Post Bariatric Surgery Abdominoplasty

Meta-Analysis

FOR PARTIAL FULFILMENT OF MASTER DEGREE

IN General Surgery

Postgraduate Student: Ahmed Khaled El Demerdash Noweir

Degree: M.B.B.Ch, Faculty of Medicine - October 6 University

DIRECTORS

Prof. Alaa Abbas Sabry

Prof. Of General and Bariatric Surgery

And head of bariatric surgery department

Ain Shams University

Prof. Ahmed Ali Hassan

Prof. Of Plastic, Burn and Maxillofacial Surgery

Ain Shams University

Co-DIRECTOR

Dr . Medhat Mohamed Helmy

Lecturer Of General And Bariatric Surgery

Ain Shams University

Faculty of Medicine
Ain Shams University
2019

ACKNOWLAGEMENT

First thanks to Allah to whom I relate any success in achieving any work in my life.

I wish to express my deepest thanks, gratitude and appreciation to Prof. Alaa Abbas Sabry, Professor of General Surgery Faculty of Medicine, Ain Shams University for his meticulous supervision, kind guidance, valuable instructions and generous help.

Special thanks are due to Prof. Ahmed Ali Hassan, Professor of Plastic surgery, Faculty of Medicine, Ain Shams University for his sincere efforts, fruitful encouragement and endless support.

I am deeply thankful to Dr. Medhat Mohamed Helmy, Lecturer of General Surgery Faculty of Medicine, Ain Shams University for his great help, outstanding support, active participation and guidance.

I would like to express my gratitude to everyone who in various ways contributed to the completion of this project.

Finally, I would like to thank my family, for endless patience and positive thinking.

Ahmed khaled Noweir

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INTRODUCTION

Abdominoplasty is one of the most common procedures performed to improve contour of the abdomen, it's performed for either reconstructive or aesthetic purposes especially after massive weight loss. In 2010 the American society of plastic surgeons ranked abdominoplasty as the fifth of the top ten aesthetic surgical procedures **(ASPS,2010)**. According to the American Society for Aesthetic Plastic Surgery's 2016 Cosmetic Surgery National Data Bank Statistics, the number of abdominoplasty procedures performed has increased approximately 434% since 1997**. (ASPS,2016).** Abdominoplasty has become a popular aesthetic procedure in Egypt Although national statistics are lacking.

The term Obesity is defined as having a body mass index (BMI) greater than 30 kg/m2, obesity has reached epidemic proportions mainly because of poor diets and sedentary lifestyles. **(NHLBI,2000)**. The fast increase in obesity has been followed by the growth in the demand for plastic surgery in formerly obese patients. Weight loss is accompanied by new dysfunctions and disorders of the outline of the body that affects the quality of life. Generally, the vision of the

abdominal apron is the first abdominal disorder faced by the patient who underwent post-bariatric surgery **(Datta et al.,2006).**

Post-bariatric patients are particularly at risk of psychiatric disorders due to longstanding social discrimination and social isolation, leading to emotional lability. The goal of bariatric surgery is not only weight reduction and associated physical comorbidities, but also improved psychosocial functioning and quality of life**. (Van Hout ,et al., 2006)**

Massive weight loss (MWL) is defined as 50% or greater loss of the *excess* weight. The contour deformities after bariatric weight loss encompass diverse and unexpected manifestations that potentially involve every area of the body. After a rapid and massive weight loss, there is a sudden change in BMI which leads to skin excess and poor skin tone. There is often a *'deflated appearance'* more pronounced in the breasts, buttocks and the face. The skin and the soft tissues fail to retract completely and become redundant, collapsing inferiorly and inferomedially from the characteristic areas of fat deposition. *In the lower trunk*, the redundant tissues of the lower abdomen and the pubic area fall directly towards the inner thighs. There can be enormous overhanging pannus that disrupts the silhouette. The collapse of the redundant tissues from the lower abdomen, mons pubis, buttocks as well as from the medial thigh itself contribute directly to the excess tissues

along the thighs resulting in both a vertical and horizontal tissue excess. Striae are present throughout the torso. Often there is pain, irritation and intertrigo under the massive skin folds. **(Shermak et al.,2006)**

Song et al. (2005), have designed an inclusive and illustrative classification system "**Pittsburgh rating scale"** that helps in systematically assessing and quantifying the level of deformities in each particular region. Ten anatomical areas delineated for analysis include arms, breasts, abdomen, flank, mons, back, buttocks, medial thigh, hips/lateral thighs, and lower thighs/ knees. A four-point grading scale is designed for each region: grade 0- normal range, grade 1-mild deformity, grade 2-moderate deformity, and grade 3-severe deformity. Generally, a mild deformity would require non-excisional or a minimally invasive procedure; a moderate one would need an excisional procedure while a severe deformity would require combinations of excision, lifting and would involve large areas of undermining. The Pittsburgh rating facilitates the preoperative planning and is a useful tool in quantifying the improvement in appearance attributable to surgical manipulation.

The biological mechanisms causing development of excess skin after weight loss is not clear. The connective tissue of the skin is made up mainly of collagen and elastic fibers. Elastic fibers are complex extracellular matrix protein polymers consisting mainly of the protein elastin. Collagen also consists of long protein polymers. Collagen fibers are inelastic, with a tensile strength greater than steal. Collagen gives the skin mechanical and structural strength, while the elastic fibers are responsible for the elastic properties of the skin. The natural aging of the skin, which resembles the appearance of skin after massive weight loss, is also worth studying to increase the understanding of the biology behind the development of excess skin. During aging, the synthesis of collagen and elastin decrease and the skin becomes thinner and less elastic **(Oikarinen A.,1994)**. Studies in a limited number of post bariatric patients have shown histological changes in the dermis including degradation of collagen and elastin **(Migliori FC et al., 2010)**. It has earlier been shown that the density of collagen of the skin of obese individuals does not differ from the skin of those who are non-obese. **(carlos junqueira jc,1992)**

Abdominoplasty merits are great as it will restore a flat tummy, that is rigid and well set, helps to trim the waist to one's desired size, eliminates unwanted skin lesions and the skin imperfections that exists on the stomach, improves the psychological well-being of the patients

who are dissatisfied by their current body shape, but it has also some pitfalls as permanent scar (located in the bikini area) that usually does not go fade, but this can easily be covered up by clothes, or even bathing suits, since postbariatric abdominoplasty has become widely performed in the last years, this study was designed to review the different surgical techniques with meta-analysis of the merits and pitfalls of the different techniques.

More attention should be paid when performing postbariatric abdominoplasty with MWL.Concerning the vascularity of the abdominal skin further 2ry procedure excising skin recoil after abdominoplasty should be in mind and discussed with every patient.

AIM OF THE WORK

Meta-analysis study of post bariatric abdominoplasty comparing between the different techniques to reach a point of view to get the best results and reduced complications.

ANATOMY OF NORMAL ABDOMINAL WALL VERSUS POST BARIATRIC CHANGES

The Normal Anatomy of the abdominal wall

The abdominal wall consists of multiple layers (Fig.1) " from exterior to interior" :Skin, Superficial fascia including superficial fatty layer (camper's) and deep membranous layer (Scarpa's), Muscle layer and Fascia Transversalis **(Fig.1) . (Rozen, Ashton, 2008)**

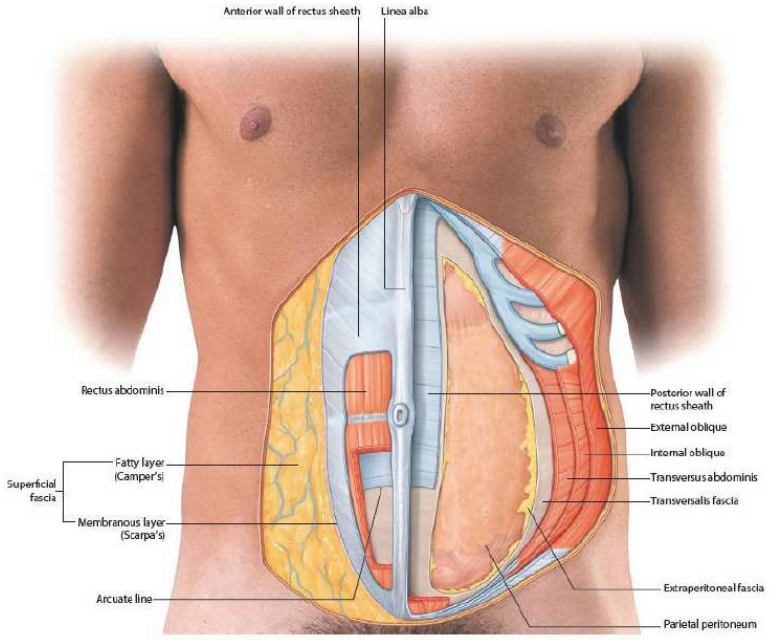

Fig. (1): Layers of the abdominal wall (Richard Tibbitts , Richardson,2015)

I. Skin and Subcutaneous tissue

The skin is thinner than that of the back, and is relatively mobile over the layers except at the umbilical region, where it is fixed. **(Vishy ,2012).**

II.Fascia

The superficial fascia passes a rich blood supply to the anterior abdominal wall. There are contributions from musculocutaneous perforators, segmental subcostal, lumbar, and the superficial inferior epigastric arteries (Fig. 2). It may be as thin as 0.5 in or less, or a thickness of greater than 6 in. Above the umbilicus, the superficial fascia consists of one layer. Below the umbilicus, the fascia divides into two layers: Camper's fascia, a superficial fatty layer, and Scarpa's fascia, a deep membranous layer **(Fong et al., 2004)**.

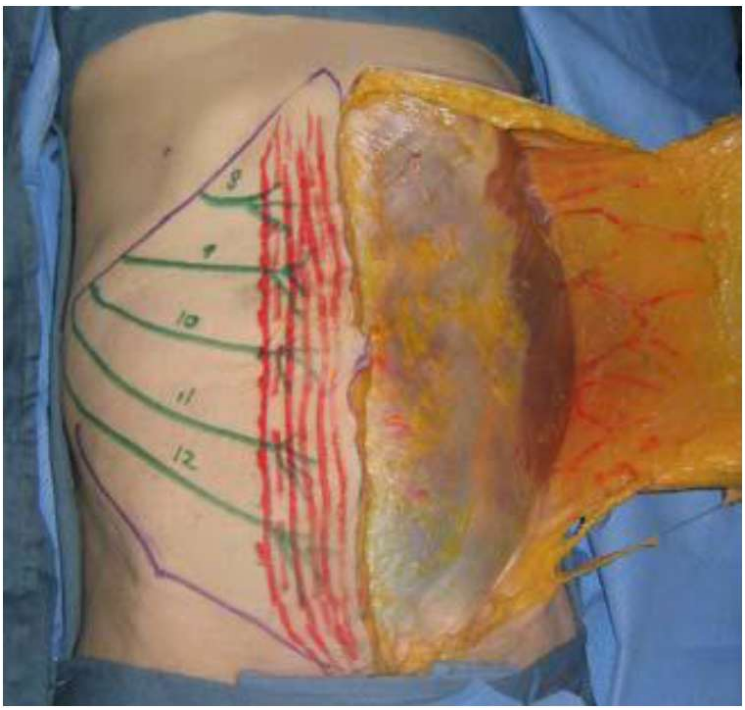

Fig. (2): Cadaveric dissection demonstrating the subcutaneous tissues and the relative nervous (Grevious et al., 2006).

The abdominal subcutaneous fat thickness, which is separated by Scarpa's fascia, is highly variable. The superficial inferior epigastric artery and vein bundles are located between these two layers. The clinical relevance of this anatomy is appreciated when designing superficial inferior epigastric artery (SIEA) flaps. The SIEA flap has been used as a delayed interpolation flap for hand reconstruction or as a free flap in breast reconstruction **(Cunningham et al., 2004)**.

The deep fascia is a thin, tough layer that surrounds and is adherent to the underlying abdominal muscles. Each abdominal muscle has an aponeurotic component that contributes to the deep fascia. The individual abdominal muscles are described in the following section **(Grevious et al., 2006).**

III. Musculofascial layer

There are five paired muscles of the abdominal wall: three flat muscles and two vertical muscles. The three flat muscles are the external oblique, internal oblique, and the transversus abdominus (Fig. 3). The three-layered structure, combined with extensive aponeuroses, works in