

# Abdominoplasty With Dermal-Fat Graft: Simultaneous Repair of Hernia and Diastasis – A Retrospective Case-Series

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## Abstract

### Background:

Abdominoplasty, a widely sought-after cosmetic surgery, addresses esthetic concerns and the integrity of the abdominal structure. This investigation explored the use of autologous dermal fat grafts in eight patients undergoing abdominoplasty to concurrently address multiple abdominal wall pathologies, such as hernias and rectus diastasis. The primary aim of this study was to assess the viability and safety of this innovative technique for harmonizing functional and esthetic outcomes.

### Methods:

This study encompassed a retrospective case series conducted by a single surgeon. The surgical procedure included abdominoplasty using dermal fat grafts created from surplus tissue excised during surgery: detailed operative techniques and postoperative care aligned with established abdominoplasty procedures. The assessment employed a unique evaluation framework with seven components to analyze outcomes, encompassing patient and surgeon satisfaction, hernia status, and esthetic enhancements.

### Results:

The outcomes demonstrated the technical feasibility and safety of using autologous dermal fat grafts during abdominoplasty. All eight patients underwent the procedure successfully without complications associated with synthetic mesh repair. The technique effectively resolved functional concerns and aligned with the esthetic objectives of abdominoplasty, leading to high patient satisfaction.

### Conclusions:

While displaying promise, this study acknowledges limitations such as its retrospective nature and small sample size. It emphasizes the necessity for further prospective, controlled studies involving larger cohorts to validate this innovative approach's long-term effectiveness in addressing functional and esthetic abdominal concerns. Successful integration of dermal fat grafting during abdominoplasty presents potential benefits for patients seeking comprehensive abdominal wall reconstruction.

**Keywords:** Abdominoplasty, Hernia, Eventration, Dermal fat graft

## Introduction

Abdominoplasty, a sought-after procedure for body contouring primarily targeting esthetic considerations related to aging or post-weight loss functional restoration, has witnessed a notable surge in popularity, ranking as the fourth most performed surgical procedure globally in 2018, totaling 888,712 procedures [1-4].

The primary aim of abdominoplasty is to enhance the appearance and structural integrity of various abdominal layers, encompassing the skin, subcutaneous tissues, and musculofascial components. Multiple techniques have been developed to effectively achieve these objectives.

Another key aim of abdominoplasty is to address abdominal wall pathologies, including rectus muscle diastasis, which often leads to abdominal eventration. Standardly rectified through anterior fascial plication, cases of rectus muscle atrophy may necessitate reinforcement with prosthetic materials. Abdominal wall issues may also include ventral or incisional hernias and defects in the abdominal wall structure. While some surgeons advocate for separate hernia repair from abdominoplasty, others propose concurrent procedures. Significant hernia defects akin to large rectus diastasis may require

prosthetic material reinforcement, posing challenges, particularly in esthetic surgery, due to potential complications [5,6].

Biological materials are viable for addressing abdominal wall pathologies, although uncertainty persists regarding their long-term efficacy.

An essential principle in abdominoplasty involves addressing varying levels of surplus skin and subcutaneous tissue beneath the umbilicus, which necessitates excision. Rather than relying on prosthetic or biological materials, this surplus tissue can be repurposed as an autologous dermal fat graft, marking an innovative approach in plastic surgery for managing abdominal wall pathologies such as eventration and defects [7-10].

This case series investigates eight patients who presented with a pioneering technique for fortifying the abdominal wall during abdominoplasty: using surplus tissue for autologous dermal fat grafting.

## Patients And Methods:

### Surgical Procedure

All patients exhibited Matarasso classifications [11] of 3 and 4, presenting with eventration or hernia and meeting the definitive

criteria for abdominoplasty. The operative technique closely follows the principles of a standard abdominoplasty, with a unique initial step involving de-epithelialization of the disposable region below the umbilicus along pre-defined patterns. Subsequently, the area containing excess skin and subcutaneous fat was dissected and excised. The disposable tissue was refined into meticulously prepared dermal fat grafts, approximately 0.8 mm thick, ensuring the preservation of the dermal layer and a fine layer of adipose tissue (Figure.1,2).

Continuing with superficial dissection above the umbilicus, extending toward the xiphoid region, and laterally, particular attention was given to patients with herniation. In such instances, meticulous dissection was performed to release the hernia sac and its contents, gently restoring them to their original position while exposing the underlying defect.

Rectus fascia plication above and below the umbilicus was performed in all cases, and custom-shaped dermal fat grafts were applied to the anterior rectus fascia for enhanced reinforcement. Subsequent steps closely mirrored those of a typical abdominoplasty, and postoperative care aligned with standard abdominoplasty protocols (Figure. 3,4).



Figure 1: Depithelialization of Skin under the umbilicus.





**Figure 2:** Custom-shaped plates that contain a dermal layer and a fine layer of adipose tissue.



**Figure 3:** Under umbilicus eventration which was repaired with rectus fascia plication.





**Figure 4:** Reinforcement of abdominal wall after rectus fascia plication by a Custom-shaped dermal fat graft.

**Data collection and analysis**

This study was approved by the Ethical Committee of Isfahan University of Medical Sciences (IR.MUI.MED.REC.1402.448). Comprehensive data were gathered for each patient in this retrospective case series. Informed consent was obtained from all patients included. To evaluate the surgical procedure’s impact on patient outcomes, scores from a novel evaluation framework

consisting of seven components (Panniculus, Striae, Bulking, Eventration, Patient Satisfaction, Surgeon Evaluation, and Blind Evaluation) were meticulously analyzed. Each element was rated on a scale from 0 to 3, with 0 representing the lowest score and 3 indicating the highest score (**Table 1**).

**Table 1.** Abdominal Aesthetic Score.

Panniculus	0	No Panniculus
	1	Slight Panniculus
	2	Moderate Panniculus
	3	Enormous Panniculus
Striae	0	No Striae
	1	Above Umbilicus
	2	Above and Below Umbilicus
	3	Above and Below Umbilicus and Flanks
Bulking	0	Slight Bulking
	1	Moderate Bulking
	2	Enormous Bulking
	3	Slight Bulking
Eventration	0	Slight Eventration
	1	Moderate Eventration
	2	Enormous Eventration

	3	Slight Eventration
Patient Satisfaction	0	lack of Satisfaction
	1	Low Satisfaction
	2	Moderate Satisfaction
	3	Full Satisfaction
Surgeon Evaluation	0	lack of Satisfaction
	1	Low Satisfaction
	2	Moderate Satisfaction
	3	Full Satisfaction
Blind Evaluation	0	lack of Satisfaction
	1	Low Satisfaction
	2	Moderate Satisfaction
	3	Full Satisfaction

**Statistical Limitations and Case Profiles:**

Considering the limited statistical power of the study and the non-normal distribution within the population, formal statistical analysis using the statistical variables was not feasible. Therefore, the raw data collected are presented in their original form.

**Case Profiles:**

**Case 1:** A 39-year-old female, previously treated for lymphoma and a ruptured spleen necessitating emergency laparotomy, developed a large grade V incisional hernia. During abdominoplasty, a custom

10x15 cm dermal fat graft reinforced the identified abdominal wall defect based on esthetic criteria after rectus fascia plication.

**Case 2:** A 41-year-old male had previously undergone ventral hernia repair using a non-absorbable mesh. In a subsequent procedure, the mesh was extracted, and the defect was repaired, plicated, and reinforced with a custom 5x10 cm dermal fat graft.

**Case 3:** A 38-year-old woman with a history of laparotomy developed an incisional hernia, which was repaired, plicated, and reinforced with a custom 10x10 cm dermal fat graft. **(Figure.5,6)**



**Figure 5:** Pre-operative Photography of the Patient.



**Figure 6:** Post-operative Photography of the Patient.

**Case 4:** A 48-year-old woman who underwent multiple cesarean sections presented with excess abdominal wall skin and an incisional hernia repaired, plicated, and reinforced using a custom 10x10 cm dermal fat graft.

**Case 5:** A 42-year-old woman who had previously undergone abdominoplasty required a redo procedure because of severe upper abdominal eventration. Rectus diastasis was plicated and reinforced using a custom 30x10 cm plate with rectus fascia plication.

**Case 6:** A 52-year-old man with a history of previous abdominoplasty had upper abdominal eventration and a detected hernia defect. Repeat abdominoplasty repaired the rectus diastasis by plication and hernia using a custom 30x10 cm plate.

**Case 7:** A 48-year-old woman patient with a history of multiple regular vaginal deliveries underwent abdominoplasty because of

upper abdominal eventration, which was addressed with plication and reinforced by a custom 10x30 cm dermal fat graft and plication.

**Case 8:** A 43-year-old female, indicated for abdominoplasty with a history of multiple pregnancies and pulmonary thromboembolism, underwent rectus diastasis repair using a custom 15x15 cm dermal fat graft and plication.

**Results**

**Demographics and Characteristics:**

Eight patients underwent abdominal wall incisional hernia and rectus diastasis reconstruction during abdominoplasty using autologous dermal fat grafts. The details of patient demographics and hernia characteristics are outlined in (Table 2).

**Table 2.** Patients’ Demographics and Characteristics.

Name	Sex	age	Weight	Height	BMI
Patient 1	F	39.0	75.0	165.0	27.5
Patient 2	M	41.0	72.0	169.0	25.2
Patient 3	M	38.0	85.0	174.0	28.3
patient 4	F	48.0	85.0	170.0	29.4
Patient 5	F	42.0	78.0	164.0	29.0
Patient 6	M	52.0	89.0	170.0	30.0
Patient 7	F	48.0	82.0	165.0	30.0
Patient 8	F	43.0	84.0	163.0	32.0
Average		43.9	81.3	167.5	28.9



### Clinical Outcomes

As previously stated, a novel criterion was used to evaluate the outcomes, and the detailed criteria are depicted in (Table 3).

**Table 3.** Clinical Outcomes.

	Patient 1		Patient 2		Patient 3		Patient 4		Patient 5		Patient 6		Patient 7		Patient 8	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Panniculus	3	1	3	0	3	0	3	1	3	1	3	0	3	1	3	1
Striae	3	1	3	1	3	1	3	1	3	2	3	2	3	1	3	2
Bulking	3	0	3	0	3	1	3	1	3	1	3	0	3	1	3	1
Eventration	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	1
Patient Satisfaction	0	3	1	3	0	2	0	3	0	3	0	2	0	3	0	3
Surgeon Evaluation	1	3	0	2	0	3	1	3	0	2	1	3	0	2	0	2
Blind Evaluation	1	3	0	3	0	3	0	3	0	1	0	3	1	3	2	2

### Discussion

Managing abdominal wall incisional hernias and eventration in cases due to some causes such as pregnancy and obesity-weight loss poses considerable clinical challenges that often necessitate surgical intervention.

Our study aligns with previous research, such as that conducted by Giordano et al., which highlights the impact of obesity on abdominal wall reconstruction outcomes. Their findings indicate higher rates of postoperative complications, including surgical-site occurrences and skin dehiscence, among obese patients. However, despite these challenges, the study observed similar rates of hernia recurrence between obese and no obese patients during long-term follow-up. This suggests that while obesity may increase the risk of certain complications, it does not appear to affect the likelihood of hernia recurrence following abdominal wall reconstruction [12].

Since one of the components of abdominoplasty is the effective reconstruction of the abdominal wall, in the mentioned cases, the surgeon is faced with an eventuated abdomen that does not have strong rectus muscles for plication. Combining this repair with abdominoplasty—a procedure primarily focused on enhancing abdominal esthetics—provides a unique opportunity to address both cosmetic and functional aspects. As renowned craniofacial surgeon Dr. Paul Tessier emphasized, the gold standard for reconstruction involves the utilization of autologous tissues, a valid principle [13].

While previous studies by Harkins, Shaffer, and Eisele and Starkloff explored the use of skin grafts in hernia repair, it is essential to note that our research diverges from these historical approaches. These early investigations primarily focused on using cutis or skin grafts as reinforcing patches in repairing large ventral and incisional hernias. While informative for their time, these studies do not directly parallel our methodology. Our study introduces an innovative approach utilizing autologous dermal fat grafts during abdominoplasty to concurrently address multiple abdominal wall pathologies, such as

hernias and rectus diastasis. By incorporating dermal fat grafts harvested from surplus tissue excised during surgery, our technique offers a unique solution that combines functional and aesthetic outcomes in abdominoplasty procedures.

Thus, while we acknowledge the groundwork laid by previous studies, our approach represents a distinct advancement in abdominal wall reconstruction. In pursuit of a novel approach, we propose employing disposable tissue components as dermal fat grafts to reinforce the abdominal wall [14-16].

In pursuit of a novel approach, we propose employing disposable tissue components as dermal fat grafts to reinforce the abdominal wall. This retrospective case series, led by a single surgeon, explores autologous dermal fat grafting for incisional hernia reconstruction during abdominoplasty, shedding light on its feasibility, safety, and potential benefits.

One of our main goals was to evaluate the technical feasibility and safety of using autologous dermal fat grafts for hernia repair during abdominoplasty. Our findings suggest that this approach is technically viable. In all cases, the grafts were customized to fit the hernia dimensions without eliminating allergic reactions or complications typically associated with synthetic mesh repair, the study emphasizes the safety of autologous dermal fat grafting.

Moreover, the safety of this technique is reinforced by the belief that dermal fat grafts encourage tissue integration and vascularization, potentially reducing infection risks and other complications associated with synthetic mesh repair. This aligns with the modern trend in surgery, which focuses on using the patient's tissues to minimize complications and improve outcomes [17,18].

Autologous dermal fat grafting represents a paradigm shift in hernia repair by avoiding foreign materials such as synthetic mesh, substantially reducing risks such as infection and adhesion formation.

It not only addresses functional aspects but also aligns with patient-centered care and minimally invasive surgery principles [19,20].

Although our primary objective was hernia repair, achieving esthetic outcomes through abdominoplasty is equally significant. Combining both procedures provides a comprehensive transformation of the abdominal region.

Our case series demonstrates that autologous dermal fat grafting complements the esthetic goals of abdominoplasty, enabling patients to benefit from improved abdominal esthetics alongside resolved hernia-related functional issues. This dual benefit is crucial for overall patient satisfaction because it addresses abdominal wall health's cosmetic and functional aspects.

Patients seeking abdominoplasty often expect improved abdominal esthetics. Simultaneous repair of incisional hernias is particularly advantageous for patients who may have delayed hernia repair because of concerns about additional surgeries. A comprehensive solution in a single surgery meets and potentially exceeds patients' expectations.

Moreover, enhancing abdominal esthetics can positively influence the patient's overall quality of life by improving body image and self-esteem. The addition of hernia repair further contributes to patient well-being by alleviating discomfort and concerns related to hernias, leading to improved physical and emotional health [21].

It is crucial to evaluate postoperative complications and the risk of hernia recurrence. In this case-series, the complication rate was acceptable, and no graft-related complications were observed during follow-up. This suggests that autologous dermal fat grafting is a safe option for hernia reconstruction during abdominoplasty.

Although our study recorded no instances of hernia recurrence during the follow-up period, acknowledging the limitations of our retrospective case series, including a relatively short follow-up duration, is essential. A more extended and robust follow-up would be necessary to assess hernia recurrence rates comprehensively.

The absence of hernia recurrence is significant for patient well-being and healthcare resources. A successful single-surgery approach that reduces the need for future hernia repairs eases physical burdens and leads to cost savings and efficient healthcare resource allocation.

However, acknowledging limitations is crucial. The retrospective and uncontrolled design introduces potential biases. The absence of a comparison group makes it difficult to definitively establish the superiority of autologous dermal fat grafting over traditional hernia repair techniques during abdominoplasty. Moreover, the relatively

limited sample size and data from a single surgeon's practice may limit the generalizability of our findings.

Future research should consider prospective, controlled studies with larger sample sizes to investigate the safety and long-term efficacy of autologous dermal fat grafting for incisional hernia reconstruction during abdominoplasty. Comparative studies evaluating outcomes and patient satisfaction relative to traditional hernia repair techniques would be invaluable in understanding the potential benefits of this innovative approach.

## Conclusion

In conclusion, autologous dermal fat grafting for incisional hernia reconstruction during abdominoplasty is an innovative approach promising to achieve functional and cosmetic goals. Our retrospective case series provides initial evidence of its feasibility, safety, and potential benefits. However, further research is crucial to validate these findings and establish long-term outcomes.

This technique's ability to address both esthetic and functional concerns in a single surgical procedure aligns with patient-centered care principles. Although challenges exist, the potential advantages of this approach warrant continued investigation and refinement to optimize patient outcomes.

Embracing innovative approaches that enhance patient satisfaction and minimize complications is essential in evolving surgical practices. Autologous dermal fat grafting during abdominoplasty for incisional hernia reconstruction represents a promising advancement in plastic and reconstructive surgery. With ongoing research and refinement, this technique may become integral in addressing functional and cosmetic abdominal concerns, benefiting patients and healthcare systems.

## Compliance with ethical approval

**Conflict of Interest Statement:** The authors declare no conflicts of interest to disclose.

## Statement of human and animal rights or ethical approval:

This Research Study is approved by the Ethical Committee of the Isfahan University of Medical Sciences (IR.MUI.MED.REC.1402.448).

**Informed consent:** Informed consent was obtained from all participants in their native language, Persian.

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