The Egyptian Journal of Hospital Medicine (July 2018) Vol. 72 (10), Page 5455-5560

Formal Abdominoplasty versus Mini-Abdominoplasty Post Laparoscopic Sleeve Gastrectomy

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ABSTRACT

Background: obesity nowadays is associated with comorbidities that double folded the mortality as cancer, cardiovascular disease, and diabetes. And weight loss by dietary changes and exercise usually does not achieve the desired weight loss goals. As such, bariatric surgery has become the treatment of choice for obesity and co-morbidities. Body contouring and specially abdominoplasty after bariatric surgery is a component in the treatment of the obese patient and is well accepted by patients, despite the extensive scarring with all of the surgical procedures. There is evidence that post–bariatric surgery patients who have subsequent body contouring surgery maintain their weight loss. **Aim of the Work**: to compare between formal and modern mini-abdominoplasty after laparocopic sleeve gastrectomy. **Patients and Methods:** this comparative study included two groups of thirty patients each, group I consisted of patients with redundancy at the ventral part of the abdomen after weight loss stabilization at BMI 30 for more than 6 months post laparoscopic sleeve gastrectomy, where formal, traditional, abdominoplasty was done to them. While group II consisted of patients with redundancy at the ventral part of the abdomen after weight loss stabilization at BMI 30 for more than 6 months post laparoscopic sleeve gastrectomy, where modern mini-abdominoplasty was done to them. **Results:** as regarding Flank fullness post Abdominoplasty Group I resolved the flank fullness except for 10 while Group II 20 cases still with flank fullness, therefore there was statistical significant difference between the two groups as (p value) = 0.009823. As regarding upper abdominal wall bulge condition resolved successfully in 27 cases from group I and only 10 from Group II, therefore there was statistical significant difference between the two groups as (p value) = 0.000006. **Conclusion:** abdominoplasty gives the patient seeking weight loss the encouragement and well to lose more weight and improve his psychological state, traditional abdominoplasty provide a comprehensive treatment of abdominal wall redundancy, even in the most severe cases, the patients get both functioning and cosmetic improvement. Mini-abdominoplasty is less effective, not appropriate method to treat patients with lipodystrophy of the trunk and fullness of the flanks post laparoscopic sleeve gastrectomy and bariatric surgeries.

Keywords: Study and compare formal, traditional, abdominoplasty and mini, abdominoplasty post laparoscopic sleeve gastrectomy.

INTRODUCTION

Obesity nowadays is associated with comorbidities that double folded the mortality as cancer, cardiovascular disease, and diabetes [(1)]. And weight loss by dietary changes and exercise usually does not achieve the desired weight loss goals [(1)]. As such, bariatric surgery has become the treatment of choice for obesity and co-morbidities [(2)]**.** Guidelines recommend bariatric operation for morbidly obese patients, defined as those with a body mass index (BMI) - 40 or patients with a BMI - 35 who have associated comorbidities. And the current surgical options for Bariatric Surgery: restrictive procedures like vertical banded gastroplasty (VBG), adjustable gastric banding (AGB), sleeve gastroectomy (SG), malabsorptive procedures like: jejunoileal bypass, biliopancreaticdiversion, duodenal switch procedure (DS) and combined procedures like gastric bypass, minigastric bypass. The doctor chooses the suitable operation to his patient according general condition and acceptability of patient body to the operation type [(3)]. Following massive weight loss thanks to Bariatric surgeries, a new deformity has emerged. The patient often experience soft tissue deflation with excess folds of redundant skin and subcutaneous tissue that fails to retract and hangs from the torso, abdomen. This excess skin redundancy can lead to both physical and psychological problems. Hanging skin folds can impede movement and make it difficult to exercise. Skin may become macerated and prone to recurrent infection in the intertriginous areas hooded by overhanging tissue. Patients are often embarrassed by their new body shape and avoid undressing in front of people, which has an impact on relationships. Despite successful weight loss following bariatric surgery, a patient's body image,

Received:21/6/2018
Accepted:30/6/2018

psychological and Physical state may actually deteriorate [(4)]. So, patients seek body contouring and specially abdominoplasty surgery because many are deeply distressed by their appearance. These patients should be no less than 12 to 18 months after bariatric surgery, be stable in weight for 3 to 4 months, have a body mass index of less than 30, and be well-nourished, with no protein or vitamin deficiencies. Proceeding before these criteria are met can result in recurrent skin laxity and delayed wound healing and may be inconsistent with the patient's health insurer's requirements [(5)]. A survey was conducted in 2011 of UK Bariatric Surgeons to determine the pre-operative counselling that patients receive on this issue, their opinions towards post-bariatric surgery body contouring, and Results concluded that The NICE guidelines on obesity recommend that patients undergoing bariatric surgery should have information on post-bariatric body contouring surgery to improve the comprehensive treatment of these patients [(6)]. One of the most popular body-contouring procedures is abdominoplasty; the aim of postbariatric abdominoplasty was to remove the excess of skin and redundant fat in order to recreate a slim profile. And being done after bariatric surgery is different from similar procedures in those who have not been obese. The deformity after bariatric surgery is more severe because the skin damage and associated loss of tone and elasticity do not recover, and the laxity is global. That's why the surgery should be considered a reconstructive rather than an aesthetic one. So, body contouring and specially abdominoplasty after bariatric surgery is a component in the treatment of the obese patient and is well accepted by patients, despite the extensive scarring with all of the surgical procedures. There is evidence that post–bariatric surgery patients who have subsequent body contouring surgery maintain their weight loss [(7)]. It is often difficult to predict where on the body these deformities will materialize in a given patient only hypothesis. The wide breadth and variety of deformities allow numerous surgical options. As Laparoscopic Sleeve gastrectomy today is the fastest-growing weight loss Bariatric surgery option done producing successful and sustained weight loss. We will focus in this study on comparing between formal and mini-abdominoplasty after laparoscopic sleeve gastrectomy.

AIM OF THE WORK

To compare between formal and modern mini-abdominoplasty after laparocopic sleeve gastrectomy.

PATIENTS AND METHODS

Type of Study: Prospective, comparative study. This study includes sixty patients with abdominal wall redundancy after laparoscopic sleeve gastrectomy. All the patients were examined as regards age, sex, weight, height, BMI, general examination, co-morbidities & associated ventral hernia. The patients were allocated into two groups of thirty patients each, depending on which type of Abdominoplasty the group will undergo: **Group I:** will undergo formal Abdominoplasty. **Group II:** will undergo Mini Abdominoplasty **Study Period:** 6 months. **Inclusion Criteria:** Age 18-40 years old. Post laparoscopic sleeve gastrectomy Patients, Infra-umbilical abdominal skin folds, 12 to 18 months after gastric sleeve surgery, be stable in weight for 3 to 4 months, Have a body mass index of less than or equal 30. **Exclusion Criteria:** Previous abdominoplasty, unstable body weight. Bleeding tendency, Cardiac problems, Renal Problems, Pulmonary problems, Abdominal wall hernia. **Study Site:** Outpatient clinic at Ain-Shams University. **Sample Size:** 60 patients. **Ethical Considerations:** Approved by Ethical Committee of Ain-Shams University. **Informed consent:** This was obtained from every patient, including explanation of the procedure, information about possible risks and the expected complications. **Preoperative evaluation of every patient included: Medical history: The history also covered the following:** Number of children and history of cesarean sections. History of other abdominal surgeries. History of bariatric surgeries. History of abdominal hernias. Exercise routine. **Respiratory history**: asthma, smoking, sleep apnea. Weight/diet history. Calculation of BMI: weight in kilograms/(height in meters)^2. **Physical examination:** Physical examination was conducted with the patient not only in the supine position and standing positions, but when sitting. The sitting position is often the only posture in which one can see the areas of redundancy in the patient who primarily demonstrates abdominal wall protrusion.

RESULTS

Table (1): BMI range and mean before sleeve and before Abdominoplasty and after abdominoplasty

Group	BMI Range before Sleeve	BMI Mean before Sleeve	Stable BMI Range before Abdominoplasty	Stable BMI Mean before Abdominoplasty	BMI Range 6 months after Abdominoplasty	BMI Mean 6 months after Abdominoplasty
I	36-47	40.3	27-30	29.6	22-30	25.2
II	36-45	39.3	28-30	29.5	23-28	25.3
Total	36-47	39.8	27-30	29.5	22-30	25.3

Table (2): Medical problems of the population.

Group	DM	Hypertension	Smoker
Group I	9	11	8
Group II	7	11	3
Total	16	22	11

Table (3): Post operative complications

Groups	Group I	Group II	Total	P value
Hematoma	5	5	10	1
Seroma	21	19	40	0.5839
Infection	3	0	3	0.2373
Skin Flap necrosis	3	0	3	0.2373
Flank Fulness post operative	10	20	30	0.009823
Upper abdominal bulge resolved	27	10	32	0.000006

DISCUSSION

Obesity is an increasing worldwide problem associated with adverse health effects and decreased life expectancy. The prevalence of obesity is increasing rapidly in most industrialized countries and it is known that obesity is associated with increased risk of cardiovascular morbidity and mortality. Obesity is growing at an alarming rate. Thus, investigation into the aetiology, comorbidities, and treatment of obesity has burgeoned in recent years. While novel therapies—both behavioral and pharmacological—have been developed and tested, the mean weight losses achieved with nonsurgical approaches have remained virtually unchanged over the past 20 years. Fortunately, the modest weight losses achieved with these methods are associated with significant reductions in obesity-related health problems. With the most intensive available treatment (i.e., bariatric surgery), many patients achieve remission of comorbid conditions [(1)]. The surgical treatment of morbid obesity has gained popularity with the development of the gastric bypass operation and the advent of laparoscopic bariatric procedures. Bariatric surgery has evolved as a very effective therapy for morbid obesity. Patients who undergo bariatric surgery lose an average of 40 to 84% of their excess weight over 12 to 18 months [(8)]. Bariatric surgery improves abnormal lipid levels, controls hypertension, and reduces the risk of diabetes by as much as 75%. Overall, mortality from obesity-related problems can be decreased as much as 24%. After such dramatic weight loss, patients are usually left with redundant skin [(9)]. Patients with redundant skin and subcutaneous tissue have problems of hygiene and skin irritation and also make a person physically unattractive. Redundant tissue can lead to pain, intertrigo, problems of hygiene and decreased activity [(10)]. Body contouring in a patient who has massively lost weight is generally not considered a single stage procedure. Massive weight loss leads to similar changes of the abdomen, hips, thighs, flanks, etc., creating the pear-shaped habitus. The majority of post-bariatric patients has multiple procedures such as abdominoplasty, breast reduction, mastopexy, brachio-plasty, thigh lift or liposuction, usually not all performed at the same time. Among these, the abdominoplasty has an essential role in the body image recovery [(11)]. There is evidence that post–bariatric surgery patients who have subsequent body contouring surgery maintain their weight loss [(7)]. So this study was carried out to compare formal Abdominoplasty and Mini-Abdominoplasty effect on 60 patients undergone laparoscopic sleeve gastrectomy and see if there was effect on weight loss progress among those patients, 30 patients performed formal Abdominoplasty and 30 patients performed mini-abdominoplasty. Previous studies considered formal Abdominoplasty as an option for post body weight loss body contouring as well as many other Abdominoplasty techniques, as belt lipectomy, lower body-lift, and circumferential torsoplasty [(10,12)]. But there was no study taking mini-Abdominoplasty as an option for post body weight loss body contouring. "This procedure, Miniabdominoplasty, is much less commonly performed than full abdominoplasty because most patients presenting for abdominal contouring has gained significant weight and /or have had several pregnancies, resulting in excess skin laxity, striae and muscular diastasis" [(13)]. Although mini-abdominoplasty modern technique can deal with upper abdominal wall bulge to some extend. Modern abdominoplasty techniques respect these circulatory

principles. The main principle is to operate with the most minimally invasive technique that will yield the best achievable aesthetical result. Undermining is mainly performed in the midline area anterior to the linea alba and both rectus muscles, including the median zones of adhesion first described by Lockwood and specified by ***Lockwood*** [14]**.** This study was taken to suppose if the modern mini-abdominplasty can be option in body weight loss post sleeve versus formal Abdominoplasty as most popular body contouring technique, and if it has the same effect or can encourage to loss more weight and maintain the progress of the patients after stability of weight loss for more than 6 months at BMI 30. In this study 50 female patients and 10 male patients females this doesn't' go with the work of **Sozer *et al.*** [15] who had all their 151 patients were females. And doesn't go with other workers ***Aly et al.*** [16]**, *Dini et al.*** [11] who had female to male incidence of 2:1. However, this may be attributed to the socioeconomic class of Ain-Shams patients who were the subject of this study. The mean age of the studied groups of patients in this work was 31 years a pit younger than that of ***Aly et al.*** [16]**, *Dini et al.*** [11] (43.6 years) and it was 42 years for ***Sozer et al.*** [15]. Again this difference may be attributed to the fact that in low socioeconomic classes the elderly patients are not concerned with the problem of attractiveness. A little bit more than the work of ***Sozer et al.*** [15]**, Dini *et al.*** [11]**,** traditional abdominoplasty (mean operative times was 162 minutes) but the formal technique still more than the mini Abdominoplasty (mean operative times was 121 minutes). Major complications like deep vein thrombosis and pulmonary embolism were not registered in this study. All patients in this study received prophylactic anticoagulants. Most of the studies had similar results ***Dini et al.*** [11]**, *Sozer et al.*** [15] had only one patient with postoperative pulmonary embolism despite anticoagulant prophylaxis due to Antiphospholipid Syndrome. The commonest postoperative complication in this study in both groups was seroma formation (70% in group I and 63.33% in group II). Sozer and his colleges in had a low incidence of seroma formation after traditional abdominoplasty (4%). This may be related to the fact that the magnitude of dissection in this study was more than that of ***Sozer et al.*** [15], this is because most of the patients of this study were more obese (mean body mass index was 30), while that of their studies was 26. All these patients were managed successfully by repeated needle aspiration with sterile precautions under coverage of broad spectrum antibiotics; also abdominal binder was applied (day and night). This incidence was correlated to systemic factors in the patients as bleeding tendency, drug intake (aspirin), diabetes, increased BMI, and the plane of flap dissection; the more superficial the plane as in sub and supra-scarpal dissection, the less the incidence of seroma, the same results was mentioned by Khan.[21]. More or less similar to that of this study (40%) and any minor difference was due to the degree of dissection, as the body mass index for patients of this study was 34 in comparison to 32 in **Dini *et al.*** [11]**.** Partial wound dehiscence in this study was encountered in 10% of patients of group I and didn't occur in any of patients of group II which is lower than that of ***Aly et al.*** [16]**, Dini *et al.*** [11] (18%) and much higher than that of ***Sozer et al.*** [15] (3%), again this is due to the higher body mass index in this study. The aesthetic umbilicus is an essential golden goal in the operation of abdominoplasty. A goal that is achieved mainly by the island pedicle flap technique performed with any type of Abdominoplasty except for mini-abdominoplasty. The limitation of this technique is mainly due to factors related to umbilical preoperative disorders essentially paraumbilical hernias that impair the vascularity of the island umbilicus and forced us to make a neo-umbilicus and this type of patients were excluded from these studies. Only in mini-abdominoplasty, the technique and decision of the short incision will affect the aesthetic shape of the umbilicus. Many authors pointed out that the incidence of postoperative complications increases with increased body mass index [17,18]. However, as what happened in this study, all these authors concluded that all these complications resolved with minor treatment and follow up within 3 weeks [11,15]**.** The patients in this study had no long hospital stay (mean time for hospital stay was 3 days for both groups) which was similar to other studies. Most minor postoperative complications could be managed in out patient clinic [17,18]**.** The mean hospital stay in both groups of this study was the same 3 days for both groups. So the addition of circumferential abdominoplasty did not change the hospital stay. Also the rest time when they get home was the same (3 weeks). Dini and his colleges [11] in 2008 had identical results. The skin flap necrosis occurred in 3 cases from the whole population, they

were from group I and their educational level was noticed to be illiterate, 2 of them were diabetic only and 1 was smoker and Hypertensive. Wound infection was encountered in 13 patients in this study, which was treated by intra-venous antibiotics and wound drainage. It has been documented by clinical and experimental studies that cigarette smoking has adverse effects on wound healing and surgical results of different surgical procedures [(19)]. The findings in this study showed a positive effect of cigarette smoking on wound complications following abdominoplasty which is consistent by these documented studies. The last factor in our practical estimation of the results of the techniques used is the patient satisfaction, although may not be based on a scientific base, yet it represents a golden goal in the practical work. It is noted that the preoperative counseling and proper adjustment of the patient's expectations was very essential in improving the scores of satisfaction in the study that exceeded 70% of overall patients studied. As a whole all patients in this study were uniformly pleased with their results. They were pleased with their new image. Besides, all the patients with preoperative symptoms and back pain noted an improvement after their abdominoplasty. Most of the authors had identical results [(20)].

CONCLUSION

Abdominoplasty gives the patient seeking weight loss the encouragement and well to lose more weight and improve his psychological state, traditional abdominoplasty provide a comprehensive treatment of abdominal wall redundancy, even in the most severe cases, the patients get both functioning and cosmetic improvement. Mini-abdominoplasty is less effective, not appropriate method to treat patients with lipodystrophy of the trunk and fullness of the flanks post laparoscopic sleeve gastrectomy and bariatric surgeries.

CONFLICTS OF INTEREST

There are no conflicts of interest.

REFERENCES

1. **Burguera B and Tur J (2015):** Medical management of obesity [Chapter 3]. In: Brethauer SA, Schauer PR, Schirmer BD, editors. Minimally invasive bariatric surgery. 2nd edition. New York: Springer.
2. **Dan AG and Lynch R (2015):** History of bariatric and metabolic surgery [Chapter 4]. In: Brethauer SA, Schauer PR, Schirmer BD, editors. Minimally invasive bariatric surgery. 2nd edition. New York: Springer.
3. **David E, Arterburn, Anita P Courcoulas (2014):** Bariatric surgery for obesity and metabolic conditions in adults, BMJ., 349:g 961.
4. **Magdaleno R, Chaim EA, Pareja JC *et al*. (2011):** The psychology of the bariatric patient: what replaces obesity? A qualitative research with Brazilian women. Obes Surg., 21(3):336-339.
5. **Münzberg A, Laque S, Yu K (2015):** Rezai-Zadeh and H.-R. Berthoud. Review Appetite and body weight regulation after bariatric surgery, Obes Rev., 16(1):77-90.
6. **Lyndsey H, Chidi E, Victoria R (2011):** Post-bariatric surgery body contouring in the NHS: A survey of UK bariatric surgeons. JPRAS Journals, 65(4):426–432.
7. **Grignaffini E, Grieco MP, Bertozzi N et al. (2015):** Post-bariatric abdominoplasty: our experience. Acta Biomed., 86(3):278-82.
8. **Sugerman HJ, Wolfe LG, Sica DA *et al*. (2003):** Diabetes and hypertension in severe obesity and effects of gastric bypass-induced weight loss. Ann Sur., 237:751-56.
9. **Obeid F, Falvo A, Dabideen H *et al*. (2005):** Open Roux-en-Y gastric bypass in 925 patients without mortality. The American Journal of Surgery, 189(3):352-6.
10. **van Huizum MA, Roche NA, Hofer SO (2005):** Circular belt lipectomy: a retrospective follow-up study on perioperative complications and cosmetic outcome. Annals of Plastic Surgery, 54(5):459-64.

11. **Dini M, Mori A, Cassi LC *et al.* (2008):** Circumferential abdominoplasty. Obesity Surgery, 18(11):1392-9.
12. **Gonzalez-Ulloa M (1960):** Correction of hypotrophy of the breast by means of exogenous material. Plastic and Reconstructive Surgery, 25(1):15-26.
13. **Hunstad JP and Repta R (2009)**: Atlas of abdominoplasty, Philadelphia, Saunders Elsevier. Available at: https:// www. elsevier. com/ books/ atlas- of-abdominoplasty/ 9781416040804
14. **Lockwood TE (1993):** Lower body lift with superficial fascial system suspension. Plast Reconstr Surg., 92:1112–1122.
15. **Sozer S, Agullo F, Santillan A *et al.* (2007):** Decision Making in Abdominoplasty, Aesth. Plast. Surg., 31:117-127.
16. **Aly AS, Cram AE, Chao M *et al.* (2003):** Belt lipectomy for circumferential truncal excess: the University of Iowa experience. Plast Reconstr Surg., 111(1):398-413.
17. **Vastine VL, Morgan RF, Williams GS *et al*. (1999):** Wound complications of abdominoplasty in obese patients. Ann Plast Surg., 42(1):34-9.
18. **Sanger C, David LR (2006):** Impact of significant weight loss on outcome of body-contouring surgery. Ann Plast Surg., 56(1):9-13.
19. **Rogliani M, Silvi E, Labardi L *et al*. (2006):** Obese and nonobese patients: complications of abdominoplasty. Annals of Plastic Surgery,57(3):336-8.
20. **Ramirez OM (2000):** Abdominoplasty and abdominal wall rehabilitation: a comprehensive approach. Plastic and Reconstructive Surgery,105(1):425-35.
21. **Khan U (2008):** Risk of seroma with simultaneous liposuction and abdominoplasty and the role of progressive tension sutures. Aesthetic. Plast. Surg., 32: 93-99.
22. **Dixon J, Egger G, Finkelstein E, Kral J, Lambert G (2015)**: Obesity paradox' misunderstands the biology of optimal weight throughout the life cycle, International journal of obesity, 39 (1): 82,92.