Simultaneous ventral hernia repair and abdominoplasty in multiparous Yemeni women: a retrospective study

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Objective
This study aimed to assess the outcomes of ventral hernia repair simultaneous with abdominoplasty in multiparous women.
Patients and methods
This retrospective study was performed on 55 multiparous women with ventral hernia who underwent ventral hernia repair simultaneous with abdominoplasty during the period from March 2018 through February 2020. Repair of ventral hernias was achieved with or without the use of prosthetic mesh, where the use of the mesh was restricted for patients with defects larger than 3 cm in length and those with incisional hernia. All demographic data were collected, and the patients' follow-up visits were reviewed from the charts for postoperative complications, recurrence, and patient's satisfaction for 1 year.
Results
The mean BMI was 30.1±5.0 kg/m^2. A total of 38 (69.1%) patients had umbilical and paraumbilical hernias, whereas 17 (30.9%) patients had incisional hernias. The mean size of the hernia defect was 3.9±1.7 cm. Overall, 28 (50.9%) patients required repair with a mesh. The overall complication rate was 43.6% (wound dehiscence, 18.2%; seroma, 16.4%; and wound infection, 14.5%). There was a significant correlation only between wound dehiscence and obesity (P=0.024). A total of 52 (94.5%) patients were satisfied, whereas three (5.5%) patients were not satisfied regarding symptoms relief and esthetic results. There was no recorded hernia recurrence at 1-year follow-up.
Conclusion
The combination of hernia repair and abdominoplasty is a safe and practical procedure. This combination has the benefits of repairing the hernia, improving abdominal contour, and relieving the patient's symptoms.

Keywords:
abdominoplasty, complications, multiparous, recurrence, satisfaction, ventral hernia

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Introduction

Ventral hernias are usually associated with abdominal wall laxity and redundancy in many patients. The laxity and deformity of the abdominal wall develop from repeated pregnancies, which stretch the musculoaponeurotic structures of the abdominal wall due to excessive increase in the intra-abdominal pressure by the progressively enlarging uterus. Moreover, the effects of hormonal changes during pregnancy and straining at the time of delivery can further contribute to abdominal wall weakness [1]. In this situation, a combined repair of the abdominal wall defects and tightening the musculoaponeurotic laxity is needed. Therefore, ventral hernia repair concomitant with abdominoplasty has been described to improve the contour deformity of the whole musculofascial layer [2]. In addition, this combined procedure has many benefits for patients including removal of excessive skin (for better local hygiene and reduction of skin infection), improving muscular tone by strengthening the musculoaponeurotic layer, stabilization of the lumbar spine level, minimizing chronic lower back pain, and improving the quality of life with less anxiety and better personal relationships [3].

In the past, surgeons did not prefer to perform ventral hernia repair concomitant with abdominoplasty, which might increase operative time, delay wound healing, and cause a possible compromise on the vascularity of the abdominal skin and subcutaneous fat, which might subsequently worsen the outcomes [4].

Literature has reported debatable results regarding hernio-abdominoplasty procedure. Although some studies showed lower frequency of complications, others reported high complication rates [5,6].

Therefore, our study aimed to assess the outcomes of simultaneous repair of ventral hernia and abdominoplasty in multiparous women.

Patients and methods

A retrospective review of the records of 55 multiparous women (three births or more) with ventral hernia from March 2018 through February 2020 was done. These patients complained mainly of abdominal wall deformity and back pain. The demographic data including age, BMI, number of births, smoking, diabetes mellitus, complaint, type of the hernia, and size of the hernia defect were collected. All these patients underwent ventral hernia repair with or without the use of polyprolene mesh together with abdominoplasty. The mesh was used for patients with defects larger than 3 cm in length and for all patients with incisional hernia. The follow-up visits were reviewed for the records of postoperative complications, recurrence, and patient's satisfaction for 1-year follow-up period. Our study was approved by the local ethical committee (Decision no: 1069, date 21/8/2021).

All the operations were performed by the same surgeon, and the following steps were followed:

Preoperative workup

A third-generation cephalosporin was given intravenously for all patients at the time of induction of anesthesia. Prophylactic anticoagulation therapy was given for obese patients. Preoperative markings for the midline and the part to be excised at the level of umbilicus or above were done while the patient was standing.

Operative technique

Under general anesthesia, an incision between the two anterior superior iliac spines at the natural suprapubic crease was initially used. Then, a circular incision around the umbilicus and extended deeply preserving the umbilical stalk with its blood supply was performed. In patients with umbilical hernia, the umbilicus was excised and followed by creation of a new umbilicus at a later step.

Dissection and elevation of the skin and subcutaneous tissue, superficial to the muscle fascia, was started from below upward to the xiphoid cartilage. The hernia defect was identified and repaired by direct closure. Fascial plication was performed in two layers: the first one in the form of an interrupted figure-of-eight buried sutures of number zero or number one polypropylene (Prolene), which was started from the level of the xiphoid to the umbilical stalk, then continued from the umbilical stalk downward to the pubis, and the second layer of fascial plication was sutured in continuous manner. In the cases where repair with a mesh was indicated, a polypropylene mesh was spread over fascial plication according to the size of the defect or weakness of musculoaponeurotic layer and fixed to the external oblique fascia using interrupted sutures of 2/0 polypropylene. The excess skin and subcutaneous tissues were excised. Afterward, externalization of the umbilicus through a small oval incision in the dissected flap midway between the two iliac crests was made. Two large sized suction drains were inserted, and the wound was closed using interrupted sutures of number zero polyglactin 910 (Vicryl) for the subcutaneous tissues and a continuous suture of 3/0 subcuticular poliglecaprone 25 (Monocryle) for the skin.

Postoperative workup

All patients were advised for early ambulation within the first three postoperative days. All were instructed to wear an abdominal binder and to avoid any strenuous physical activity for 6 months. Antibiotics were administered postoperatively for 5 days, and drains were removed when the amount of the discharge was less than or equal to 30 ml.

Statistical analysis

The data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) software version 26 and presented using tables and graphs (IBM, Chicago, Illinois; USA). Data were summarized using frequency and percentage for qualitative variables and mean, SD, and range for quantitative variables. χ^2 test, χ^2 test with Yate correction, and Fisher tests were used to identify the significance of association between the quantitative variables. P value of less than 0.05 was considered statistically significant.

Consent statement

This research was performed at Department of General Surgery, Plastic & Reconstructive Surgery Unit, Department of General Surgery, Faculty of Medicine & Health Sciences, Sana'a University, Department of General surgery, Kuwait University Hospital, Sana'a, Yemen. Ethical Committee approval and written, informed consent were obtained from all participants.

Results

A total of 55 patients were included in this study. All patients were females. The general characteristics of

Table 1 Patients' data (*N*=55 patients)

Variables	Mean±SD	Range		*n* (%)
Age (years)	40.0±9.6	24.0, 65.0	21–30	10 (18.2)
			31–40	26 (47.3)
			41–50	12 (21.8)
			51–60	6 (10.9)
			61–70	1 (1.8)
Number of births	4.2±1.3	3.0, 8.0	1–3	18 (32.7)
			4–6	34 (61.8)
			> 6	3 (5.5)
BMI (kg/m^2)	30.1±5.0	20.2, 41.2	Normal	12 (21.8)
			Overweight	14 (25.5)
			Mild obesity	19 (34.5)
			Moderate obesity	9 (16.4)
			Severe obesity	1 (1.8)
Smoking			Yes	10 (18.2)
			No	45 (81.8)
DM			Yes	3 (5.5)
			No	52 (94.5)
Type of hernia			Umbilical	12 (21.8)
			Paraumbilical	26 (47.2)
			Incisional lower midline	11 (20)
			Incisional CS	3 (5.5)
			Incisional upper midline	3 (5.5)
Defect size (cm)	3.9±1.7	1.5, 8.0		
Pendulous abdomen			Yes	55 (100)
			No	0
Symptoms			Abdominal deformity	55 (100)
			Back pain	20 (36.4)
			Maceration	24 (43.6)
			Knee pain	13 (23.6)
			Unfit clothes	26 (47.3)
			Under self-esteem	27 (49.1)
Abdominal wall			Weak	48 (87.3)
			Good	7 (12.7)
Mesh use			Yes	28 (50.9)
			No	27 (49.1)
Umbilicus			Preserved	38 (69.1)
			Excised	17 (30.9)
Duration of drain removal (days)	5.4±2.0	3.0, 10.0	3–5	33 (60)
			≥6	11 (40)

CS, cesarean section; DM, diabetes mellitus.

the patients are presented in Table 1. The mean age was 40±9.6 years, and the mean BMI was 30.1±5.0 kg/m^2. Overall, 29 (52.7%) patients were obese (BMI ≥30 kg/m^2). The majority of patients (81.8%) were nonsmokers. Three (5.4%) patients had history of diabetes mellitus, which was controlled. All of the women in this study were multiparous (3–8 births), with the mean number of births being 4.2±1.3. All patients had pendulous abdomens and complained of abdominal deformities, in addition to ventral hernia. Other complaints included back pain (36.4%), maceration under the redundant skin (43.6%), knee pain (23.6%), unfit clothes (47.3%), and under self-esteem (49.1%).

A total of 26 (47.2%) patients presented with paraumbilical, 12 (21.8%) with umbilical, and 17 (31.0%) with incisional hernia. The mean size of the hernia defect was 3.9±1.7 cm (range, 1.5–8 cm) in length.

Overall, 28 (50.9%) patients required hernia repair with a synthetic mesh material when the defect size was more than 3 cm in length and for all incisional hernias. The umbilicus was preserved in 38 (69.0%) patients, whereas it was excised in 17 (31.0%) patients in whom the vascularity was compromised. The mean duration for drainage was 5.4±2.0 days.

The overall complication rate was 43.6%, wound dehiscence occurred in 10 (18.2%) patients who were treated conservatively, and seroma formation in nine (16.4%) patients. In four patients with seroma, the seromas were drained at the outpatient office, whereas in the remaining five, their seromas were absorbed spontaneously. Wound infection occurred in eight (14.5%) patients and dog ear deformity in one (1.8%) patient and was corrected under local anesthesia. No cases of umbilical necrosis were recorded in patients with a preserved umbilicus (Table 2).

The correlation between obesity and wound dehiscence was statistically significant (P=0.024), whereas the correlation between obesity or the use of mesh for repair and the complications including seroma formation and wound infection had no statistical significance (Table 3).

A total of 52 (94.5%) patients were satisfied and three (5.5%) patients were dissatisfied regarding symptom relief and esthetic results (Figs 1 and 2a. b, Fig. 33a. b).

There was no hernia recurrence recorded at 1-year follow-up.

Table 2 Postoperative complications (*N*=55 patients)

Complications	Yes [*n* (%)]	No [*n* (%)]
Wound dehiscence	10 (18.2)	45 (81.8)
Umbilical necrosis	0	55 (100.0)
Seroma	9 (16.4)	46 (83.6)
Wound infection	8 (14.5)	47 (85.5)
Dog ear	1 (1.8)	54 (98.2)
Overall complication rate	24 (43.6)	31 (56.4)

Discussion

Patients with abdominal wall laxity and deformity in addition to ventral hernias usually need combined surgical treatment of both problems at the same time. Repair of ventral hernias alone usually results in lower patient satisfaction. On the contrary, patients with combined ventral hernia repair and abdominoplasty usually have improved quality of life and self-image [1,7].

Abdominoplasty is one of the most common esthetic procedures used to correct skin redundancy and fascial laxity of the abdomen, which are usually found in multiparous women. The advantages of the abdominoplasty approach are full exposure of the abdominal wall defect and a fascial repair away from the skin incision. By applying these aspects into hernia repair, the procedure is safe, with low recurrence rates and good esthetic outcomes [8].

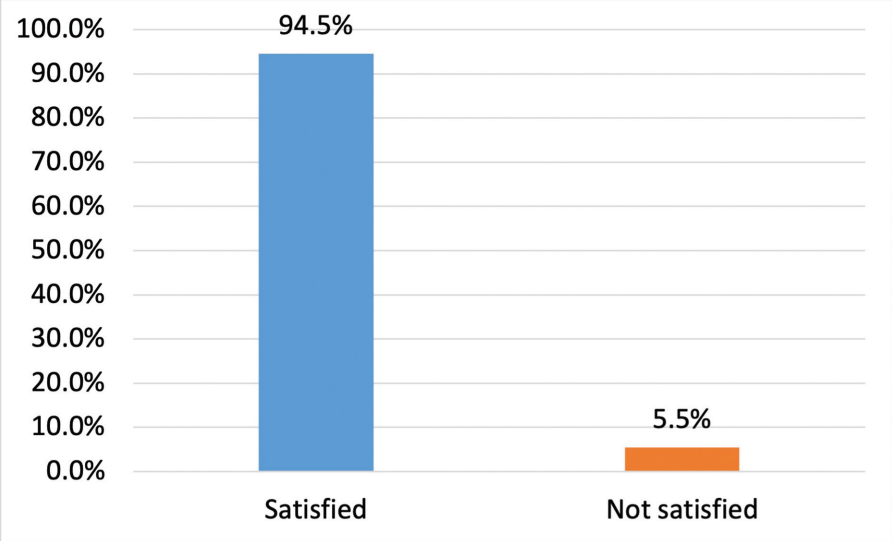
Although repair of ventral hernias with a mesh has the potential of lower recurrence than suture repair alone, a prosthetic mesh insertion is usually avoided by many surgeons owing to its inherent increased risk of occurrence of surgical-site infection, which would not end with good esthetic results.

In our study a polypropylene mesh was used in 28 (50.9%) patients when the hernia defect was more than 3 cm in length and in those with incisional hernia regardless of the defect size, this in addition to the two layers' plication of recti at the linea alba as part of abdominoplasty procedure. This was done to avoid hernia recurrences. In 27 (49.1%) patients, we found

Table 3 Correlation between complications and obesity or mesh repair

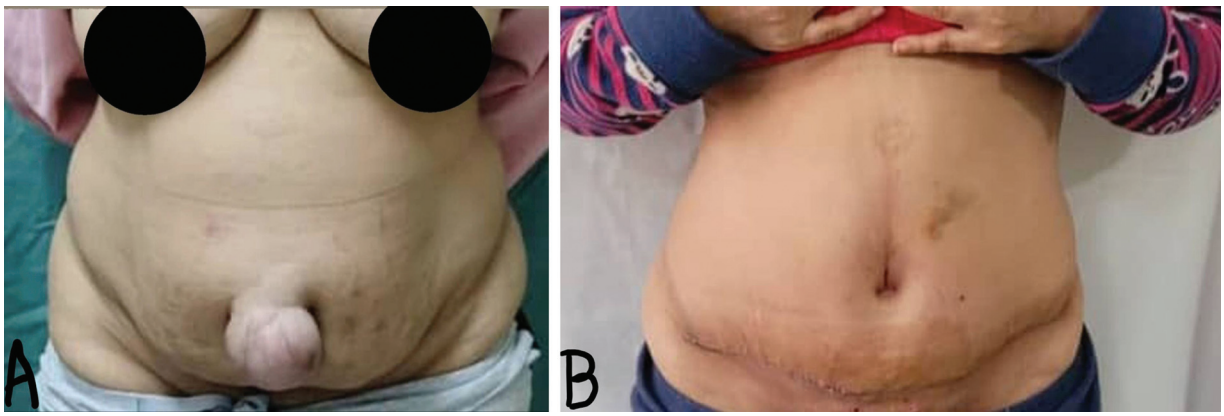
	Obesity			Mesh use		
Complication	Yes [*n* (%)]	No [*n* (%)]	*P* value	Yes [*n* (%)]	No [*n* (%)]	*P* value
Dehiscence			0.024			0.324
Yes	9 (31.0)	1 (3.8)		7 (25.0)	3 (11.1)	
No	20 (69.0)	25 (96.2)		21 (75.0)	24 (88.9)	
Umbilical necrosis			NA			NA
Yes	0	0		0	0	
No	29 (100.0)	26 (100.0)		28 (100.0)	27 (100.0)	
Seroma			0.200			0.952
Yes	7 (24.1)	2 (7.7)		4 (14.3)	5 (18.5)	
No	22 (75.9)	24 (92.3)		24 (85.7)	22 (81.5)	
Infection			1.000			0.275
Yes	4 (13.8)	4 (15.4)		6 (21.4)	2 (7.4)	
No	25 (86.2)	22 (84.6)		22 (78.6)	25 (92.6)	
			1.000			0.985
Dog ear						
Yes	1 (3.4)	0		0	1 (3.7)	
No	28 (96.6)	26 (100.0)		28 (100.0)	26 (96.3)	

Figure 1



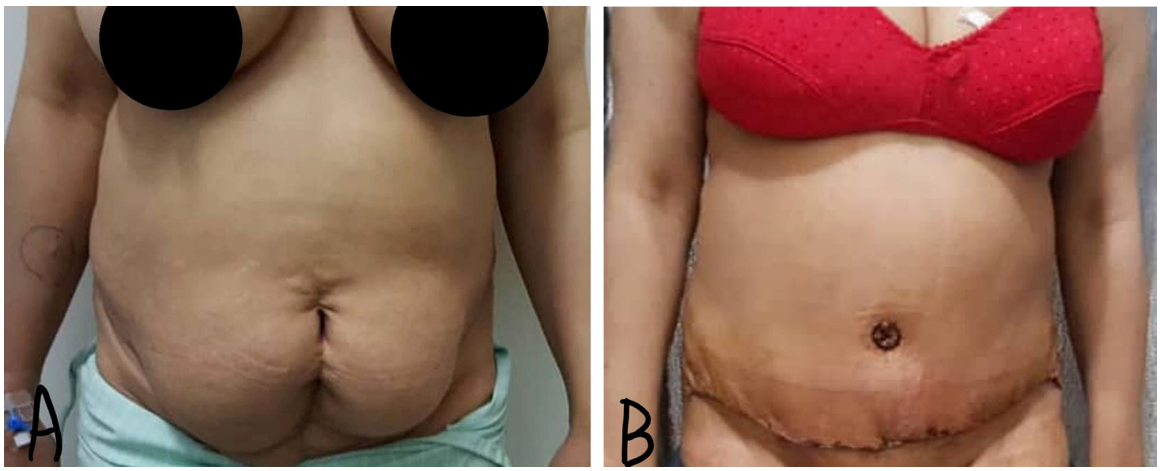
Patient satisfaction.

Figure 2



(a) Preoperative view of a patient who had umbilical hernia. (b) Postoperative view, 2 weeks after umbilical hernia repair with abdominoplasty.

Figure 3



(a) Preoperative view of a patient who had incisional hernia. (b) Postoperative view 2 months after hernia repair with abdominoplasty.

that suture repair of the defect along with plication of recti was enough to strengthen the musculoaponeurotic layer, with no recorded risk of hernia recurrences at 1-year follow-up. Zemlyak *et al.* [9] in their study of 185 patients reported the safety of combining abdominoplasty and ventral hernia repair with a mesh, with no statistically significant differences between combined abdominoplasty with ventral hernia mesh repair and abdominoplasty alone. Moreover, Saker and colleagues in their study proved that the use of a polypropylene mesh in abdominoplasty is suitable for multiparous women with severe fascial laxity, with or without a ventral hernia, because it led to maintaining the body contour with lower recurrence rate and fewer revision procedures than abdominoplasty alone. They also noticed that the use of a polypropylene mesh did not increase the occurrence of a seroma, which was 4.44% in their study [10]. These results coincide with our results, where four out of nine patients who developed seroma collection postoperatively had a mesh repair. In contrast, Kim and Stevenson [11] published that in classical abdominoplasty, seroma may develop in up to 30% of the patients. Moreover, Ghnnam [5] published that the most common complication of mesh hernia repair with abdominoplasty was seroma formation (20.8%).

The overall complication rate in the present study was 43.6%, including nine (16.4%) patients with seroma collection, in whom four were aspirated at our outpatient clinic and five were left to be absorbed spontaneously. Partial wound dehiscence mainly at the middle of the incision occurred in 10 (18.2%) patients and were left to heal without intervention. Wound infection and dog ear deformity were reported in 14.5 and 1.8% of patients, respectively. The wound infections were superficial infection and were treated conservatively. Dog ear deformity was corrected under local anesthesia. In 2019, Diaconu and colleagues reported in their study in obese patients that patients with simultaneous ventral hernia repair and panniculectomy group had more surgical-site occurrences (surgical-site infection, wound dehiscence, skin necrosis, nonhealing incisional wound, seroma, and hematoma) versus patients in the ventral hernia repair only group (57 vs. 40%, respectively; P=0.0012), but no differences between the two groups regarding surgical-site occurrences that required an intervention [12]. Similarly, another comparative study between simultaneous ventral hernia repair with panniculectomy and ventral hernia repair only showed a higher surgical-site occurrence rate in the simultaneous ventral hernia repair with panniculectomy group (46.5 vs. 27.9%), with surgical-site infection rate of 11.6 versus 9.3% and hernia recurrence rate of 16.3 versus 20.9% [13]. However, Koolen and colleagues performed a study in 2014 on 4925 patients, where they observed a significantly higher overall complication rate in those with abdominoplasty combined with hernia repair group compared with the abdominoplasty only group (18.3 vs. 9.8%; P<0.001) [6]. Moreover, Eltantawy and colleagues reported an overall complication rate of 32% in patients with ventral hernia and abdominal wall laxity who underwent on-lay mesh hernio-abdominoplasty, and these complications were in the form of seroma formation, surgical-site infection of skin and subcutaneous tissue, and partial wound dehiscence [14]. On the contrary, Qureshi and Janjua [15] found in their study of combined hernia repair and abdominoplasty that only 6% of their patients (mean BMI 21.7 kg/m^2) had wound infection as well as seroma formation. This low rate of complications may be owing to the fact that the study was performed on nonobese patients. In comparison, several studies showed that the rate of complications and recurrences after laparoscopic hernia repair was 2–26% and 0–17, respectively [16–20].

Our observation was that simultaneous ventral hernia repair and abdominoplasty in multiparous women had a high rate of complications (43.6%), which is concordant with the results from prior studies [6,12–14]. Although these high complication rates 'especially wound complications' were treated without intervention, one of the most important problems after ventral hernia repair 'especially mesh repair' is wound infection. Correlation between complications and obesity or mesh repair is displayed in Table 3, which shows a higher wound infection rate when a mesh was used (although not statistically significant, probably because of the small sample size). Moreover, our study showed no significant correlation between seroma formation and mesh repair or obesity. In contrast, wound dehiscence developed in nine obese patients as opposed to one nonobese patient (P=0.024). This is probably because of excision of all skin and subcutaneous tissue below the umbilicus and pulling the upper flap for suturing down at the site of previous incision (lower flap) during abdominoplasty, which may compromise the blood supply of the flap. Most of our patients were obese (52.7%), which added the possibility of wound dehiscence. In contrast, Adelmo *et al.* [21] demonstrated that obese patients had the largest number of complications (9/14) followed by diabetic patients (2/5) among those patients with

comorbidities, and they concluded that mainly obesity and also diabetes contributed to the development of complications.

Dissection of the umbilical hernia sac at the umbilical stalk base can damage the umbilical perforating vessels, leading to umbilical necrosis [22]. Therefore, in this study, we excised the umbilicus in all patients with umbilical hernia and in patients in whom hernia repair was anticipated to compromise the blood supply of the umbilical stalk. As a result, there was no recorded umbilical necrosis in our study. In contrast, Person *et al.* [23] in their study stated that there was no umbilical necrosis in both open and laparoscopic approaches to combined abdominoplasty and umbilical hernia repair in spite that the umbilicus was preserved.

Most of obese multiparous women have a large pannus hanging over the pubic area and thighs. They got more benefit, when this redundant pannus was removed regarding good hygiene, improving mobility and lifestyle. So, the benefit of abdominoplasty is to improve patient's symptoms and satisfaction. Previous studies proved that abdominoplasty together with hernia repair improved the quality of life, body satisfaction, sexual function, self-esteem, and mental health [24,25]. Similar improvements were achieved in our study where the rate of satisfaction regarding symptom improvement and esthetic outcome was 94.5%. Wagdi *et al.* [3] in their study noticed that patient satisfaction was only 45% in incisional hernia repair group as compared with 100% patient satisfaction in the simultaneous hernioplasty with abdominoplasty group.

Hernia recurrence can occur early or late following hernia repair. The recurrence may be related to technical factors, aging, hernia biology, or other patient-related factors [26]. Venclauskas *et al.* [27] found that the recurrence rate was higher in keel technique group (22.2%) when compared with the mesh technique group in incisional hernia repair at 1-year follow-up. On the contrary, Robertson *et al.* [8] reported a recurrence rate of 9.7% in abdominoplasty repair for abdominal hernia. However, there was no recorded recurrence of hernia in our study at 1-year follow-up. This is can be explained either by strengthening of musculoaponeurotic layer of abdominal wall through plication of recti after hernia repair during surgery and/or due to short time of follow-up.

The main limitation of the present study was that it was a retrospective, single-center study with relatively small number of patients and short time of follow-up. Further studies including larger number and high-risk patients for long-term follow-up are needed to reproduce the outcome of this study.

Conclusion

The combination of ventral hernia repair with abdominoplasty is a safe and practical procedure. This combination has the benefits of repairing the hernia, improving abdominal contour, and relieving the patient's symptoms in multiparous women with appropriate patient selection process particularly that with certain comorbidities. These are in addition to excellent patient satisfaction.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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