Outcome after preservation of Scarpa's fascia in abdominoplasty

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Background
Postoperative seroma formation remains the most frequent complication following abdominoplasty. The exact pathogenesis of postabdominoplasty seroma remains unclear. Both the process of flap elevation and redundant skin resection disrupt lymphatic drainage in the immediate postoperative period. Preservation of the Scarpa's fascia in abdominoplasty leads to preservation of deep lymphatic vessels.
Patients and methods
Thirty-eight patients underwent abdominoplasty (18 of them with Scarpa's fascia preservation) in the General Surgery Department of Menoufia University Hospital in the period between April 2015 and May 2017. Comparison was done between classic technique and Scarpa's fascia preservation regarding early outcomes and postoperative complications.
Results
With Scarpa's fascia preservation, the mean total drain output (171.5±72.18 ml) was much lesser than classic abdominoplasty (702±136.7 ml); moreover, drains were removed earlier with Scarpa's fascia preservation (P=0.001 and 0.002, respectively). All patients passed without seroma formation in Scarpa's fascia preservation group; however, in the group of classic abdominoplasty, seroma was detected in three (15%) patients. In Scarpa's fascia preservation group, minor wound dehiscence occurred in two (11%) patients and asymmetry in two (11%) other patients, whereas in the other group, two (10%) patients presented with minor wound dehiscence and two (10%) patients developed wound infection.
Conclusion
Preservation of Scarpa fascia during abdominoplasty has a beneficial effect on patient recovery, reducing total drain output, time to drain removal, and hospital stay.

Keywords:
abdominoplasty, classic abdominoplasty, Scarpa's fascia preservation

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Introduction

Abdominoplasty is a very popular body-contouring procedure, especially for women who have lost a considerable amount of weight, or who have had multiple pregnancies. It ranks fifth among the most common surgical cosmetic procedures from the American Society of Plastic Surgeons [1].

Such a major increase in popularity is owing to a recent increase in bariatric surgery, which precedes the popularity of cosmetic surgery, and very good results obtained with this technique, with a positive effect on the patient's self-image and quality of life [2].

Postoperative seroma formation remains the most frequent complication following abdominoplasty. Seroma alone is still reported with frequencies as high as 30 percent [3,4].

The exact pathogenesis of postabdominoplasty seroma remains unclear. Elevation of the skin flap necessarily results in a large elevated surface area that produces serous fluid secondary to the inflammatory stimulus of injury. Both the process of flap elevation and redundant skin resection also disrupt lymphatic vessels, resulting in a compromised state of lymphatic drainage in the immediate postoperative period [5].

Preservation of the Scarpa's fascia in abdominoplasty is not new. Its benefits are as follows: less bleeding owing to preservation of the inferior perforating vessels, good adherence between the flap and the deep layers, and less seroma formation owing to preservation of deep lymphatic vessels [6].

Patients and methods

This study was conducted on patients who presented to the outpatient clinic of the General Surgery

Department and Plastic and Reconstructive Surgery Unit of Menoufia University Hospital with anterior abdominal wall laxity of different causes. The study was performed in the period between April 2015 and May 2017.

Inclusion criteria

Patients presented with anterior abdominal wall deformities including excess abdominal skin and/or adipose tissue with or without muscle laxity.

Exclusion criteria

Patients with pregnancy within the previous year, increased intra-abdominal pressure owing to ascites or organomegally, morbid obesity with BMI more than 40 and with previous liposuction or other abdominal surgeries rather than cesarean sections were excluded.

Patients included in the study were divided into two groups: A (18 patients) and B (20 patients).

Patients in group A were subjected to Scarpa's fascia preservation during abdominoplasty and patients in group B were subjected to the classic abdominoplasty.

All patients were subjected to the following:

(1) Preoperative workup, explanation and an informed consent before admission (informed about the location of the incision and placement of drains), full history taking, general examination, local examination, and investigations.
(2) Operative workup:
    (a) Preoperative marking and photographing was done in standing position with relaxed skin tension.
    (b) Anesthesia and patient positioning: the procedure was performed under general anesthesia. The patient was positioned on the operating room table in supine position, with upper body raised 30°.
    (c) Operative technique.

Following the individually marked incision line, a sharp incision was done as far as the Scarpa's fascia in group A and rectus fascia in group B. After identification of the abdominal fascia, the flap was dissected cranially along the selected fascia. In group A, the abdominal flap was dissected in two different planes: presuperficial fascia (pre-Scarpa's fascia) in infraumbilical region and preaponeurotic (premuscular) in the supraumbilical region. In group B, the abdominal flap was classically dissected in the preaponeurotic plane.

A circular incision was done around the umbilicus. The dermo-fat flap was then mobilized away from the umbilicus while ensuring that the umbilical stalk would be sufficiently thick and that a wide base would be created during the dissection to prevent later perfusion disorders of the umbilicus.

Plication of the fascia longitudinally was routinely carried out with continuous nonabsorbable thread.

In group A, a small central strip of Scarpa's fascia (few centimeters from the midline) was removed with the underlying deep fat to expose the muscular fascia plane to simplify fascial placation (Fig. 1). The entire dermo-fat flap was then pulled down under traction with the upper body flexed 30° to define the boundaries for later resection. The umbilicus was then positioned outwardly and fitted into the correct new position in the external cutaneous incision without tension.

An 18-Fr suction drain was placed through a separate stab incision. The wound was then closed in three planes. The wound was then covered by placing a simple sterile dressing over the scar. Compressive garment was then used.

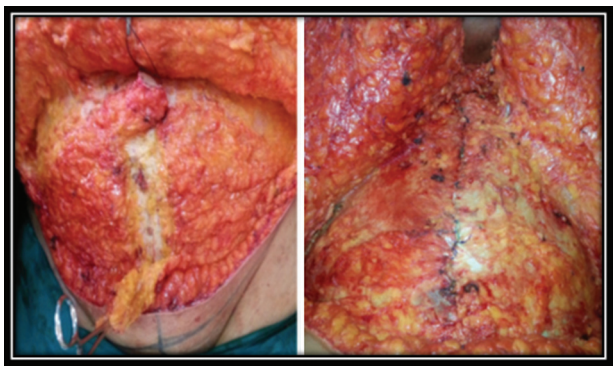
Postoperative follow-up

Patients were subjected to early postoperative follow-up and late follow-up after 1 and 3 months via serial scheduled follow-up visits at outpatient clinic.

Parenteral antibiotic therapy was prescribed during hospitalization period that was replaced with oral tablets as out-patient treatment, as well as anti-inflammatory agents and analgesic agents.

The drains were evacuated daily and removed once the output was less than 30 ml/24 h. The first dressing was

Figure 1



Strip of Scarpa's fascia was removed (left side) with the underlying deep fat to expose the muscular fascia plane to simplify fascial placation (right side).

scheduled on the fifth postoperative day, with the objective of verifying the surgical incision, local hygiene, and presence of hematomas, dehiscence, or seromas.

After 15 days, abdominal ultrasound was prescribed to evaluate presence of seroma. Compression garments were used for at least 6 weeks after surgery. Patients were instructed to avoid strenuous activity for 8 weeks postoperatively.

Results

The results included comparison between the two groups in their preoperative data, intraoperative steps, and postoperative follow-up.

Group A included 16 (89%) women and two (11%) men, whereas group B included 20 (100%) women. Mean age of groups A and B was 35.2±9.07 and 35.5±9.57 years, respectively, and there was no significant difference statistically between the two studied groups.

The mean±SD BMI of group A patients was 33.81 ±4.3, ranging from 23.66 minimally to 37.46 maximally. However, mean±SD BMI of group B patients was 34.47±5.47, ranging from 24.68 to 40.

There was no statistically significant difference in both groups regarding operative time and total resection weight. The average operative time in hours in group A was 2:27 h ranging from 2:00 to 3:00 h, whereas that of group B patients was 2:09 h, ranging from 1:30 to 3:00 h. The average total resection weight in group A was 2390 g, ranging from 800 to 3500 g, whereas that of group B was 3220 g, ranging from 1500 to 4500 g, with statistically significant difference between the groups (P=0.002) (Table 1).

In group A, the mean total drain output was 171.5± 72.18 ml, which was much lesser than group B, where it was 702±136.7 ml. Moreover, drains in group A were removed earlier on the third day (range: 2–4 days), whereas in group B were removed on the sixth day (range: 3–12 days). There is a significant statistical difference between the two studied groups regarding the total drain output and time of drain removal (P=0.001 and 0.002, respectively) (Table 2).

Seroma formation was evaluated postoperatively either clinically or via abdominal ultrasound. In group A, all patients passed without seroma formation. However, in group B, seroma was detected in three (15%) patients. Other complications were recorded in eight (21%) patients among the 38 patients included in this study. In group A, minor wound dehiscence occurred in two (11%) patients and asymmetry in two (11%) other patients. In group B, two (10%) patients presented postoperatively with minor wound dehiscence, two (10%) patients developed wound infection, whereas three (15%) patients developed seroma formation.

Discussion

Postoperative seroma formation remains the most frequent complication following an abdominoplasty procedure. A number of investigators have reviewed

Table 1 Comparison between both groups regarding patients' characteristics and operative parameters

Patient characteristics	Group A (mean±SD)	Group B (mean±SD)	*t*-Test	*P*-value
Age (years)	35.20±9.07	35.50±9.57		0.944
BMI	33.81±4.28	34.47±+5.47	0.092	0.765
Operative time (min)	147±22	129±25	2.945	0.103
Resection weight (g)	2390±834.5	3220±1123.2	3.518	0.002*

*Statistically significant.

Table 2 Comparison between both groups regarding drain output, its removal and seroma formation

	Group A	Group B	*t*-Test	*P*-value
Total drain output (ml)				
Range	70–260	180–1600	14.649	0.001*
Mean±SD	171.5±72.18	702±136.7		
Drain removal (days)				
Range	2–4	3–12	13.750	0.002*
Mean±SD	2.90±0.73	6±2.53		
Seroma formation				
Yes	0	3 (15)	1.546 (χ^2)	0.102
No	100	17 (85)		

*Statistically significant.

the frequency of postoperative seromas over the past 30 years, reporting incidences between 5 and 50% [7].

Multiple surgical strategies have been described to lower the incidence of seroma formation, such as internal fixation techniques, and avoidance of electrocautery, progressive tension sutures, use of pressure dressings, and use of fibrin glue. Seroma alone is still reported with frequencies as high as 30% [1].

In the unresected abdomen, the supraumbilical flap drains its lymphatic superiorly in the axilla and the infraumbilical flap drains into the inguinal region. After flap resection, the only remaining tissue is the supraumbilical flap, which still drains in the axilla. At this point, the lymphatic vessels of the subscarpal fat are disconnected from the tissues they originally drained, the infraumbilical resected flap, and thus are not likely to contribute to the drainage of the resected tissues. It is possible that these potentially intact subscarpal lymphatic would simply pick up any free fluid produced in the wound, thus reducing the risk of seroma [8].

According to our results, there is mild decrease of the mean operative time in classic abdominoplasty (group B) compared with suprascarpal plane of dissection (group A), as technically it is the easiest plane to find and to be dissected. Moreover, patients of classic abdominoplasty have significantly higher mean duration till drain removal of ~6 days as compared with suprascarpal group of ~3 days.

Costa-Ferreira *et al.* [1] performed 208 abdominoplasty, including 65 patients who underwent abdominoplasty with preservation of Scarpa's fascia in infraumbilical region. There was no statistically significant difference between groups with respect to BMI, previous abdominal operations, or comorbid medical conditions. The group with preservation of the Scarpa fascia had an average reduction of the total amount of drain output of more than 50%. This group also had an average reduction of 2.0 days until the time to drain removal and average of 1.9 days of the hospital stay.

In our work, we found group B with preservation of scarpus fascia had reduction of total amount in drain of ~50% and reduction of time of drain removal of ~2 days.

Fang *et al.* [9] have reviewed consecutive abdominoplasties with 99 procedures performed using a standard suprafascial dissection (group I) and 103 procedures using a modified plane of flap elevation that preserves the thin areolar tissue along the abdominal wall (group II). Patient characteristics did not differ significantly, with the mean age and BMI being almost similar. Perioperative complications included seven seromas in group I and two seromas in group II. The drains for patients in group II met the criteria for removal 3 days earlier than those for group I. On average, patients in group II had drains removed at postoperative days 4–5.

Koller and Hintringer [10] performed a study that enrolled 50 patients who underwent a full abdominoplasty with umbilicus transposition. The patients were alternated to the Scarpa group or the rectus group. In the rectus group, the average drain output collected until removal was 157 ml in the rectus group and 93 ml in the Scarpa group. Drains were removed between postoperative days 2 and 5. Symptomatic seroma formation took place in four patients in the rectus group, with no reported case of seroma in the Scarpa group.

In our work, we found that patients with low BMI are better candidate for the preservation of Scarpa's fascia during abdominoplasty. Scarpa fascia preservation on the infraumbilical area better respects the physiology of the abdominal wall, as it also implies the preservation of the deep fatty layer along with its connective tissue, lymphatic vessels, arteries, and veins [11].

Preservation of the Scarpa fascia in the infraumbilical region leads to apposition of fat to fat when the flap is approximated in position and that this decreases seroma**;** rapid reconstruction of the lymphatic vessels results in rapid reconstruction of the lymphatic drainage than in traditional abdominoplasty where the superficial lymphatic vessels are cut completely. Moreover, it can be conjectured that a fat-to-fat interface leads to less shear movement and/or more 'stickiness' between the opposing surfaces [3].

Conclusion

Preservation of Scarpa fascia during abdominoplasty has a beneficial effect on patient recovery, reducing total drain output, time to drain removal and hospital stay.

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Nil.

Conflicts of interest

There are no conflicts of interest.

References

1 Cossta-Ferreira A, Rebelo M, Vásconez LO. Scarpa fascia preservation during abdominoplasty: a prospective study. Plast Reconstr Surg 2010; 125:1233–1239.

2 Papadopulos NA, Staffler V, Mirceva V, Henrich G, Papadopoulos ON, Kovacs L, *et al.* Does abdominoplasty have a positive influence on quality of life, self-esteem, and emotional stability? Plast Reconstr Surg 2012; 129: 957–962.

3 Aly AS. Prospective outcome study of 360 patients treated with liposuction, lipoabdominoplasty, and abdominoplasty. Plast Reconstr Surg 2012; 129: 979–980.

4 Shermak M. Seroma development following body contouring surgery for massive weight loss: patient risk factors and treatment strategies. Plast Reconstr Surg 2008; 122:280.

5 Avelar JM. Abdominoplasty: a new technique without undermining and fat layer removal. J Arq Catarinense 2000; 291:147–149.

6 Arco A. More superficial abdominoplasty in post-bariatric surgery patients. Plast Reconstr Surg 2010; 126:1411.

7 Khan UD. Risk of seroma with simultaneous liposuction and abdominoplasty and the role of progressive tension suture. Aesthetic Plast Surg 2008; 32:93–99.

8 Al Aly A. Discussion Scarpa fascia preservation during abdominoplasty. J Plast Reconstr Surg 2010; 125:1240–1241.

9 Fang RC, Lin SJ, Mustoe TA. Abdominoplasty flap elevation in a more superficial plane: decreasing the need for drains. J Plast Reconstr Surg 2010; 125:677–682.

10 Koller M, Hintringer T. Circumferential superficial fascia lift of the lower trunk: surgical technique and retrospective review of 50 cases. J Plast Reconstr Aesthet Surg 2010 65:433–437.

11 Kumar P, Pandey A, Kumar B, *et al.* Anatomical study of superficial fascia and localized fat deposits of abdomen. Indian J Plast Surg 2011; 44: 478–483.