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Impact of Abdominoplasty on Quality of Life in Post-Bariatric and Non-Bariatric Patients: A Prospective Clinical Study

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Abstract

Background: Global obesity rates have reached alarming levels. While bariatric surgery effectively helps with weight loss, it often leads to excess skin. This prompts many patients to seek body contouring procedures like abdominoplasty, which improves the quality of life (QoL) by positively impacting body image, self-esteem, and overall well-being.

Objective: Evaluation of the outcomes and QoL following abdominoplasty in two groups: Those who have undergone bariatric surgery (post-bariatric patients) and those who have achieved significant weight loss without bariatric surgery (non-bariatric patients).

Patients and Methods: A non-randomized prospective cohort study was conducted from February 2023 over one year, involving 30 patients at Mansoura University Hospitals. They were divided into post-bariatric and non-bariatric groups (patients lost weight without surgery only with diet). Various abdominoplasty techniques, including traditional, mini-abdominoplasty, and belt lipectomy, were utilized. Preoperative assessments included medical history, physical examination, and laboratory investigations. Post-operative assessment Health-related quality of life (HRQOL) was evaluated utilizing the validated 15D instrument.

Results: The study included 30 patients, mainly females. Both groups showed significant BMI reduction post-surgery. Group I (post-bariatric) had higher incidences of excess skin and fat accumulation compared to Group II (non-bariatric). Traditional abdominoplasty was the most common technique used. Seroma was the most frequent complication. Quality of life improvements were noted particularly in the post-bariatric group.

Conclusion: Abdominoplasty significantly enhances QoL in both groups, though complications like seroma remain prevalent. The study highlights the need for personalized surgical approaches to optimize outcomes. Further research is necessary to refine techniques and improve patient care in diverse populations.

Key Words: *Post-bariatric weight loss – Body contouring-Liposuction – Traditional abdominoplasty – Quality of life.*

Ethical Committee: This study was granted approval by our Institutional Review Board (IRB) under the approval number MS. 22.12.2253. R1. All patients provided written informed consent for the use of photographic images and participation in the study. The potential risks and benefits of the surgical procedure, including the possibility of revision surgery for recurrence or complications, were fully explained to patients. Patient confidentiality was strictly maintained throughout the study.

Disclosure: No disclosure.

Introduction

Abdominoplasty is one of the most desired cosmetic surgeries globally making it the sixth most popular cosmetic procedure [1]. Obesity is one of the most pressing global health challenges, affecting approximately 604 million adults worldwide [2]. Its severe health implications span physical, psychological, metabolic, and cardiovascular domains, accompanied by substantial mortality rates. By 2030, 42% of the adult population will suffer from obesity [3]. The global obesity epidemic has prompted the development of diverse interventions, particularly in food science and bariatric surgical techniques. Bariatric surgery has emerged as an effective treatment modality for severe obesity [4]. Around 256,000 bariatric procedures are performed each year. Most weight loss happens within the first two years after surgery [5]. Abdominoplasty is used to address issues like separated abdominal muscles, excess skin, and weakness in the abdominal wall.

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As surgical techniques advance, choosing the right patient and procedure becomes more complex [6,7]. Although it's a common cosmetic surgery, attention to potential complications is crucial. Complication rates post-bariatric surgery for abdominoplasty patients range from 40% to 55% [8]. Studies show that patients who have significant weight loss and undergo abdominoplasty face higher complication rates compared to those who don't have the surgery [9]. It significantly enhances quality of life, with patients experiencing better physical and mental health. Improvements are noted in mobility, sexual life, preoperative depression, exertion, and daily activities [10]. A key goal of abdominoplasty is to improve patients' well-being and health-related quality of life (HRQOL), which includes enhancements in physical health, psychological well-being, social support, and financial aspects [11,12]. This study investigated the impact of abdominoplasty on QoL in patients with abdominal laxity, comparing those with and without prior bariatric surgery.

Patients and Methods

This non-randomized prospective cohort study was conducted at the Plastic and Reconstructive Surgery Center, Mansoura University Hospitals, from 2023 to 2024. This study was granted approval by our Institutional Review Board (IRB) under the approval number MS. 22.12.2253. R1. All patients provided written informed consent for the use of photographic images and participation in the study. The potential risks and benefits of the surgical procedure, including the possibility of revision surgery for recurrence or complications, were fully explained to patients. Patient confidentiality was strictly maintained The study population consisted of 30 patients who were stratified into two equal groups: (Group I) those who have undergone bariatric surgery (post-bariatric patients) and (Group II) those who have achieved significant weight loss without bariatric surgery (non-bariatric patients). The study participants underwent a variety of abdominoplasty techniques tailored to their individual needs and the specific characteristics of their abdominal tissue. These techniques, determined after clinical evaluation and consultation with the surgical team, included mini-abdominoplasty, panniculectomy, full abdominoplasty, or belt lipectomy. They were selected based on predetermined inclusion and exclusion criteria. Eligible patients were aged 25-55 years. Exclusion criteria encompassed patients under 18 years of age, those with contraindications to general anaesthesia (though spinal anaesthesia was considered as an alternative in select cases), heavy smokers, patients with uncontrolled comorbidities, those who declined surgical intervention, and participants unwilling to maintain follow-up throughout the study duration. Six patients were excluded from the final analysis based on these criteria (Fig. 1).

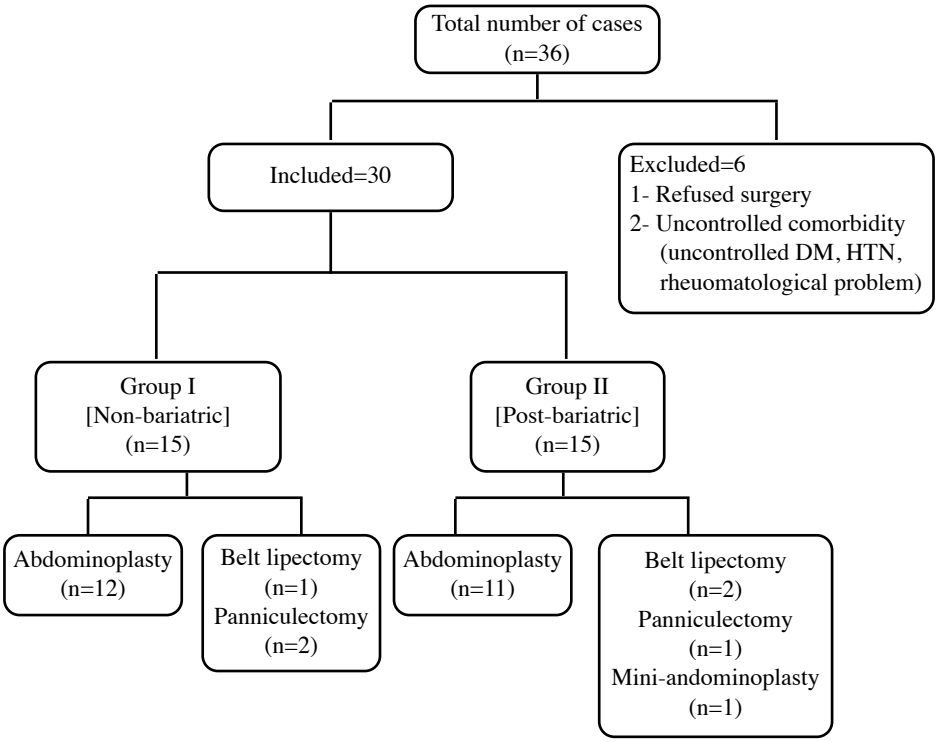

Fig. (1): Chart showing cases included and excluded in the study with different techniques.

Preoperative assessment:

All patients underwent preoperative evaluation, including detailed weight loss history documentation. For post-bariatric patients, the weight loss rate and pre/post-surgical BMI were recorded, while non-surgical weight loss patterns were documented for the non-bariatric cohort. The assessment protocol encompassed the evaluation of medical comorbidities, nutritional status, and, in female patients, obstetric history with particular attention to future pregnancy intentions. Patient expectations were thoroughly discussed and documented. The physical examination focused on quantifying subcutaneous tissue thickness, assessing rectus muscle diastasis severity, and evaluating abdominal wall laxity. Previous surgical scars were documented, and patients were examined for the presence of hernias. Standard preoperative laboratory investigations were performed, including complete blood count (CBC), liver and renal function tests, virology screening, and coagulation profile (INR).

Surgical technique:

Our surgical approaches for abdominoplasty were based on established techniques. We followed Matarasso's technique for traditional abdominoplasty **[13]** and adapted Aly's method for belt lipectomy procedures **[14]**.

Postoperative care:

Patients were positioned with 45-degree trunk elevation and knee flexion supported by pillows to minimize tension on the abdominal incision. Urinary catheters were removed on postoperative day one. Early mobilization was encouraged, with patients instructed to maintain slight forward flexion during ambulation for the initial three days to reduce incisional tension. Surgical drains were maintained for seven days, after which patients were discharged. Suture removal was performed on postoperative day fourteen.

Assessment:

1- *Photography:*

All subjects were asked to participate in a follow-up examination in our outpatient clinic. Results were documented through digital photographic imaging along 1-year intervals.

2- *Qol Assessment:*

Health-related quality of life (HRQOL) was evaluated utilizing the validated 15D instrument, a comprehensive assessment tool previously established in abdominoplasty outcome studies. The instrument evaluates fifteen distinct dimensions of health status: mobility, vision, hearing, breathing, sleep, eating, speech, excretion, vitality, sexual activity, activities of daily living, mental function, discomfort/symptoms, depression, and distress. Each dimension is quantified using a five-point Likert scale, ranging from 1 (optimal function) to 5 (maximum impairment), enabling systematic assessment of patient-reported outcomes across multiple health domains **[15,16]**.

Statistical analysis:

Statistical analysis was performed using the Statistical Package for the Social Sciences software version 22 (IBM SPSS Inc., Chicago, IL) for Windows 10. Categorial variables were expressed as percentages and continuous variables were expressed as means ± SDs (range).

Results

A total of 30 patients were enrolled in this study. The cohort was predominantly female, with approximately 23 women and 7 men. To evaluate the impact of bariatric surgery on post-abdominoplasty outcomes, patients were divided into two groups. Group I comprised 15 individuals who underwent abdominoplasty following bariatric surgery, while Group II consisted of 15 patients with no history of weight loss surgery. The mean age of participants was comparable between the two groups, with a mean of 38±12.3 SD years in Group I and 35.8±9.8 SD years in Group II (p-value=0.6). The gender distribution was also similar, with a slight predominance of females in both groups (80% vs. 73.3%, p-value=0.9).

Clinical characteristics between the study groups:

A significant reduction in BMI was observed following surgery in both groups. Group I demonstrated a mean BMI of 33.7 pre-surgery and 30.7 post-surgery (p-value=0.6), while Group II exhibited a mean BMI of 32.7 pre-abdominoplasty and 28.9 post-surgery, indicating substantial excess skin removal. A higher proportion of patients in Group I (86.7%) presented with excess skin above and below the umbilicus compared to Group II (80%). Moreover, fat accumulation was more prevalent in Group I (93.3%) than in Group II (60%). Both groups demonstrated a high incidence of diastasis recti, with 86.7% in Group I and 73.3% in Group II. The occurrence of hernia was infrequent, with only one case of fatty umbilical hernia identified in each group. Skin quality was comparable between the groups, with a majority of patients exhibiting good or fair skin quality. A history of previous abdominal surgery was reported in a significant proportion of patients, with 13.3% and 20% in Group I and Group II, respectively. Notably, a higher percentage of patients in Group I had undergone previous cesarean section (CS) compared to Group II (86.7% vs. 60%) (Table 1).

Comparative analysis of abdominoplasty surgery:

In our study, liposuction was performed more frequently in non-bariatric patients (73.3%) compared to post-bariatric patients (53.3%), although

this difference was not statistically significant (p-value=0.5). The median volume of liposuction aspirate was 1500cc in both groups. On the other hand, traditional abdominoplasty was the predominant technique in both groups (80% in Group I, 73.3% in Group II). Mini-abdominoplasty and belt lipectomy were performed in a small number of patients, primarily in the post-bariatric group (Figs. 4,5). Panniculectomy was infrequent, with only two cases in Group I and one in Group II. Regarding abdominal wall plication, vertical plication was performed in a majority of patients in both groups, with a slightly higher proportion in non-bariatric patients (80% vs. 66.7%), but again this was not a statistically significant difference (p-value=0.7). Finally, the number of drains, duration of drain insertion, and umbilical reset rates were similar between the two groups, with no statistically significant differences observed (Table 2).

Complications:

Seroma was the most frequent complication, affecting approximately half of the patients in both groups (46.7% in Group I, 53.3% in Group II). The difference between the groups was not statistically significant (p-value =0.8). Contrarily, scar complication represented the second most common issue, with a higher occurrence in post-bariatric patients (40%) compared to non-bariatric patients (20%). This difference approached statistical significance (p-value=0.4).

Wound disruption was observed in a small percentage of patients, slightly more prevalent in the post-bariatric group (13.3% vs. 6.7%), but not statistically significant (p-value=0.5). While hematoma occurred in only one post-bariatric patient (6.7%). Mesh infection was reported in one non-bariatric patient (6.7%) and was managed conservatively. No cases of DVT or umbilical necrosis were observed in either group (Table 3).

Quality of life score:

The 15D instrument, a tool used to measure health-related quality of life, revealed that patients who had undergone abdominoplasty following bariatric surgery experienced statistically significant enhancements in several key areas of their lives. These improvements were specifically noted in mobility (p-value=0.2), breathing (p-value=0.2), excretion (p-value=0.1), usual activities (p-value =0.4), and discomfort (p-value=0.3). These improvements were observed in the post-bariatric group (Group II) compared to the non-bariatric group (Group I). While not statistically significant, a slight increase in the median depression score was noted in Group II (p-value=0.06). The majority of QOL domains, including vision, hearing, sleeping, eating, speech, mental function, distress, vitality, and sexual activity, showed no significant differences between the two groups (Table 4).

Table (1): Clinical characteristics of non-bariatric and post-bariatric groups.

Variable	Non-bariatric (Group I) N=15	Post-bariatric (Group II) N=15	p-value
	N (%) / Mean ± SD		
BMI before	33.7±6.4	32.7±4.8	0.6
BMI after	30.7±6.1	28.9±4.7	0.4*
Excess skin:			
Below the umbilicus	2 (13.3)	0	0.5
Above and below the umbilicus	13 (86.7)	15 (100)	
Excess fat	14 (93.3)	9 (60)	0.08
Divarication of recti	13 (86.7)	11 (73.3)	0.7
Hernia	1 (6.7)	1 (6.7)	0.9
Skin quality:			
Fair	7 (46.7)	6 (40)	0.9
Good	8 (53.3)	9 (60)	
Previous abdominal surgery	2 (13.3)	3 (20)	0.9
Obstetric history (previous CS)	13 (86.7)	8 (53.3)	0.1

Table (2): Abdominoplasty surgery in non-bariatric & post-bariatric groups.

Variable	Non-bariatric (Group I) N=15	Post-bariatric (Group II) N=15	p-value
	N (%) / Mean ± SD		
Liposuction	11 (73.3%)	8 (53.3%)	0.5
Volume liposuction	1500 (0-2000)	1500 (1000-2000)	0.9
Plication	12 (80%)	10 (66.7%)	0.7
Technique:			
1- Mini	0	1 (6.7)	0.6
2- Belt	1 (6.7)	2 (13.3)	
3- Traditional	12 (80)	11 (73.3)	
4-Panniculectomy	2 (13.3)	1 (6.7)	
Drains number	2 (2-2)	2 (2-2)	0.6
Drain insertion duration (days)	7 (7-10)	7 (5-10)	
Umbilical reset	13 (86.7)	13 (86.7)	0.9
Hospital stays	7 (7-10)	7 (5-10)	0.5

Table (3): Complications of abdominoplasty in non-bariatric and post-bariatric groups.

Variable	Non-bariatric (Group I) N=15	Post-bariatric (Group II) N=15	*p*-value
	N (%)		
Seroma:			
No	6 (40)	6 (40)	0.8
Yes	7 (46.7)	8 (53.3)	
Minimal	2 (13.3)	1 (6.7)	
Hematoma	0	1 (7.1)	0.5
Wound disruption:			
No	14 (93.3)	12 (80)	0.5
Yes	1 (6.7)	2 (13.3)	
Minimal	0	1 (6.7)	
DVT	–	–	
Umbilical necrosis	–	–	
Scar complications:			
No	12 (80)	9 (60)	0.4
Yes	3 (20)	6 (40)	
Mesh infection	1 (8.3)	0	0.9

Table (4): Quality of life according to 15-D instrument in non-bariatric and post-bariatric groups.

Variable	Non-bariatric N=15	Post-bariatric N=15	*p*-value
	Median (IQR)		
Mobility	1 (1-2)	1 (1-1)	0.2*
Vision	1 (1-1)	1 (1-1)	0.9
Hearing	1 (1-1)	1 (1-1)	0.9
Breathing	1 (1-2)	1 (1-1)	0.2*
Sleeping	1 (1-1)	1 (1-1)	0.9
Eating	1 (1-1)	1 (1-1)	0.9
Speech	1 (1-1)	1 (1-1)	0.9
Excretion	1 (1-1)	1 (1-1)	0.1*
Usual activities	1 (1-1)	1 (1-1)	0.4*
Mental function	1 (1-1)	1 (1-1)	0.9
Discomfort	1 (1-2)	1 (1-1)	0.3*
Depression	1 (1-1)	2 (1-2)	0.06
Distress	1 (1-1)	1 (1-2)	0.8
Vitality	1 (1-2)	1 (1-1)	0.5
Sexual activity	1 (1-1)	1 (1-1)	0.9
Total QOL score Mean ± SD	16.9±2.4	16±1.1	0.2*

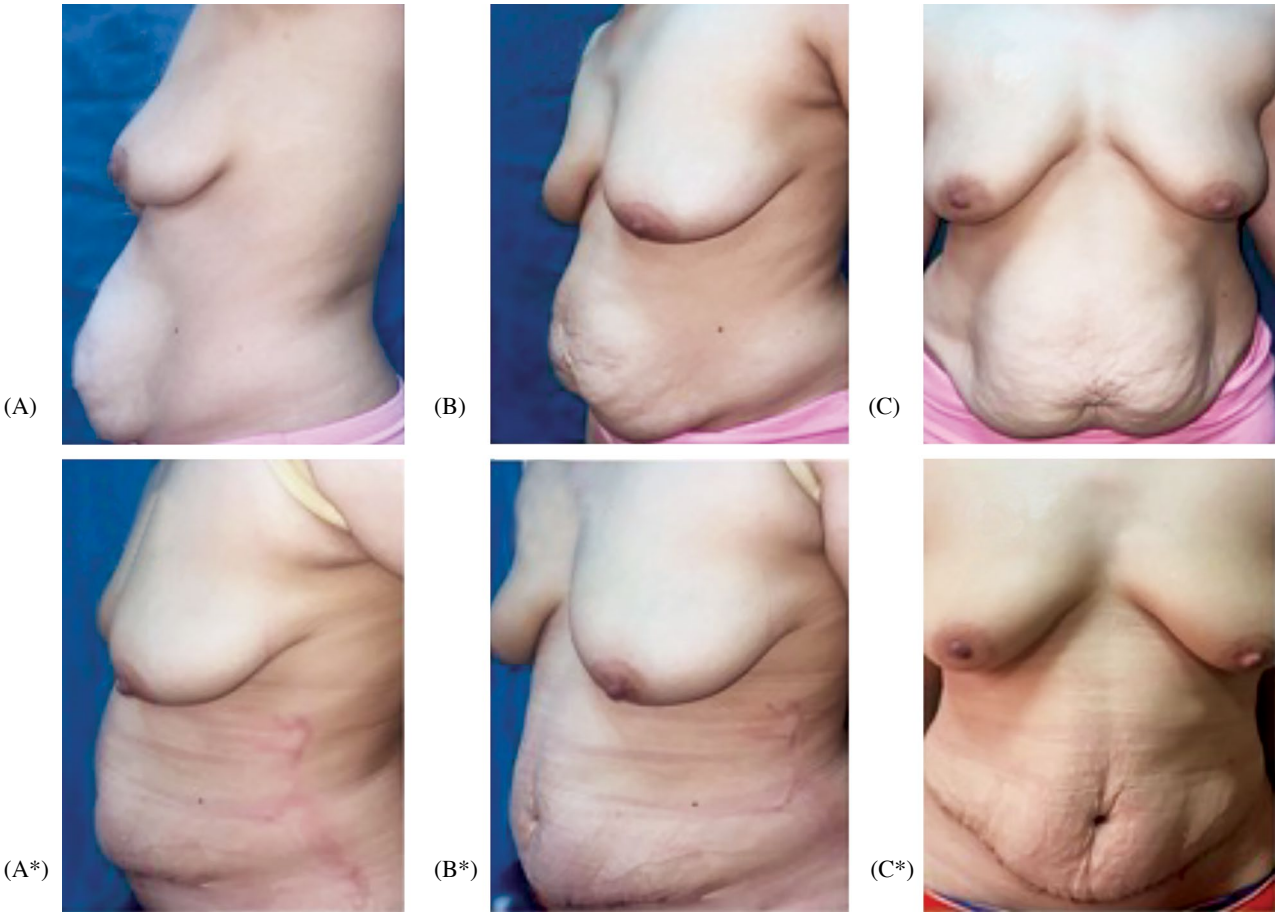

Fig. (2): Shows a 35 years-old female with a history of multiple CS with marked diastasis of recti before (upper row) and after (lower row) traditional abdominoplasty by week in different views where (A, B, C) are the preoperative views and (A*, B*, C*) are the postoperative views.

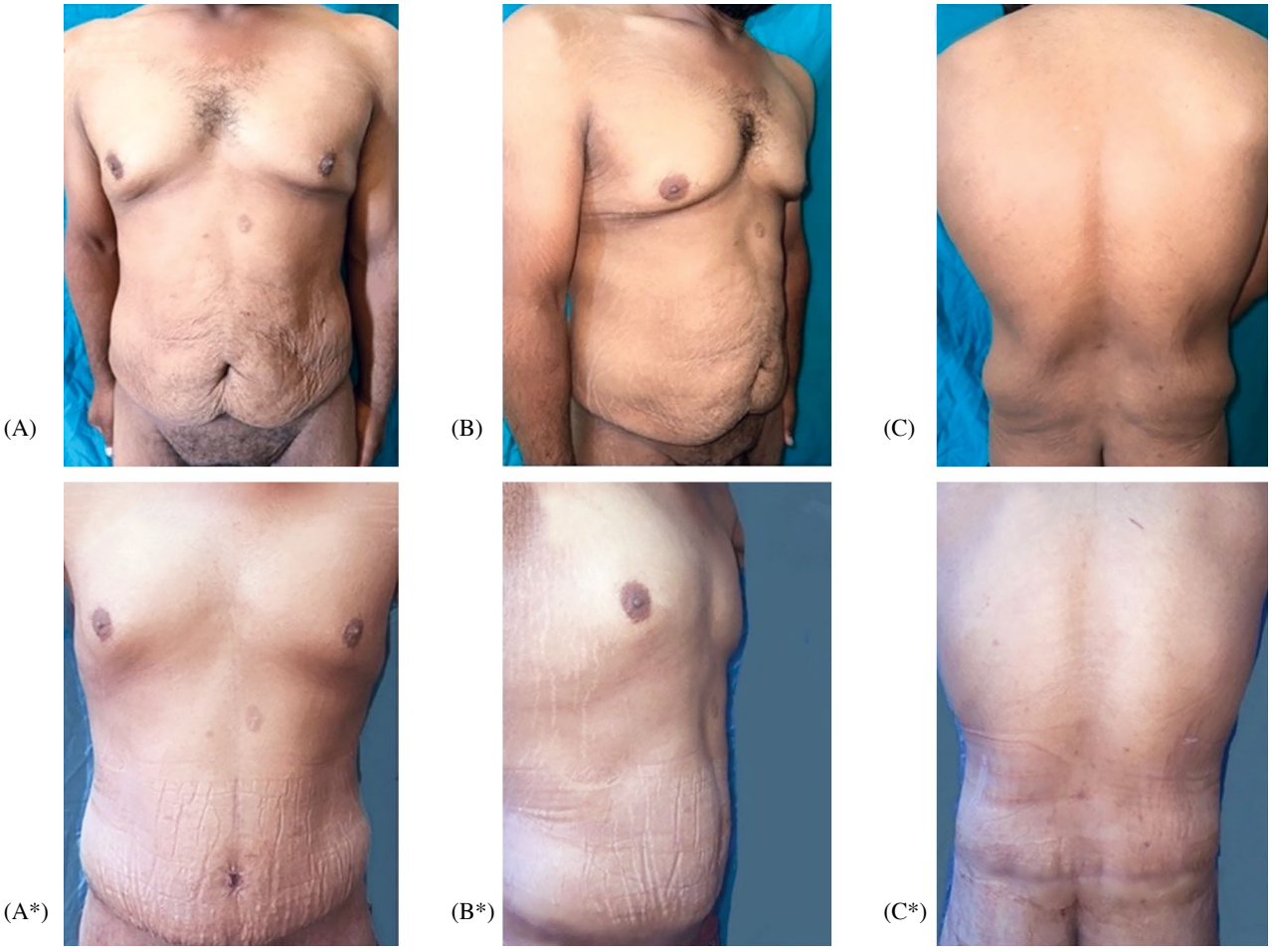

Fig. (3): Shows 40 years-old patient with a history of massive weight loss after bariatric surgery before and after belt lipectomy 3 weeks apart (A, B, C) are the preoperative views, and (A*, B*, C*) are the postoperative views.

Discussion

Global obesity rates are alarmingly high, with 39% of adults overweight and 13% obese (WHO). This chronic condition is linked to various health issues, including metabolic, cardiovascular, and psychological problems **[17]**. These could significantly impair an individual's QoL and overall well-being **[18]**. Bariatric surgery is a proven intervention for weight loss in individuals with obesity, especially those who haven't succeeded with lifestyle changes or have obesity-related health issues. Many studies have shown that it can reduce the risk of cardiovascular complications associated with severe obesity **[19-20]**. While bariatric surgery often results in substantial weight loss within the initial two years, many patients experience excess skin, which can be a concern for those seeking body contouring **[21]**. This trend, coupled with advancements in surgical techniques and a growing understanding of patient needs, has fueled significant progress in the field of abdominoplasty **[22]**.

Specifically, a surge in post-bariatric cases seeking body contouring approaches, increased awareness of the impact of body image on QoL, and a greater emphasis on holistic well-being are driving the evolution of abdominoplasty techniques **[23]**. This study investigated the impact of abdominoplasty on patients who have undergone significant weight loss, comparing those who had bariatric surgery with those who achieved weight loss through other means. The study aimed to evaluate and compare outcomes and Qol after abdominoplasty in these two groups, while also analyzing the effectiveness of different surgical techniques. This allowed us to evaluate and compare outcomes and QoL between the two groups. The results of this study demonstrate a comparable mean age and gender distribution between the two groups, indicating successful randomization in these aspects. The slight predominance of females in both groups reflects the typical demographic for this type of study, as Al-Sumaih I et al. **[24]**. While the prevalence of diabetes was higher in the post-bariatric surgery group, this difference wasn't statistically significant. This finding suggests that while bariatric surgery may contribute to improved glycemic control, it does not eliminate the risk of diabetes. Additional investigations with a larger sample size

might be needed to explore this relationship further. The similar prevalence of hypertension and smoking habits between the two groups indicates that these factors were likely not major confounders in the study. However, the relatively small sample size may have limited the power to determine minor differences in these comorbidities. In general, these results suggest that the two groups were largely comparable in baseline characteristics, strengthening the validity of the study's findings. Future research with larger cohorts could further explore the nuanced interplay of comorbidities and bariatric surgery outcomes. This study reveals significant findings concerning the impact of bariatric surgery and abdominoplasty on BMI and associated conditions. Both Group I and II experienced substantial BMI reduction, highlighting the effectiveness of both procedures in addressing weight and excess skin. On the other hand, the greater prevalence of excess skin and fat accumulation in Group I (86.7%) compared to Group II (80%) underscores the unique challenges faced by post-bariatric patients. This observation aligns with existing literature on the significant weight loss and skin redundancy associated with bariatric surgery. Interestingly, despite the higher prevalence of excess skin in Group I, a higher proportion of patients in Group II underwent previous abdominal surgery (20% vs. 13.3%). This seemingly paradoxical finding may be explained by the fact that patients undergoing abdominoplasty for cosmetic reasons may have a history of procedures like caesarean sections, which contribute to abdominal wall laxity. Notably, a higher percentage of patients in Group I had undergone previous caesarean section (CS) compared to Group II (86.7% vs. 60%). This difference may reflect the higher prevalence of obesity among women of reproductive age, who may be more likely to undergo both CS and bariatric surgery. The high incidence of diastasis recti in both groups, particularly Group I (86.7%), is a noteworthy observation. This finding aligns with many research studies, which reported a high prevalence of diastasis recti in post-bariatric patients, attributing it to the significant stretching of the abdominal wall during periods of weight gain and subsequent weight loss **[25-28]**. While both procedures effectively address BMI, the specific needs of each patient population should be considered. Bariatric surgery patients often present with more extensive skin excess and fat accumulation, potentially requiring more complex reconstructive procedures. Abdominoplasty, on the other hand, primarily targets excess skin and abdominal wall laxity, making it a suitable option for individuals with localized concerns. Patients experience varying amounts of loose skin, whether it's from pregnancy, weight changes (with or without bariatric surgery), or just weakened abdominal muscles. This specific situation is uncommon **[29]**. However, liposuction is essential for body contouring and is always included in tummy tucks. Most patients in both the non-bariatric (11 out of 15) and post-bariatric (8 out of 15) groups had liposuction during their tummy tuck.

In this study, only one patient who had undergone bariatric surgery had a mini-abdominoplasty. This patient had minimal excess fat and skin below the belly button and good abdominal muscle tone. Their procedure involved liposuction of the abdomen and removal of the extra skin without tightening the abdominal muscles (plication). This low occurrence of mini-abdominoplasty might be because most Egyptian patients in this study had significant excess weight, making more extensive abdominoplasty procedures necessary. Sozer et al., define mini-abdominoplasty as a procedure involving tightening of the abdominal muscles in three areas, removal of excess skin through a small incision, and liposuction **[30]**. This raises a question about the applicability of mini abdominoplasty in different patient populations. While it might be less common in this specific context due to the higher prevalence of excess weight and skin, it could be a valuable option for other patients with less severe abdominal laxity. Further research could explore the factors that influence the suitability of mini-abdominoplasty and compare its outcomes with more extensive procedures. It also highlights the need for personalized surgical planning based on individual patient characteristics and desired outcomes. Most patients in this study (12 in the non-bariatric group and 11 in the post-bariatric group) underwent a traditional abdominoplasty. These were patients with a moderate amount of excess fat above and below the belly button, and moderate to severe abdominal muscle separation and laxity. While this technique was common for post-bariatric patients in this study, it's less frequently used for this population globally. This is because traditional abdominoplasty may not fully address the significant excess skin often seen after massive weight loss, leading surgeons to prefer techniques like belt lipectomy which targets circumferential excess skin. Similar to other studies, traditional abdominoplasty in this research included liposuction, tightening of the abdominal muscles (plication), and repositioning of the belly button. To minimize fluid buildup (seroma formation), two drains were routinely used and removed after about 7 days **[31,32]**. This study argues that traditional abdominoplasty, including liposuction and muscle plication, remains a relevant technique for many patients, including those who have undergone bariatric surgery. The routine use of drains is highlighted as an effective method for reducing seroma formation. While acknowledging the limitations of traditional abdominoplasty in addressing extensive excess skin, particularly in post-bariatric patients, this study sparks a debate on its continued relevance. It challenges the trend towards more aggressive surgical techniques for post-bariatric body contouring, suggesting that traditional abdominoplasty may still be appropriate for certain individuals. This raises questions about

patient selection criteria, the long-term outcomes of different techniques, and the optimal approach to minimize complications like seromas. Further research comparing the effectiveness and complications of various abdominoplasty techniques in different patient populations is needed.

Belt lipectomy, initially described in 1960 [33], was subsequently popularized and modified by Al Aly et al. [14]. This procedure not only allows surgeons to tighten the abdominal muscles and tissues, but also removes excess skin from the lower back, buttocks, thighs, and hips. This leads to a more sculpted torso after significant weight loss. In this particular study, only one patient in the non-bariatric group and two in the post-bariatric group underwent belt lipectomy. These patients had so much excess skin that a traditional tummy tuck couldn't address it effectively. Postoperative complications, particularly in post-bariatric patients undergoing abdominoplasty, are a critical concern in contemporary plastic surgery literature. The correlation between higher BMI (exceeding 30kg/m^2) and increased tissue resection weight significantly elevates the risk of postoperative complications. Global research consistently identifies seroma and wound dehiscence as the predominant complications following abdominoplasty. The heightened vulnerability of post-bariatric patients to complications is evident in several studies. Greco et al.'s univariate analysis revealed a stark contrast in wound complication rates between patients with a history of weight loss surgery (41%) and those without (22%) [34]. A comprehensive review and meta-analysis indicated that approximately 31.5% of patients undergoing body reshaping surgery post-bariatric procedures experienced complications, with seroma being the most prevalent at a weighted rate of 12.7%–13.9% [31]. This study found that seroma formation was the most frequent complication following abdominoplasty, occurring equally in patients with and without a history of bariatric surgery. This challenges the common belief that post-bariatric patients are inherently more prone to seromas. These findings suggest that factors beyond weight loss history significantly influence postoperative outcomes, underscoring the need for a more comprehensive approach to risk assessment. Rather than simply categorizing post-bariatric patients as high-risk, surgeons should individually evaluate patient factors, surgical techniques, and postoperative management strategies. Notably, our conservative surgical approach, especially in post-bariatric patients, resulted in lower complication rates than global averages. This success suggests a need to reassess conventional abdominoplasty protocols for this patient population and supports individualized care and refined surgical techniques to minimize risks.

Abdominoplasty's impact on QoL is a subject of ongoing research, with numerous studies demonstrating its positive effects across various assessment methods [35-37]. This study further confirms these findings, showing that abdominoplasty significantly improves QoL, particularly in areas like mobility, physical exertion, and daily activities. These improvements, which also contribute to positive psychological effects, were especially pronounced in post-bariatric patients who often experience physical and psychological challenges following significant weight loss. The 15D questionnaire showed that these enhancements also had a positive impact on psychological well-being and overall life satisfaction. Previous research on the impact of abdominoplasty on QoL has yielded mixed results. Cook et al. (2010) found that in a study of 30 patients, abdominoplasty primarily improved sexual and daily activity, with no significant impact on psychological well-being [38]. In contrast, Saariniemi et al. (2011) conducted a larger study of 64 women and concluded that non-bariatric abdominoplasty significantly enhanced overall QoL, body satisfaction, sexual function, self-esteem, and mental health [39]. Uimonen et al. (2021) observed a lower health-related QoL in abdominoplasty patients compared to the general population, even after controlling for demographics [40]. This contrasts with El-Gharbawi et al. (2022), who found that abdominal contouring consistently improved QoL in post-bariatric patients, irrespective of the specific surgical technique [41]. Further supporting this positive trend, studies have shown that patients report improved QoL even after panniculectomy and abdominoplasty, regardless of complications or degree of obesity [42]. These varying results underscore the need for more nuanced investigations into the psychological and behavioural effects of abdominoplasty. Factors such as patient selection, surgical techniques, and the specific dimensions of QoL assessed likely contribute to these differences. While our findings show significant QoL improvements, particularly in physical function and daily activities, it's important to note that the literature presents a complex picture. Some studies have shown mixed results, while others align with our findings.

This study encountered several challenges that impacted its outcomes. The high BMI of many participants limited certain decision-making options, and difficulty ensuring patient compliance affected the follow-up results. Additionally, the study acknowledges limitations related to its small sample size, non-randomization, single-center design, and lack of long-term follow-up data, all of which could introduce bias and limit the generalizability of the findings.

Conclusion:

This study demonstrates that abdominoplasty significantly QoL in both post-bariatric and non-bariatric patients, with improvements observed in both physical and psychological well-be-

ing. However, complications, particularly seroma formation, remain a challenge. These findings underscore the critical need for individualized surgical planning and personalized approaches to optimize patient outcomes. While this study provides valuable insights, further validation through larger, multicentre studies is warranted. Future research should prioritize technique optimization, complication reduction, and outcome enhancement across diverse patient populations to refine evidence-based protocols and advance the evolving field of body contouring surgery.

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