



Aesthetic Lipoabdominoplasty: Comparative Study between Progressive Tension Suture Techniques versus Classic Lipoabdominoplasty

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ABSTRACT

Background: An abdominoplasty aims to treat the three primary components of an anterior abdominal wall deformity: the musculoaponeurotic layer, the skin, and the fat. The aim of the study is to decrease the incidence of complication (hematoma-seroma-infection) of lipo abdominoplasty, evaluate the effect of progressive tension suture technique in lipo abdominoplasty, and patient expectation and satisfaction. **Methods:** This Prospective clinical study was carried out on 30 patients at the Department of Plastic & reconstruction Surgery, Faculty of Medicine, Zagazig University, and lasted 6 months. **Results:** There is a statistically significant increase in operation time among Group I compared with Group II. Also, there was a statistically significant decrease in hospital stays among Group I compared to Group II. $P < 0.05$, there was a statistically significant increase in the frequency of complications among Group II compared with Group I $P < 0.05$. The most frequent complication among Group II was seroma (4 cases), as well as there was a statistically significant increase in scar quality and patient satisfaction among non-complicated cases compared to complicated cases in Group II $P = 0.003$. **Conclusions:** We concluded a significant increase in complication in Group II (classic group) compared with Group I (PTS group), with seroma being the most common. Unsatisfied and good scar quality was also higher in Group II and excellent quality in Group I. Drainage decreased, operation time increased, and hospital stay decreased in Group I compared with Group II. Non-complicated cases had higher BMI and scar quality, while patient satisfaction increased in Group II. **Keywords:** Aesthetic Lipoabdominoplasty; Progressive Tension Suture Techniques; Classic Lipoabdominoplasty.

INTRODUCTION

Although abdominoplasty is regarded as a safe technique, problems can occur with it just as with other surgeries [1]. Abdominoplasty combined with liposuction is called a lipo abdominoplasty, and it's quickly rising in popularity among our patients. Through this surgery, patients can minimize fullness and improve contours around the

abdomen and other places in addition to having their skin tightened [2].

Nowadays, abdominoplasty is a very satisfactory and successful operation, particularly when paired with liposuction and diastasis recti correction. On the other hand, local problems are fairly unusual and can include flap necrosis, hematoma and seroma development, and hypertrophic scars [3].

Seroma development is one of the most common post-abdominoplasty problems. This is regarded as a relatively modest, early, and localized issue. The literature reports a wide range of incidences of seroma following abdominoplasty, with a threshold of 10% being widely accepted. Numerous potential causes, including the disruption of lymphatic and vascular channels, the creation of dead spaces, and the presence of shearing stresses between the flap and fascia, which releases inflammatory mediators [4,5].

There have also been reports of uncommon side effects such systemic inflammatory response syndrome and persistent liquid accumulation with pseudocyst formation. Despite being benign, seromas always make patients feel uncomfortable and anxious, which leads to more frequent doctor visits, treatment procedures, and higher expenses [6].

This study aimed to decrease incidence of complication (hematoma-seroma-infection) of lipoabdominoplasty, evaluate the effect of progressive tension suture technique in lipoabdominoplasty and patient expectation and satisfaction.

METHODS

This Prospective clinical study was carried on 30 patients at Department of Plastic & Reconstruction Surgery, Faculty of Medicine, Zagazig University and lasted for 6 months. patients were equally divided into 2 group and were operated as classic lipoabdominoplasty the other group lipoabdominoplasty using tension closure Suture technique.

Every patient provided written informed consent, and the research was carried according to the Zagazig University Faculty

of Medicine's Research Ethical Committee (International Review Board) (ZU-IRB#11131-19/9-023). The work was completed in compliance with the Declaration of Helsinki, the World Medical Association's code of ethics for human subjects' research.

Inclusion criteria: Patient with redundant skin with excess fat only, both sex, Aged 20–55 years and surgically fit cases.

Exclusion criteria: Patients with chronic diseases (uncontrolled DM, hypertension and bleeding disorders), patients unfit for anesthesia, patient with over expectation.

All patients were subjected to complete history taking: personal background, drug sensitivity in the past, history of previous medical care, previous surgical care, current history, complaint and length of time, both a general and a local physical examination are performed.

Investigational studies: Routine laboratory investigations (Complete blood count (CBC), Liver and kidney functions, PT, PTT and INR, Random blood sugar, HCV-Ab, HBS-Ag, HIV-Ab.

Radiological investigation: Abdominopelvic ultrasound.

Surgical technique

Preoperative assessment: Snapshots Pre- and post-operative marking, as well as marking photography. During a treatment, two surgical marks were produced. In the first, the patient was marked at the midline of the abdomen and the horizontal lower suprapubic line while they were standing. Curved and circular lines were used to indicate the locations for liposuction, and the markings were extended to the lateral lines of the hip. In order to ensure symmetry and an appropriate scar, the second set of markings

was altered while the patient was in a supine posture, using a ruler. The location of the suprapubic scar was approximately 7 cm above the vaginal fork. The Ivo Pitanguy Clinic's preventive regimen was followed during surgery, which included general anesthesia, antimicrobial prophylaxis, and antithrombotic prophylaxis with low molecular weight heparin. They wore compressive stockings.

Aesthetic lipoabdominoplasty

Surgical procedure: During the surgical operation, an infiltration of 0.9% saline solution and epinephrine was performed on the abdomen region. The upper abdomen and flanks were liposuctioned, and then make an incision around the umbilicus with careful undermining to protect umbilicus and remove the flap. With the scarpa fascia intact, the flap was elevated from the lateral sections and extracted in one piece. Cauterization was performed in accordance with standard protocols, which involved supraumbilical detachment and the middle section of the rectus abdominus muscles. To determine the boundaries of the rectus abdominus muscles, a central rectangular section of adipose tissue was excised. By plicating the anterior rectus sheath in a single xifopubic plane with divided and inverted "X" sutures, diastasis was corrected. The umbilical pedunculus was fixed and shortened in proximity to the abdominal aponeurosis. Two sutures were used to close the upper flap, positioned between the middle line of the suprapubic region and the bottom line of the upper edge. Following a periumbilical lipectomy, sutures were used in three planes to seal the upper abdominal flap. The wound was healed and the surgical incision was remade. When

cleared by the anesthesiologist, patients were helped to their ward beds and clad in girdles.

Statistical Analysis:

Microsoft Excel is used to code, enter, and analyze historical data as well as clinical examinations, laboratory tests, and outcome measurements. After that, the data were loaded into the statistical package for the social sciences (SPSS version 20.0) program to be analyzed. The qualitative data was represented as a number and percentage, while the quantitative data was represented as a mean \pm standard deviation. The tests that were employed to determine the significance of the differences were the Chi-square test (X^2) for the qualitative variable and the association test. Logistic regression was used to determine independent predictors and compare differences between quantitative independent groups. For significant results, the P value was set at <0.05 , and for highly significant results, at <0.001 .

RESULTS

There were no statistically significant differences between the studied groups in age or marital status $p>0.05$ (Table 1). There were no statistical significance differences between the studied groups in BMI $p>0.05$ (Table 2). There was a statistically significant increase in operation time among Group I compared with Group II. Also, there was a statistically significant decrease in hospital stay among Group I compared with Group II. $P<0.05$ (Table 3). There was no statistically significant difference in Hb level pre and post-operative between Group I & Group II $P= 0.70$, but there was a statistically significant decrease in drain among Group I compared with Group II $P<0.001$ (Table 4). There was no statistically significant difference in the frequency of blood transfusion postoperative between Group I & Group II (table 5). There was a statistically

significant increase in the frequency of complications among Group II compared with Group I $P < 0.05$. The most frequent complication among Group II was seroma (4 cases) (Table 6). There was no statistically significant difference between complicated cases and non-complicated cases in age or frequency of blood transfusion $P > 0.05$, but there was a statistically significant increase in BMI among noncomplicated cases compared to complicated cases in Group II $P < 0.05$. There was a statistically significant increase in scar quality and patient satisfaction among

non-complicated cases compared to complicated cases in Group II $P = 0.003$ (Table 7). Figure (1) represents surgical markings with the patient standing upright. In A, anterior view, in B, left side, in C, right side. Figures (2, 3): represent 2 patients who underwent lipoabdominoplasty by using the P.T.S technique. Figure (4) represents classic lipoabdominoplasty preoperative and postoperative appearance.

Table 1: Demographic data of the studied groups

Variable		Group I (PTS) (n=15)		Group II (Classic) (n=15)		t	P
Age: (years)		Mean ± Sd	29.87±6.41	32.8±4.20	1.48	0.15	
		Range	21-40	28-40		NS	
Variable		No	%	No	%	χ ²	P
Marital status:		8	53.3	3	20	3.59	0.06
		7	46.7	12	80		NS

SD: Standard deviation t: Independent t test χ²:Chi square test NS: Nonsignificant ($P > 0.05$)

Table 2: BMI among the studied groups

Variable		Group I (PTS) (n=15)		Group II (Classic) (n=15)		t	P
BMI: (Kg/m ²)		Mean ± Sd	35.0±2.4	35.35±3.27	0.33	0.74	
		Range	31-38.5	31-40.1		NS	

BMI: Body mass index SD: Standard deviation t: Independent t-test NS: Nonsignificant ($P > 0.05$)

Table 3: Operation time & hospital stay among the studied groups

Variable		Group I (PTS) (n=15)		Group II (Classic) (n=15)		t	P
Operation time: (h)		Mean ± Sd	4.35±0.48	3.76±0.44	3.54	0.001*	
		Range	3.5-5	3.50-5			
Hospital stay: (day)		Mean ± Sd	3.47±0.52	4.07±0.80	2.44	0.02*	
		Range	3-4	3-5			

SD: Standard deviation t: Independent t-test *: Significant ($P < 0.05$)

Table 4: Hb & drain among the studied groups

Variable		Group I (PTS) (n=15)		Group II (Classic) (n=15)		t/MW	P
		Pre	Post	Pre	Post		
Hb: (gm/dl)	Mean ± Sd	13.26±04.6	11.6±3.5	13.1±0.58	10.2±2.9	0.39	0.70 NS
	Range	3 12.5-14.2	8.9 - 13	12.5-14.3	9.2 - 13		
	Drain: (ml)	Mean ± Sd	84.67±51.22		203.33±39.22		
	Median	75		200			
	Range	30-200		130-250			

SD: Standard deviation **t: Independent t-test** MW: Mann Whitney test NS: Nonsignificant (P>0.05) **: Highly Significant (P<0.001)

Table (5): Blood transfusion among the studied groups:

Variable		Group I (PTS) (n=15)		Group II (Classic) (n=15)		χ^2	P
		No	%	No	%		
Blood transfusion:	No	12	80	13	86.7	0.24	0.62 NS
	Yes	3	20	2	13.3		

χ^2 : Chi square test NS: Nonsignificant (P>0.05)

Table 6: Complications among the studied groups

Variable		Group I (PTS) (n=15)		Group II (Classic) (n=15)		χ^2	P
		No	%	No	%		
Complications:	No	15	100	8	53.3	9.13	0.003*
	Yes	0	0	7	46.7		
Type:	Seroma	----	----	4	26.7	----	----
	Counter deformity	----	----	2	13.3		
	Wound infection	----	----	1	6.7		

χ^2 : Chi square test *: Significant (P<0.05)

Table 7: Relation between complication and patient data, Scar quality and Patient satisfaction in Group II

Variable		Complication				t	P
		No (n=8)		Yes (n=7)			
Age: (years)	Mean ± Sd	34.75±4.74		30.57±1.99		2.16	0.05
	Range	28-40		28-33			
BMI:	Mean ± Sd	37.33±2.52		33.09±2.51		3.26	0.006
	Range	34.7-40.1		31-38			
Variable		No	%	No	%	χ ²	P
Blood transfusion:	No	8	100	5	71.4	2.64	0.10
	Yes	0	0	2	28.6		
Scar quality:	Unsatisfied	0	0	5	71.4	8.57	0.003
	Good	8	100	2	28.6		
Patient satisfaction:	Unsatisfied	0	0	2	28.6	11.43	0.003
	Slightly satisfied	0	0	4	57.1		
	Satisfied	8	100	1	14.3		

SD: Standard deviation t: Independent t test χ²: Chi square test NS: Non significant (P>0.05) *: Significant (P<0.05)

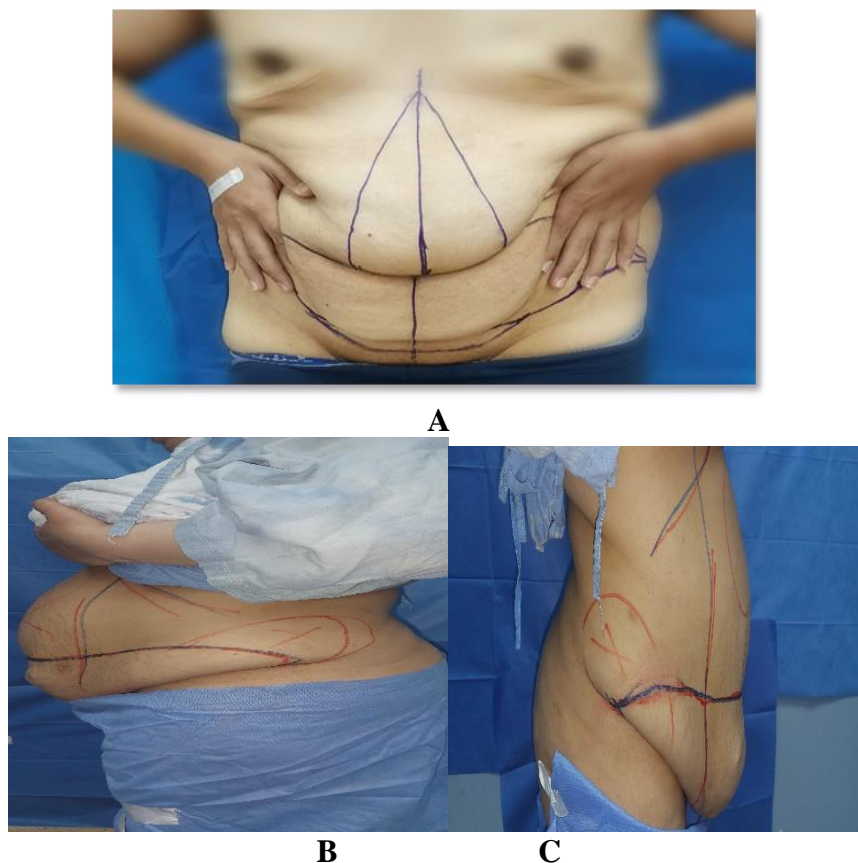


Figure (1): Surgical markings with the patient standing upright. In A, anterior view. In B, left side. In C, right side.



Figure (2): male patient, 32 years who underwent lipoabdominoplasty by using P.T.S technique pre and postoperative.



Figure (3): female patient, 38 years who underwent lipo abdominoplasty by using the P.T.S technique pre and postoperative.



Figure (4): female patient, 42 years who underwent classic lipoabdominoplasty pre and postoperative.

DISCUSSION

Our findings regarding the demographic data of the analyzed groups indicated that there were no statistically significant differences regarding age or marital status between the studied groups. In terms of BMI, there is no statistically significant variations between the groups under investigation. In terms of surgical history, there was no statistically significant difference found between the groups under investigation.

This was in agreement with the study of Gould et al. [7], who aimed to determine whether liposuction increases seroma in PTS and non-PTS abdominoplasty. They reported that 320 patients had drain-based abdominoplasty, and 299 patients had drainless abdominoplasty; age and BMI did not significantly differ between the study groups.

In addition, Bromley et al. [8] sought to ascertain whether 11 PTS is adequate to

prevent seroma in abdominoplasties. They reported that patients were split into three groups for their study: group 1, traditional abdominoplasty without drains and PTS; group 2, PTS and drains in abdominoplasty; and group 3, PTS and drains in abdominoplasty. Age and BMI did not significantly differ between the groups under investigation.

When comparing Group I to Group II, we discovered that there was a statistically significant increase in operation time. Additionally, Group I's hospital stay was statistically much lower than Group II's. In addition to our findings, Andrades et al. [9] found a statistically significant difference in mean surgery time across the groups under study. They also concluded that longer surgeries are caused by progressive tension sutures.

There was a statistically significant difference in the mean hospital stay between the studied

groups, with patients who underwent classic abdominoplasty (group A) having a significantly longer stay. Meanwhile, Cannistrà et al. [10], who sought to describe the technical abdominoplasty procedure in patients who had undergone significant weight loss following bariatric surgery.

Our results showed that while there was a statistically significant decrease in drain among Group I relative to Group II, there was no statistically significant difference in Hb between Group I and Group II pre and post surgery. Between Group I and Group II, there was no statistically significant difference in the frequency of blood transfusions.

According to Andrades et al. [9], there were significantly fewer drain debits in group 4 (with progressive tension sutures) than in group 3 (without progressive tension sutures) during the first postoperative week ($p=0.0001$), after removing the groups in which no drains were used. Additionally, they found that progressive tension lowers drain outputs.

Regarding the complications among the groups under investigation, the current study's findings indicated that Group II experienced a statistically significant higher incidence of difficulties than Group I. Seroma was the most common complication among Group II (4 instances). In terms of patient satisfaction among the groups under study, there was no statistically significant variation seen among the groups. In terms of scar quality, Group II showed a statistically significant higher prevalence of both satisfactory and unsatisfied scar quality as compared to Group I.

Similarly, Khan & U. D. [11] found statistically significant differences in seroma amongst the groups under study.

Additionally, Macias et al. [12] found no statistically significant variation in seroma between the groups under study. Regarding

scar revision, there was no statistically significant difference between the groups under investigation.

In relation to the relationship between patient data and complications in Group II, our results showed that, while there was a statistically significant increase in BMI among non-complicated cases compared to complicated cases in Group II, there was no statistically significant difference in age or frequency of blood transfusion between complicated cases and non-complicated cases. There was a statistically significant increase in patient satisfaction and scar quality in non-difficult cases in Group II as compared to complicated cases in terms of the relationship between complication and scar quality and patient satisfaction.

Our findings are consistent with those of Andrades et al. [9], who found that while age and smoking were not predictive factors for problems, body mass index was ($p = 0.0064$). However, Cannistrà et al. [10] found that patients with a BMI of more than 30 kg/m² had considerably greater rates of seroma.

CONCLUSIONS

We concluded a significant increase in complications in Group II (classic group) compared with Group I (PTS group), with seroma being the most common. Unsatisfied and good scar quality was also higher in Group II and excellent quality in Group I. Drainage decreased, operation time increased, and hospital stay decreased in Group I compared with Group II. Non-complicated cases had higher BMI and scar quality, while patient satisfaction increased in Group II.

Conflict of interest: None

Financial disclosure: None

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