the most troublesome for most patients. *Aim of work:* To study and implement the different surgical treatment options for the management of the various lower body deformities. *Patients and methods:* 30 massive weight loss patients after they achieved their maximal weight loss as determined by the BMI that had been stable for at least 6 months prior to surgical interventions. *Conclusion:* management of lower truncal deformities with circumferential torsioplasty provides the optimum cosmetic result.

KEY WORDS

Obesity, body mass index, massive weight loss, lower body contouring, circumferential torsioplasty, belt lipectomy, lower body lift, abdominoplasty, thigh lift, augmentation buttockpexy.

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LIST OF ABBREVIATIONS

Abbreviation	The full term
BMI	Body Mass Index
CHD	Coronary Heart Disease
COPD	Chronic Obstructive Pulmonary Disease
DIEAs	Deep Inferior Epigastric Arteries
DVT	Deep Venous Thrombosis
FDA	Food and Drug Association
FFM	Fat-free Mass
GORD	Gastro-Oesophageal Reflux Disease
HLT	High Lateral Tension
LAGB	Laparoscopic Adjustable Gastric Band
RYGB	Roux-en-Y Gastric Bypass
SFS	Superficial Fascial System
VBG	Vertical Banded Gastroplasty

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INTRODUCTION

Today overweight is one of the biggest health problems in the world, where it performs the background for many diseases; cardiovascular problems, diabetes mellitus, respiratory diseases, and malignant diseases of the gastrointestinal tract. (*Heljic et al.; 2001*)

While weight reduction allows improvement in health status and lifestyle, still physical sequelae will require further management. (*Taylor et al.; 2004*)

With the growing number of bariatric surgery patients, the massive-weight-loss patient population is on the rise. The generalized redundancy of skin following massive weight loss is an aesthetic and, often, a functional problem that remains amenable only by surgical excision. (*Al Aly et al.; 2004*)

Body contouring of massive weight loss patients is the latest frontier in plastic surgery. It is so important to become familiar with the presentation of these patients and with the delineation and effective treatment of their deformities. (*Davison et al.; 2007*)

After massive weight loss, former obese patients have adipose and cutaneous excess, the skin has lost most of its elasticity. (*Favre et al.; 2005*)

Areas affected include the arms, breasts, abdomen, back and thighs and may result in musculoskeletal strain, intertrigo or functional limitation with walking, maintaining adequate hygiene, bowel and bladder habits, and sexual activity. These elements compound the psychosocial issues related to massive weight loss. (*Chandawarkar; 2006*)

To completely address the treatment of patients following massive weight loss, body contouring procedures are performed often in one stage and tailored to each patient, to rid the functional and aesthetic impairments from skin redundancy. (*Heddens; 2004*)

Several techniques have been designed and perfected to address the needs of these patients. These include breast, thigh and lower body lift, abdominoplasty, face and neck lifts as well as brachioplasty or arm lift,

beside other newer nonsurgical techniques. Recognizing that there is a qualitative as well as quantitative difference in the type and amount of tissues in postbariatric patients, these techniques have been suitably refined to optimize outcomes and provide safe and durable recontouring. (*Chandawarkar; 2006*)

Among the different contour deformities a massive weight loss patient might suffer, the lower body deformities represent the most common and most troublesome for most patients. Strategic skills in terms of assessment of each patient, careful planning, timing, especially for patient safety and technique, are fundamental for the success of these often complex and extensive procedures. (*Sanger et al.; 2006*)

The optimization of results in lower body contouring requires simultaneous visualization of all body regions. This goal is achieved through a circumferential and balanced surgical approach. There are several factors affecting the choice of the technique such as gender of the patient, age, general condition, general adiposity, skin condition, and patient's wishes. (*Rohrich et al.; 1999*)

Overweight women tend to have large deposits of fat in the hips, circumferentially along the thighs, flanks, lower abdomen, and intraabdominally, creating a gynecoid or "pear-shaped" body habitus. Morbidly obese men have an android or central distribution of fat. Much of their adiposity is confined to the abdomen, flanks, hips, and inner thighs. The prolonged period of skin under tension and the frequent history of "yo-yo" dieting lead to poor skin tone following massive weight loss. The contour deformities of morbidly obese individuals following massive weight loss are also quite characteristic. Women tend to have excess skin along the anterior abdominal wall, flank, and hip regions and cellulite and excess skin along the thighs and buttocks. The buttocks and pubic areas are often ptotic and redundant. Men have similar changes to the abdominal, flank, hip, inner thigh, and pubic regions; however, the anterior, posterior, and lateral thighs and buttocks are affected to a lesser degree. (*Nemrofsky et al.; 2006*)

AIM OF THE WORK

The aim of this work is to study and implement the different surgical treatment options, as well as the modifications brought to the different surgical techniques, for the management of lower body deformities, to provide a more pleasing lower body contour after successful massive weight loss.

This thesis will focus on lower body deformities in the massive weight loss patient, including the lower trunk, gluteal region, and the thighs.

OBESITY

Obesity is not a cosmetic problem, nor does it occur from a lack of willpower. Obesity is a disease, a life-threatening and progressive disease. The disease of obesity is now considered a worldwide epidemic, affecting over 1.7 billion people. (*Allison et al.; 1999*)

DEFINITION AND CLASSIFICATION

Obesity is defined as excess body fat. This fat can be distributed equally all over the body or concentrated in a particular region. There are gender differences in body fat distribution. Males have less body fat, which is distributed around the waist and is called *android*; thus in obese males fat is distributed in the upper body. Females deposit fat around their thighs and buttocks, which is called *gynoid*; obese females tend to deposit fat in their lower body. (*Klein et al.; 2002*)

Three basic methods are used to define overweight or obese states: (1) life insurance tables; (2) relative weight calculations determined by dividing a person's actual weight by his/her desirable weight; and (3) body mass index (B.M.I.), which is the most commonly used method for determining a patient's weight status. Although B.M.I. is used for both males and females, it is less reliable in males, especially those with very muscular bodies, because it does not distinguish between lean muscle and body fat. (*Klein et al.; 2002*)

How to determine Body Mass Index?

When using kilograms and meters:
$$\text{B.M.I.} = \frac{\text{Weight in kilograms}}{(\text{Height in meters})^2}$$

When using pounds and inches:
$$\text{B.M.I.} = \frac{\text{Weight in pounds}}{(\text{Height in inches})^2} \times 703$$

	Obesity class	BMI (kg/m ²)	Risk
Underweight		<18.5	
Normal		18.5-24.9	Normal
Overweight		25.0-29.9	Increased
Obesity	I	30.0-34.9	High
	II	35.0-39.9	Very high
Extreme obesity	III	≥40.0	Extremely high

Table (1): B.M.I. Classification scheme (*Klein et al.; 2002*)

The BMI classification scheme for weight status is based on data obtained from large epidemiological studies that evaluated the relationship between BMI and mortality and provides a mechanism for identifying patients who are at increased risk for having or developing adiposity-related complications. Both men and women who have a BMI ≥30 kg/m² are considered obese and are generally at higher risk for adverse health events than are those who are considered overweight (BMI between 25.0 and 29.9 kg/m²) (*Troiano et al.; 1996*)

BMI values should be considered as one component of an assessment of adiposity-related disease risk and not the absolute criterion for determining clinical care. (*Stevens et al.; 1998*)

In adults, the relative risk of death associated with increasing BMI decreases with increasing age. These data have been misinterpreted as demonstrating that obesity is less harmful in the elderly than in young and middle-aged adults. However, the absolute mortality risk associated with an increased BMI actually increases with age, up to the age of 75 years, because of the marked increase in mortality with advancing age. Therefore, from a clinical perspective, the health complications associated with obesity increase linearly with increasing BMI until the age of 75 years. (*Kassirer et al.; 1998*)

BMI related risk modification

In general, the higher the BMI, the greater the risk of adiposity-related diseases and premature mortality. However, other factors, such as fat

distribution, weight gain since young adulthood, level of fitness, and ethnic background modify BMI-related risk. (*Calle et al.; 1999*)

Fat distribution: The importance of fat distribution on health was first realized about 50 years ago, but was not fully appreciated until the early 1980s. (*Kissebah et al.; 1982*)

Compared with obese persons who have predominantly increased lower body fat (gluteal and femoral fat) phenotype, obese persons with excess upper body fat (abdominal subcutaneous and visceral fat) phenotype are at increased risk for diabetes, hypertension, dyslipidaemia, and ischemic heart disease. (*Pouliot et al.; 1994*)

The Expert Panel on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults proposed that men with a waist circumference greater than 102 cm (40 inches) and women with a waist circumference greater than 88 cm (35 inches) are at increased risk for metabolic diseases. (*Gallagher et al.; 2000*)

Weight gain: Data obtained from epidemiological studies suggest that a gain of 5 kg or more in body weight since the age of 18 to 20 years increases the risk of developing cholelithiasis, diabetes, hypertension, and coronary heart disease (CHD) in both men and women. Even lean adults (BMI 18.5 to 24.9 kg/m²) have an increased risk of these medical illnesses if they have gained more than 5 kg since young adulthood. (*Rimm et al.; 1995*)

Fitness: Aerobic fitness can modify the risk of developing diabetes or cardiovascular disease associated with obesity. (*Wei et al.; 1999*)

Ethnicity: The cut-off values for BMI-associated risk vary by ethnic group. (*Mckeigue et al.; 2000*)

PREVELANCE OF OBESITY

In the last 20 years, the prevalence of obesity has increased markedly in industrialized and nonindustrialized countries, and it is estimated that there are now more than 500 million overweight and 250 million obese adults in the world. (*Bouchard; 2000*)

Obesity-related diseases that typically are seen in adults, such as type 2 diabetes mellitus, hyperlipidaemia, hypertension, orthopaedic complications,