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Original Article

Comparative Study to Assess the Outcome of the Abdominohernioplasty Versus the Sole Hernioplasty

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ABSTRACT

Background: Abdominoplasty was increasingly performed in daily surgical practice. It is usually associated with hernia. Different surgeons prefer to carry out hernioplasty with abdominoplasty. However, this was challenged by longer operative time and theoretical increase of associated complications.

Objective of the Study: The present study aimed to assess the surgical outcome of the hernioplasty alone versus combined abdominohernioplasty.

Patients and Methods: This study was conducted between September 2019 and September 2020. Forty patients with ventral hernias were included and divided randomly into two equal groups; First group for combined hernioplasty with abdominoplasty and the other group for hernioplasty alone. All patients were evaluated preoperatively by full history, physical examination and preoperative routine Lab investigations to assure fitness for surgery. Postoperatively, patients were observed overnight in hospital. Pain was controlled and ambulation was permitted as early as possible after surgery. To ensure patient comfort and abdominal support, a compressive binder was used. Patients were clinically reevaluated 7 days and at one, three and six months after surgery.

Results: Groups A and B were comparable regarding patient age, gender, body mass index, and hernia type. The operative time and intraoperative bleeding were significantly higher in abdominoplasty group compared to hernioplasty group [154.01±13.73 minutes, 417.5±106.72 CC vs 64.75±9.11 and 92.5±32.55 respectively]. Early and late postoperative complications showed non-significant difference, except significant increase of recurrence among hernioplasty than abdominoplasty group [25.0% vs 0.0% respectively]. Abdominoplasty was associated with significant increase of total drain output, longer duration of drain and early mobility. Finally, there was significant increase of satisfaction with body size, body shape, relief of lower back pain, easy sex practice satisfaction and scar satisfaction in abdominoplasty group.

Conclusion: Abdominoplasty with hernioplasty is a safe approach for ventral hernia repair, with superior aesthetic outcome and patient satisfaction than hernioplasty alone.

Keywords: Ventral hernia; Abdominoplasty; Hernioplasty; Paraumbilical; Aesthesia

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* Main subject and any subcategories have been classified according to the research topic.

INTRODUCTION

A hernia is defined as a protrusion or sliding of an abdominal organ through a weak or disrupted fibromuscular tissues of the abdominal wall [1].

Ventral hernia was assigned for non-inguinal, non-hiatal herniation through the fascia of the abdominal wall. Repair of hernia is a common surgical procedure. Surgery is typically indicated for subjects fit for surgery, who had symptoms related to hernia or those prone to higher risk of developing complications due to hernia. Ventral hernias could also affect patient's quality of life, need hospitalization and even lead to death in some circumstances [2].

The most common anatomical sites for hernia are the umbilical and groin areas. Other areas are less frequently involved. Congenital, traumatic and postoperative [incisional] hernia should be repaired as soon as possible [3].

The repair of ventral hernia is most commonly performed during daily surgical practice all over the world. About twenty million or more of prosthetic meshes are inserted every year [4].

Hernial repair aimed to reconstruct the integrity of abdominal wall structures and at the same time minimize morbidity. Techniques in use are the primary closure, the staged repair and insertion of prosthetic materials. If abdominoplasty was indicated, it could be achieved by the use of lower abdominal, transverse incision and resection of redundant skin. Use abdominoplasty procedures with hernioplasty seems to increase the safety of the procedures and improve results [5].

The etiology of abdominal wall defects could be due to incisional hernia, trauma, tumor resection and infection. Incisional hernia is the most common. Nearly, all types of hernia were closed by general surgeons. However, recurrent hernias with wider defects are challenging and plastic surgeon is usually consulted for help. Traumatic wounds are the most difficult to treat due to frequent contamination [6].

Otherwise, the umbilical and paraumbilical hernias are the most common spontaneous hernias in adult patients [10.0% of all primary hernias] and 90.0% are

acquired. Multiparity, obesity, ascites, constipation, prostatic hyperplasia and chronic obstructive pulmonary disease are the common causes of increased intra-abdominal pressure with potential to herniation [7].

The ventral hernia usually accompanies the patient for years before surgical management, due to its asymptomatic nature. Pain, discomfort and increased size are the probable symptoms urge the patient to seek medical advice. Incarceration could be the initial complaint at time of presentation [8,9]. The surgical options for hernial repair are variable [8].

In mesh hernia repair, the location of mesh represents an important factor. It may be an Onlay [mesh placed anteriorly to the fascia] or it may also be a sublay [deep to fascial edges, either preperitoneal or intraperitoneal] [10].

Combining ventral hernial repair with abdominoplasty can possibly lead to vascular compromise of the umbilical stalk. In some circumstances, plication of the rectus diastasis may be enough to ameliorate the appearance of the hernia. Supporting the plication with a component separation maneuver may reduce the hernia recurrence rate [11].

Patients underwent hernia repair operation combined with abdominoplasty reported a satisfaction with the postoperative aesthetics of their umbilicus along with their abdominoplasty. However, combining hernia repair with abdominoplasty can probably lead to many complications, like vascular compromise, increased risk of venous thromboembolism and increasing post-operative pain [12].

AIM OF THE WORK

This study is a comparative prospective study aimed to document the surgical outcome of the combined abdominoplasty with hernioplasty versus hernioplasty alone regarding the early and late postoperative complications and patient satisfaction.

PATIENTS AND METHODS

This study was completed between September 2019 and September 2020. It was carried out in General Surgery department [Damietta Faculty of

Medicine, Al-Azhar University].

Forty patients with ventral hernias were included and divided randomly into two equal groups; First group [group A] included patients underwent combined hernioplasty with abdominoplasty and the other group [group B] with patients underwent hernioplasty alone. Randomization had been achieved by assigning numbers to each technique in enclosed envelope, that open just before operation by a nurse not included in the study. Ethically, if the surgeon and patient decide another procedure than the assigned one in the envelope, for the benefit of the patient, the assigned procedure was ignored and patient was excluded from the study.

Patients are instructed about their right to refuse joining to the research or withdraw at any time without affecting their chances to receive the optimal treatment at any time. In addition, all data related to treatment were elucidated [e.g., significant risks, outcome, complications, relevant treatment options, and the risks of not having the procedure]. Then, all patients signed an informed consent and all procedures were performed in accordance with good clinical practice guidelines. The protocol was approved by the research and ethics committee [Damietta Faculty of Medicine, Al-Azhar university] [IRP approval number: IRB 00012367- 20-09-007].

All patients were assessed by full history, physical examination and preoperative routine Lab investigations to assure fitness for surgery. Also, risk factors such as smoking, diabetes, obesity, were addressed prior to surgery, in order to optimize outcomes after hernia repair. Smokers were instructed to stop for at least three months before surgery. Patients with other conditions were treated and stabilized before surgery. An antibiotic prophylaxis in the form of a single dose of the third-generation cephalosporin was administered within 60 minutes before skin incision.

Abdominohernioplasty [group A] [13].

General anesthesia was most often used with endotracheal intubation. Preoperative markings were crucial to successful surgery and to get desired symmetrical results. The patient was marked in the

recumbent and standing positions, noting the midline and planned incisions. A transverse line was made just above the pubic hair, approximately 7 cm from the vulvar commissure. Extending laterally from each direction towards the anterior superior iliac spine. The patient is usually in supine position, with the arms extended 90° when possible and secured on arm boards. A pillow was placed under the knees. Preparation and disinfection of the operative field was done with a wide skin preparation and draping. Each patient was prepared from xiphoid to the mid-thighs, and as far laterally as possible. A transverse skin incision, following the previously determined markings, is done in the lowest skin crease above the pubic hairline and dissection was continued through superficial fascia to the Scrupa's fascia. A circular incision surrounding the umbilicus and extending down to the rectus sheath to create an umbilical stalk which is completely freed from the surrounding adipocutaneous tissue in a manner to preserve its blood supply [Figure 1].

After exposure of the hernia sac, dissection was carried all around targeting to separate the sac of the hernia from the overlying adipo-cutaneous tissue till reaching the edges of the defect of the sac. The sac is dissected and de-attached completely from its adjacent structures till completely separated from edges of the defect and then contents of the sac are reduced. The flap was elevated at the level of the deep fascia and dissection was carried out both sharply and with electrocautery. Flap dissection is continued up to the xyphoid and medial costal margins avoiding lateral undermining to preserve the intercostal perforators to the flap. Careful hemostasis was performed with diathermy. In most cases, we used a triangular dissection that was wider inferiorly and narrowest at the level of the xyphoid. When dissection was complete and after complete removal of the sac, the defect is repaired by either non-absorbable 0 or 1 polypropylene or long-acting absorbable sutures like PDS loop. We usually used the running sutures to close the defect. Then, we recreated the linea alba by midline plicating sutures with long-acting absorbable sutures like PDS loop in a running continuous manner with a locking stitch every 3-4 sutures reinforced by a stay suture using vicryl 0 or 1 stitch. We start as much far as the epigastrium and following in a manner of area increasing in width as descending to the pubis and

sparing the stalk of the umbilicus, plicating the weak anterior abdominal wall. Plication is done above and below the umbilicus symmetrically on both sides of the midline. After achieving good hemostasis, we used polypropylene mesh by on lay technique over the plicated anterior abdominal wall and the mesh is fixed the abdominal wall with 3/0 polypropylene sutures till it is completely secured. Then, the patient was brought to a flexed position of approximately 45° to 60° at the hips, with the knees bent slightly and the bed was placed in the Trendelenburg position so that the torso was parallel to the floor. The flap was pulled down and the amount of excess tissue was determined, marked and then the redundant skin and fat were excised. Another way to create the umbilicus when it is involved in the hernia defect is to remove the umbilicus and create a new one. A 2-cm circle of the overlying flap was defatted, and a circular or vertically oriented oval of skin was excised. From the underside of the flap, 3-0 Vicryl was placed in a 3-point suture formation from the abdominal skin dermis to the umbilical stalk dermis to the muscle fascia at 12, 3, 6 and 9 o'clock around the stalk. Tying the sutures created a neoumbilical depression and splinted the umbilical incision from contracture. The umbilical skin edges were approximated with a few interrupted 5-0 polypropylene. One or two negative pressure closed drainage is placed. We placed midline sutures to secure the flap in place in the midline of the suprapubic. Lateral sutures were placed more sparsely, and care was taken to place them symmetrically, from side to side. The wound was closed [tension free] in two layers, vicryl 3-0 or 2-0 stitches were applied to fix the scarp's fascia of the superior abdominal flap to the inferior scarp fascia border. The skin was closed with 4-0 Vicryl deep dermal sutures and a running 3-0 polypropylene subcuticular suture [Figures 2-5].



Figure [2]: Hernial sac of umbilical hernia



Figure [3]: Typical degree of flap elevation. Rectus diastasis has been repaired, and lateral areas show preserved septi from liposuction performed in the deep plane of the flap



Figure [4]: Abdominoplasty: placement of mesh



Figure [1]: Dissection of the umbilicus from the flap.



Figure [5]: Preoperative and postoperative picture of abdominoplasty case

Hernioplasty [group B] ^[14]

General anesthesia was most often used, but in certain situations, regional or local anesthesia can be applied depending on the site and size of the hernia. The incision was planned and marked either in transverse or longitudinal or oblique directions; according to the defect and site of hernia.

The patient was usually in supine position. The skin is prepared and disinfected according to the site of hernia. The skin incised and dissecting of the underlying subcutaneous was using the coagulation property of the diathermy in order to control the bleeding. Identification and dissection of the hernia sac from the overlying subcutaneous by creation of skin flaps on both sides of the incision. The sac was dissected all around till reaching and identifying the edges of neck of the sac. The sac is incised usually at its neck and not at the fundus for fear of presence of adhesions between walls of the sac and its contents. After reduction of the contents of the sac whether bowel loops or omentum, the sac is freed from the sheath at its neck. Then, the defect is repaired by a strong polypropylene 1 or 0 suture by a starting stitch beyond the defect and continued all the length of the defect with 1 cm apart from the edges and 1 cm in between the stitches.

After completion of the repair of the defect, good hemostasis is assured. Polypropylene Mesh with size 15x15 cm is placed by Onlay technique over repaired anterior abdominal wall muscles and fixed by interrupted or continuous stitches polypropylene 3/0 or 4/0 stitches. A closed system drain under negative suction is placed to assure no postoperative collection over the mesh for fear of infection. The subcutaneous tissue is approximated by interrupted absorbable stitches. The skin is closed by subcuticular stitch for better cosmeses of the wound.

Postoperative care:

Patients were observed overnight in hospital. Pain was well controlled. Patients were ambulated as early as possible after surgery. A compressive binder was used on all patients for comfort and abdominal support. For the group-A patients with combined abdominohernioplasty: patients were encouraged to

walk as upright as tolerable. While ambulating or recumbent, patients were not required to maintain a hip flexed position.

Postoperative Follow-up:

Patients were discharged when their autonomy was recovered, pain was under control, and the surgical team was satisfied with the absence of obvious immediate complications. Patients were clinically reevaluated 7 days and 1, 3, and 6 months after surgery. Drains over the mesh and in the subcutaneous plane were removed after two weeks. Suction drains were removed when the output is less than 50 ml of serous fluid per day for group-B patients who underwent hernioplasty alone and for the group-A patients with combined abdominohernioplasty usually after two weeks again when the discharged fluid is serous and less than 50 ml per day. Patients were encouraged to increase activities as tolerated but were advised to avoid strenuous exercise, abdominal exercise, and lifting of greater than 5 kilograms for the first 6 weeks postoperatively. After discharge, patients were followed up at the surgical outpatient clinic closely for their wounds and assessment of their general and aesthetic condition. Then, they are followed up with a thorough physical examination, every three months.

Statistical Analysis:

All data were collected, tabulated and statistically analyzed using SPSS 22.0 for windows [SPSS Inc., Chicago, IL, USA]. Data were tested for normal distribution using the Shapiro Walk test. Qualitative data were represented as frequencies and relative percentages. Chi square test [χ^2] and Fisher exact was used to calculate difference between qualitative variables as indicated. Quantitative data were expressed as mean \pm SD [Standard deviation] for parametric and median and range for non-parametric data. Independent T test and Mann Whitney test were used to calculate difference between quantitative variables in two groups for parametric and non-parametric variables respectively. All statistical comparisons were two tailed with significance Level of P-value \leq 0.05 indicates significant, $p < 0.001$ indicates highly significant difference while, $P > 0.05$ indicates non-significant difference

RESULTS

In the current study age ranged between 28 and 50 years and there was no significant difference between groups A and B [40.25±7.07 vs. 43.05±6.81 respectively]. Also, no significant difference was found regarding patient gender or body mass index [BMI]. The hernia was epigastric, incisional and paraumbilical [≤ 3 cm around umbilicus] in 25.0%, 10.0% and 65.0% of group A, and 10.0%, 20.0% and 70.0% of group B, respectively; with no significant difference between groups [Table 1].

Results of the current study revealed a significant difference between the studied groups regarding operative time and intraoperative bleeding. The operative time and intraoperative bleeding were significantly higher in abdominoplasty group compared to hernioplasty group [154.01±13.73 minutes, 417.5±106.72 cc vs 64.75±9.11 minutes and 92.5±32.55 cc, respectively] [table 2]. The early postoperative complications were comparable in the two groups without statistical significance difference.

No patients reported skin or umbilical necrosis. Regarding late postoperative complication, recurrence of hernia was significantly higher among hernioplasty than abdominoplasty group [25.0% vs 0.0% respectively], while hypertrophic scar was higher among abdominoplasty than hernioplasty [20.0% vs. 5.0% respectively]. However, the difference did not reach statistical significance [Table 3].

Results of the current study revealed a significant difference between the two studied groups regarding to total drain output, drain duration and day of starting mobility. In abdominoplasty group the total drain output was sufficiently higher, the drain duration was significantly longer, the day of starting mobility was significantly early [Table 4].

The current study results showed significant increase of satisfaction with body size, body shape, relief of lower back pain, easy sex practice satisfaction and scar satisfaction in abdominoplasty than hernioplasty [Table 5].

Table [1]: Demographic characteristics and type of hernia among studied groups

Variables		Abdominohernioplasty [n=20]	Hernioplasty [n=20]	t / χ^2	P
Age [years]; Mean± SD		40.25 ± 7.07	43.05 ± 6.81	1.28	0.210
Sex	Male	4 [20%]	8 [40%]	1.91	0.168
	Female	16 [80%]	12 [60%]		
BMI [kg/m ²]; Mean± SD		33.25 ± 3.94	34.63 ± 3.75	1.13	0.264
Type of hernia	Epigastric	5 [25%]	2 [10%]	1.99	0.371
	Incisional	2 [10%]	4 [20%]		
	Paraumbilical	13 [65%]	14 [70%]		

Table [2]: Operative data & hospital stay among studied groups

Variables	Abdominohernioplasty [n=20]	Hernioplasty [n=20]	t / χ^2	P
Operative time [min]	154.01 ± 13.73	64.75 ± 9.11	24.2	<0.001*
Intraoperative bleeding [CC]	417.5 ± 106.72	92.5 ± 32.55	13	<0.001*
Intraoperative blood transfusion	2 [10%]	0	2.11	0.147
Hospital stay [days]	1.25 ± 0.551	1.1 ± 0.308	1.06	0.294

Table [3]: Early Complications between the two studied groups

		Abdominohernioplasty [n=20]		Hernioplasty [n=20]		χ^2	P
		N	%	N	%		
Early postoperative complications	Wound dehiscence	3	15	3	15	--	1.0
	Wound infection	4	20.0	2	10.0	0.784	0.376
	Wheezy chest	0	0.0	2	10.0	2.11	0.147
	Seroma	6	30.0	4	20.0	0.533	0.465
	Hematoma	2	10.0	0	0.0	2.11	0.147
Late postoperative complications	Hypertrophic scar	4	20	1	5	2.06	0.151
	Recurrent hernia	0	0.0	5	25	5.71	0.017*

Table [4]: Follow up characteristics between the two studied group

Variables	Abdominoplasty[n=20]	Hernioplasty [n=20]	t / χ^2	P
Postoperative fever	6 [30%]	5 [25%]	0.125	0.723
Temperature	37.47 ± 0.513	37.50 ± 0.688	0.135	0.893
Total drain output [ml]	1487 ± 358.35	218.75 ± 102.88	15.2	<0.001*
Drain duration [days]	11.45 ± 2.11	5.1 ± 1.48	11.0	<0.001*
Day of starting mobility	1 st day	5 [25%]	8.15	0.017*
	2 nd day	13 [65%]		
	3 rd day	2 [10%]		

Table [5]: Body image satisfaction among the studied groups

Satisfaction with	Abdominohernioplasty [n=20]	Hernioplasty [n=20]	χ^2	P
Body size	20 [100%]	4 [20.0%]	26.7	<0.001*
Body shape	20 [100%]	5 [25.0%]	24.0	<0.001*
Lower back pain	16 [80%]	0 [0.0%]	26.7	<0.001*
Easy Sex practice satisfaction	20 [100%]	0 [0.0%]	40.0	<0.001*
Scar satisfaction	18 [90%]	12 [60%]	4.81	0.028*

DISCUSSION

The current work aimed to assess the short-term outcome of the combined abdominoplasty and hernioplasty versus hernioplasty alone. It included two groups [20 patient in each group]. Both groups were comparable regarding patient age, sex and BMI.

This was not the same situation in the study of Wagdi *et al.* [15] where their patients were significantly younger in hernioplasty alone than combined hernioabdominoplasty [39.45 vs 45.15 years respectively] with statistically significant difference [P-value 0.017]. Their results reflected the need of abdominoplasty in older than younger patients. It could be due to increased weakness of the anterior abdominal wall muscles with advanced age.

This explanation was confirmed by Cheesborough and Dumanian [16] who reported that, ventral hernias are a common encounter in patients scheduled for abdominoplasty. Those patients seek abdominal countering surgery after repeated pregnancies, which lead to laxity and deformity of the anterior abdominal wall; the deformity which is difficult to be reversed by dieting and/or muscular exercise.

The same authors reported non-significant difference between groups regarding BMI, indicating that, BMI did not affect the choice of the operative intervention. In addition, Madabhushi *et al.* [17] reported comparable results as the current study regarding patient age and gender; although they performed

intervention in an older group [the mean age was around 53.0 years in both groups]. But both groups were statistically comparable.

The type of hernia was comparable between both groups. The paraumbilical type represented 67.5% of all types. Sakr *et al.* [18] reported significant increase of paraumbilical hernia in abdominoplasty than mesh-abdominoplasty [80% versus 55.3%, respectively, p =0.0193], but had less incisional hernias [5.0% versus 18.3%, respectively]. However, the overall percentage of paraumbilical hernia is consistent with the current study [67.65%].

On the contrary, Zemlyak *et al.* [19] reported a 92.4% of incisional hernias type. However, both groups [abdominoplasty versus hernioplasty] were comparable regarding type o the hernia, as in the current study.

Previous studies yielded contradictory data regarding the risk-benefit of concurrent pannicul-ectomy [VHR-PAN] with hernia repair. Some authors reported improved overall patient satisfaction, and reduced tension on the hernia repair [20]. However, the combination of two major procedures needs a longer operative time and greater wound healing demands, placing patients at increased risk for venous thromboembolism [VTE] and wound complications [21].

The current study showed a significant increase of the operative time and the intraoperative bleeding in abdominoplasty than hernioplasty. In addition, these

results were reported in Wagdi *et al.* [15] study. They reported a mean time of 86 minutes [range 50-120 minutes] in hernioplasty, compared to 187 [range 150-250 minutes] in abdominoplasty group. Thus, the procedure type had a major effect on the length of the operation and the implied risks implied. Additionally, blood loss was higher among combined group [470 vs 205 ml]. However, bleeding was controlled by the usual hemostatic measures and passes without any significant complications [as in the current study].

In addition, Fischer *et al.* [20] demonstrated that abdomino-hernioplasty procedures had longer operative times than hernioplasty [$P < 0.0001$].

Total duration of postoperative hospital study was longer in abdominoplasty than hernioplasty group [1.25 ± 0.55 vs 1.1 ± 0.308 days]. The difference did not reach statistical significance. Shubinets *et al.* [22] reported a significantly longer duration of adjusted hospital stay [6.8% vs 5.2 days, $p < 0.001$]. These results are different than in the current study in two domains [the duration and statistical situation]. This could be explained by the higher number of their patients in each arm of their study [1013 in abdominoplasty and 18328 in hernioplasty].

Recurrence rate was significantly higher among hernioplasty than combined group. Otherwise no significant difference was yielded regarding other early or late postoperative complications. The reported complications were wound dehiscence and infection, wheezy chest, seroma, hematoma, hypertrophic scar and recurrence.

This distribution is comparable to Ielpo *et al.* [23] who reported that, the most post-incisional hernia repair complications were seroma, hematoma, abscess formation and abdominal wall pseudocyst.

Reid and Dumanian [24] demonstrated a reduction in the incidence of wound infection.

The current results agree with Zemlyak *et al.* [19] who included 143 patients in the panniculectomy/ventral hernia repair and 42 participants in the panniculectomy group. The rates for complications between the two groups were not statistically significant. However, after controlling for age, gender, BMI, and other factors, the panniculectomy/ventral

hernia repair group was more likely to develop wound cellulitis. The authors also questioned the reduction of recurrence rate after combined intervention.

Fischer *et al.* [25] conducted a large retrospective database analysis to assess the additional risks between both interventions. They reported that, individuals who underwent the combined procedure were at significantly higher risk for wound complications [$p < 0.001$], venous thromboembolism [$p = 0.044$], reoperation [$p < 0.001$] and overall medical morbidity [$p < 0.001$]. Two notable limitations of this study include that used dataset only includes 30-day outcomes, precluding analysis of long-term differences in the two study groups. Secondly, the dataset did not include details on the type of panniculectomy skin resection or wound closure techniques; therefore, propensity matching and exploratory analysis of these potentially confounding variables was not possible.

Results of the current work furthermore supported by Ijlin *et al.* [13] regarding early and late postoperative complications.

Le Gall *et al.* [26] indicated a trend towards more infectious complications in the combined group [20% versus 3.3%]. However, the difference is not statistically significant [$P = 0.100$], and all infectious complications were abscesses. No mesh or extended infection with signs of sepsis were found.

Sosin *et al.* [27] demonstrated that there were 917 patients who underwent an SVHRP [Simultaneous ventral hernia repair and panniculectomy]. The most common complications were superficial surgical-site infection [15.8%] and seroma formation [11.2%]. Systemic complications were less common [7.8%], with a thromboembolic event rate of 1.2% percent. The overall mortality rate was 0.4 percent. No systemic complications were reported in the current study.

In abdominoplasty group [in the current work], the total drain output was significantly higher, the drain duration was significantly longer, the day of starting mobility was significantly early.

Wagdi *et al.* [15] reported that the drain output was ranged from 100 – 400 cc with a mean of 225 cc in group-A [hernioplasty] in comparison to a range of 900 – 2100 cc with a mean of 1655 cc in group B

[abdominoplasty]. They encouraged patients to move as soon as possible, with significant increase of early ambulation in abdominoplasty group, as in the current study. They also reported significant increase of all domains of body satisfaction, as in the current one. Cooper *et al.* [28] demonstrated that an abdominoplasty in the setting of an incisional hernia repair can improve patient's satisfaction, particularly appearance, hygiene, and self-confidence.

Saariniemi *et al.* [29] concluded that abdominoplasty significantly improved quality of life, body satisfaction, effectiveness, sexual practice, self-esteem, and mental health for patients with incisional hernias. These results are consistent with the current one.

The current study limitation is the small sample size of included subjects, which prevent globalization of the study results. However, the study strengths include its prospective design and randomization of study subjects. In addition, it is an early study comparing hernioplasty to hernioplasty with abdominoplasty in our institution. It adds to overall known literature. However, future large-scale studies are warranted.

Conclusion: Abdominoplasty can be performed in combination with hernia repair. Simultaneous technique can be safely performed with the comparable morbidity, but with lower recurrence rate and significant improvement of the quality of life.

Financial and Non-financial Relationships and Activities of Interest

None

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