

Patient Satisfaction after Abdominoplasty: A Retrospective Study of 323 Cases

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Abstract

Original Research Article

Background: Abdominoplasty is one of the most frequently performed body contouring procedures, and patient satisfaction has become a key outcome measure. Local data are scarce. We aimed to assess outcomes and patient satisfaction after abdominoplasty combined with liposuction in a plastic surgery department in Agadir, Morocco. **Methods:** This retrospective, descriptive, single-centre study included 323 patients operated on between January 2023 and December 2025. Data were collected from medical records using a standardized data collection form. Satisfaction was rated on a three-level scale by the patients and by a plastic surgeon other than the operating surgeon. **Results:** Mean age was 40.5 years (range, 24–57 years); 98.8% of patients were women, and mean body mass index (BMI) was 28 kg/m². Rectus diastasis (66.3%) and abdominal wall hernia (11.8%) were the most frequent abdominal wall abnormalities. Early complications included skin necrosis (6%), seroma (3.4%) and infection (4%), with no haematoma, venous thromboembolism or death. Late complications included lateral skin excess (3.7%), scar defects (5.8%) and umbilical malposition (5.6%). A reduction in back pain was reported by 88.5% of patients, and improved digestive and respiratory function by 75%. Overall, 89% of patients (288/323) were satisfied, including 62% who were very satisfied, whereas 10.8% were dissatisfied. Surgeons were very satisfied in 80.2% of cases. The main reasons for dissatisfaction were the residual scar (55%), insufficient dermolipectomy (14%) and umbilical position (11%). **Conclusion:** Abdominoplasty combined with liposuction provides substantial aesthetic, functional and psychological benefits, with a high satisfaction rate and a low rate of severe complications. The scar remains the main source of dissatisfaction. Thorough preoperative counselling and expectation management are essential.

Keywords: abdominoplasty; patient satisfaction; aesthetic outcomes; quality of life.

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INTRODUCTION

Abdominoplasty is a plastic surgery procedure that corrects excess skin and fat and laxity of the abdominal wall, most often resulting from pregnancies, major weight fluctuations or ageing. It is among the most frequently performed body contouring procedures [1]. Beyond improving body contour, it meets a growing functional and psychological demand: prospective studies have reported improvements in body image, self-esteem and mental health after abdominoplasty [2,3].

From a functional standpoint, rectus diastasis, frequently promoted by pregnancy, alters the biomechanics of the abdominal wall and may cause functional discomfort in addition to aesthetic concerns [4–6]. Its correction by plication may improve certain postural and psychological parameters [7].

In this context, the patient's own assessment and perception of bodily change have become essential criteria of success, on a par with the technical appraisal of the result. Satisfaction is, however, a multidimensional construct, encompassing the morphological result, the occurrence of complications, preoperative expectations and the patient's psychological experience. Local data on this subject are scarce. The aim of this study was to evaluate outcomes and patient satisfaction after abdominoplasty combined with liposuction in a large consecutive series of 323 patients operated on in a plastic surgery department in Agadir (Morocco), and to identify the main reasons for dissatisfaction.

PATIENTS AND METHODS

Study design and population

This was a retrospective, descriptive, single-centre study conducted in the Department of Plastic,

Reconstructive and Aesthetic Surgery of Oued Eddahab Military Hospital, Agadir, over a 36-month period (January 2023 – December 2025). All patients who underwent abdominoplasty combined with liposuction for abdominal lipodystrophy with a marked abdominal apron (pannus), and in whom abdominal wall repair was indicated, were included. Patients with other abdominal wall abnormalities (tumours, tissue loss), those who underwent isolated liposuction without abdominoplasty, and those with incomplete medical records were excluded. A total of 323 patients were included in the analysis.

Data collection

Data were collected from medical records and operative registers using a standardized data collection form. All patients operated on during the study period were contacted by telephone. The variables studied included sociodemographic characteristics; medical, surgical and obstetric history; body mass index (BMI, categorized according to World Health Organization thresholds [8]); pannus grade; musculoaponeurotic abnormalities; operative data; postoperative course; complications; aesthetic, functional and psychological outcomes; and satisfaction.

Preoperative assessment and preparation

At least two consultations, separated by a minimum interval of two weeks, preceded surgery. The assessment comprised a full history, a general and morphological clinical examination, and an anaesthetic consultation. A nutrition consultation was systematic for

patients with a BMI above 30 kg/m², and diabetes was brought under control before surgery. The pannus was classified into four grades according to its extent (Table 3). Standardized photographs (frontal, lateral and three-quarter views, in the standing position) were taken after informed consent [9]. Skin marking was performed with the patient standing, according to the 7-cm rule, and the liposuction areas were also marked.

Surgical technique

All patients were operated on under general anaesthesia with orotracheal intubation, in the supine position, using the same technique: classic abdominoplasty with transverse fusiform resection and umbilical transposition, always preceded by abdominal liposuction after infiltration with epinephrine-containing saline solution. After incision along the markings, the excess skin and fat was resected en bloc, and undermining was carried out in the suprafascial plane, preserving a thin layer of fat, until the umbilical stalk, surrounded by a cuff of fat, was identified. Supraumbilical undermining, in the “Eiffel Tower” fashion, was extended to the xiphoid process. Abdominal wall repair consisted of plication of the rectus muscles in cases of diastasis, primary suture repair in cases of small hernia, and placement of a dual-sided mesh in cases of large hernia, in collaboration with a visceral surgeon. The umbilicus was then repositioned. Closure was performed in two layers (buried inverted subcutaneous sutures followed by an absorbable running intradermal suture), with systematic placement of Redon suction drains and a compression garment (Figure 2).

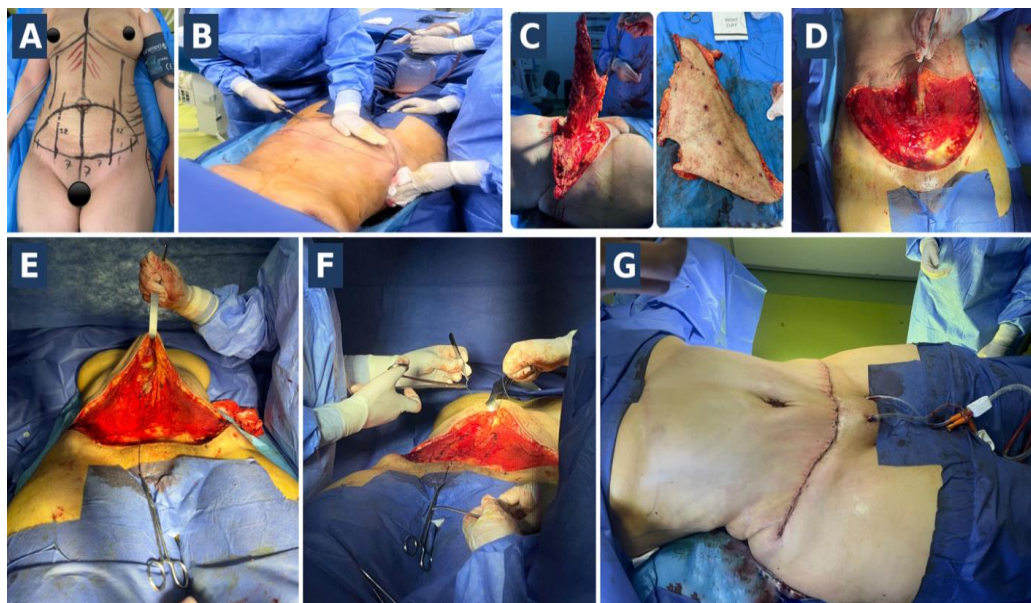


Figure 2: Operative steps of abdominoplasty. A. Preoperative skin marking. B. Intraoperative abdominal liposuction. C. Incision and en bloc excision of the excess skin and fat. D. Flap undermining and isolation of the umbilicus. E. Supraumbilical undermining in the “Eiffel Tower” fashion. F. Repair of rectus diastasis. G. Closure and placement of suction drains

Postoperative care and follow-up

All patients received thromboprophylaxis with low-molecular-weight heparin at a preventive dose for ten days, together with compression stockings worn from

the preoperative period, as well as antibiotic therapy with amoxicillin–clavulanic acid (7 days) and intravenous analgesia followed by oral analgesia. Patients were first mobilised on postoperative day 1, and the drains were

removed after 48 hours on average. A compression garment was worn day and night for one month, then for 12 hours a day for three months. Follow-up consisted of two visits per week until wound healing, then reviews at 3 months, 6 months and 1 year.

Outcome measures

Complications were classified as early or late. Aesthetic outcomes were assessed on scar quality, the presence of lateral “dog-ears”, abdominal contour, tone of the abdominal wall and umbilical position. Functional outcomes were based on the reduction of dorsolumbar pain, the improvement of digestive and respiratory function and the restoration of abdominal muscle function; psychological outcomes comprised self-confidence, body image and overall quality of life, as reported by the patients. Satisfaction with the final result was recorded on a three-level scale (very satisfied, satisfied, dissatisfied [poorly or not satisfied]), both from the patient and from a plastic surgeon other than the principal operating surgeon. Reasons for dissatisfaction were analysed through an in-depth review of the records

of dissatisfied patients. No validated questionnaire was used.

Statistical analysis and ethics

The analysis was descriptive: qualitative variables are expressed as counts and percentages, and quantitative variables as means and ranges. Anonymity and confidentiality of the data were ensured during data collection.

RESULTS

Patient characteristics

The mean age of the 323 patients was 40.5 years (range, 24–57 years), with a peak frequency in the 35–39-year age group ($n = 89$). The series comprised 319 women (98.8%) and 4 men (1.2%). Mean BMI was 28 kg/m²; 72% of patients ($n = 243$) had a BMI between 25 and 29 kg/m² (Figure 1). Socioeconomic status was rated as good in 60% of patients, average in 30% and low in 10%.

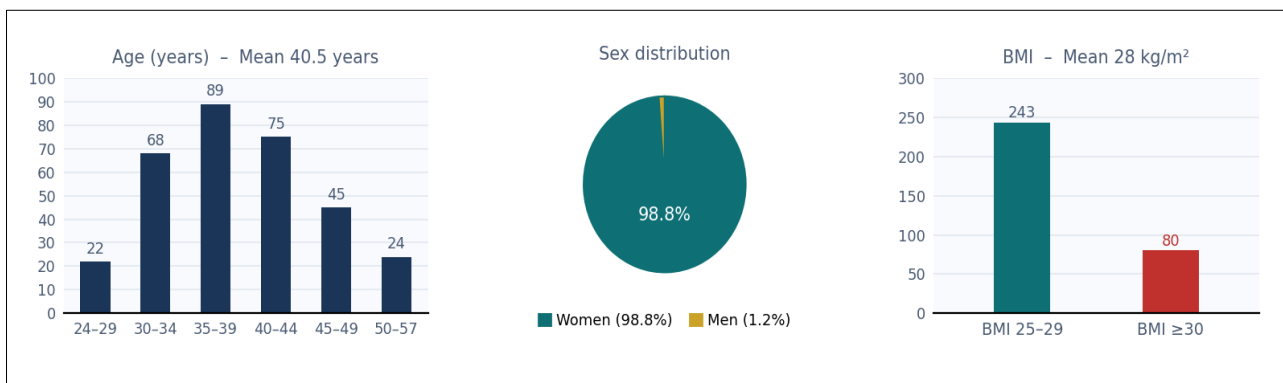


Figure 1: Demographic and anthropometric characteristics of the study population ($n = 323$). A. Age distribution. B. Sex distribution. C. BMI distribution

Medical and surgical history

The medical history was dominated by obesity (76.47%), hormonal contraception (52%) and diabetes (29%); 18.2% of patients were smokers (Table 1). No

history of thromboembolism was noted. With regard to obstetric and surgical history, 90.3% of the women had had at least one pregnancy, and caesarean section was the most frequent surgical history (53%) (Table 2).

Table 1: Distribution of patients according to medical history ($n = 323$)

Medical history	No. of patients	%
Diabetes	68	21%
Hormonal contraception	168	52%
Smoking	59	18.2%
Asthma	34	10.5%
Hypertension	7	2.16%
Endocrine disorder	4	1.23%

Table 2: Distribution of patients according to surgical history ($n = 323$)

Surgical history	No. of patients	%
Caesarean section	171.2	53%
Hernia	38	11.8%
Appendicectomy	17	5.2%
Cholecystectomy	22	6.8%

The percentage of women who had had at least one pregnancy was 90.3%.

Clinical examination: pannus and musculoaponeurotic wall

The distribution of patients according to pannus grade is presented in Table 3 and Figure 3: half of the patients were grade 1 (n = 162) and a quarter grade 2 (n

= 80). Abnormalities of the musculoaponeurotic wall (Figure 4) were dominated by rectus diastasis (n = 214; 66.3%), followed by abdominal wall hernias (n = 38; 11.8%). No incisional hernia was recorded.

Table 3: Classification of the pannus and distribution of patients (n = 323)

Grade	Description	No. (%)
1	Limited to the lower abdomen, above the pubis	197 (61%)
2	Completely covers the pubis and extends towards the upper thighs	113 (35%)
3	Covers the pubis and thighs down to mid-thigh level; visible under clothing	9 (2.78%)
4	Extends beyond mid-thigh level; difficulty walking	4 (1.23%)

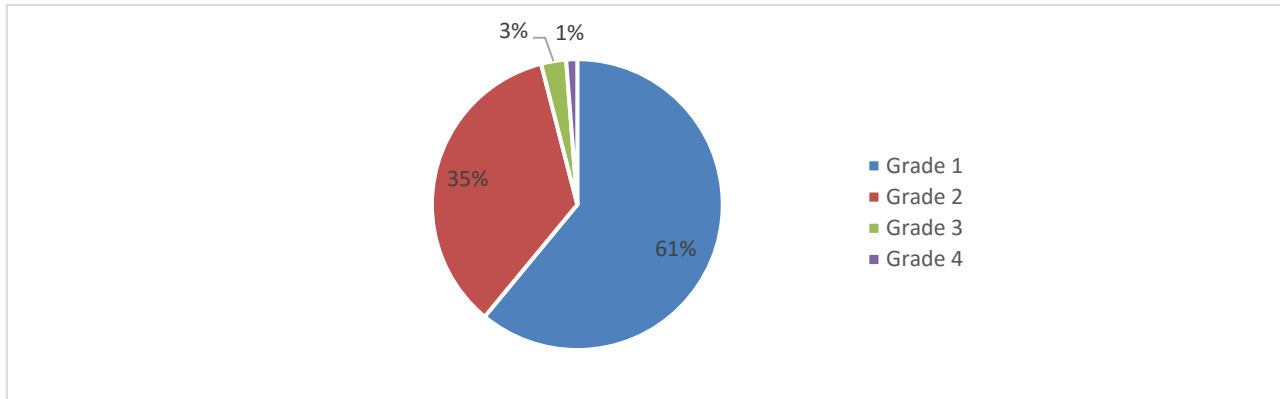


Figure 3: Distribution of pannus grades (n = 323)

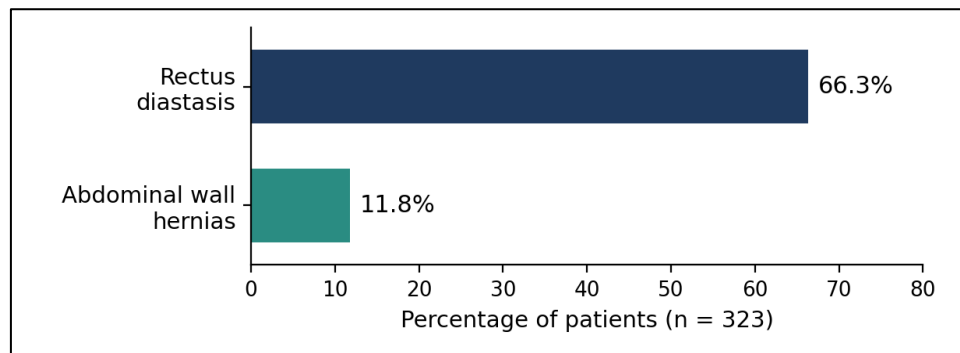


Figure 4: Abnormalities of the musculoaponeurotic wall (percentage of the 323 patients)

Operative data and early outcomes

All patients were operated on under general anaesthesia, with liposuction performed in the supine position and umbilical transposition. Rectus plication was performed in 214 patients, a dual-sided mesh was placed in 22 patients with large hernias, and simple primary suture repair was performed in 16 patients with small hernias. Two-layer closure, Redon drains and a compression garment were used in all patients. Twenty-two patients (6.8%) required a transfusion. The length of hospital stay was 2 to 3 days; convalescence before resumption of daily activities ranged from 4 to 6 weeks (mean, 5 weeks).

Complications

No haematoma, thromboembolic event or death was observed. Early complications comprised 19 cases of skin necrosis (6%), 11 seromas (3.4%) and 13 infections (4%), 8 of which occurred in diabetic patients. Late complications comprised lateral skin excess (“dog-ears”) in 12 patients (3.7%), hypertrophic scars in 19 patients (5.8%), umbilical malposition in 18 patients (5.6%) and an insufficient correction in 45 patients (14%). Reversible local hypoesthesia was noted in 85% of patients, with no case of permanent hypoesthesia (Table 4).

Table 4: Postoperative complications (n = 323)

Complication	No. of patients	%
<i>Early complications</i>		
Seroma	11	3.4%

Skin necrosis	19	6%
Infection	13	4%
Haematoma	0	0%
Embolism / venous thromboembolism / death	0	0%
Late complications		
Insufficient correction	45	14%
Lateral skin excess ("dog-ears")	12	3.7%
Hypertrophic scars	19	5.8%
Umbilical malposition	18	5.6%
Local hypoesthesia (reversible)	274	85%

Aesthetic, functional and psychological outcomes

The criteria for an inadequate aesthetic result are detailed in Table 5: unsightly scarring (5.8%) and lateral "dog-ears" (3.7%) were the most frequent. Functionally, 88.5% of patients reported a reduction in back pain, 75% an improvement in digestive and

respiratory function, and 50% a restoration of normal abdominal muscle function. Psychologically, all patients reported that a flatter and firmer abdomen had improved their self-confidence, body image and overall quality of life.

Table 5: Inadequate aesthetic outcomes (n = 323)

Criterion	No. of patients	%
Unsightly scar	19	7.4%
Lateral dog-ears	12	3.7%
Unsatisfactory abdominal contour	14	4.3%
Poor abdominal tone	9	2.8%
Malpositioned umbilicus	18	5.6%

Patient and surgeon satisfaction

Overall, 288 of 323 patients (89%) reported being satisfied with the result, of whom 62% were very satisfied and 27.2% satisfied; 10.8% (approximately 35 patients) were dissatisfied (poorly or not satisfied).

Evaluation by a plastic surgeon other than the operating surgeon rated 80.2% of results as very satisfactory, 17.5% as satisfactory and 2.3% as unsatisfactory (Table 6, Figure 5). Examples of results are shown in Figure 9.

Table 6: Patient and surgeon satisfaction

Satisfaction level	Patients (%)	Surgeons (%)
Dissatisfied	10.8	2.3
Satisfied	27.2	17.5
Very satisfied	62	80.2
Total	100	100

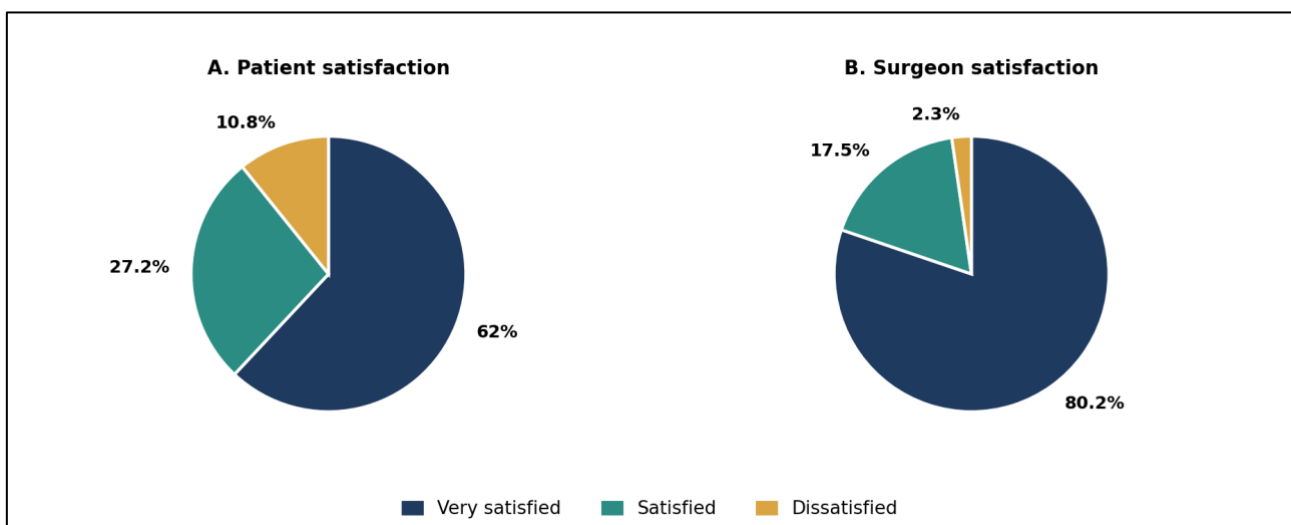


Figure 5: Distribution of satisfaction. A. Patients (n = 323). B. Surgeons

Reasons for dissatisfaction

Among the dissatisfied patients, 55% had presented for purely aesthetic reasons, 25% following bariatric surgery and 20% for functional reasons (Figure 6). The main reason for dissatisfaction was the residual scar (55%), followed by insufficient dermolipectomy

(14%), the position or size of the neo-umbilicus (11%) and skin necrosis (6%); 5% were dissatisfied for other reasons (Figure 7). Among the unsatisfactory scars, 49% were widened, 35% were asymmetric, 10% were keloid and 6% had undergone dehiscence (Figure 8).

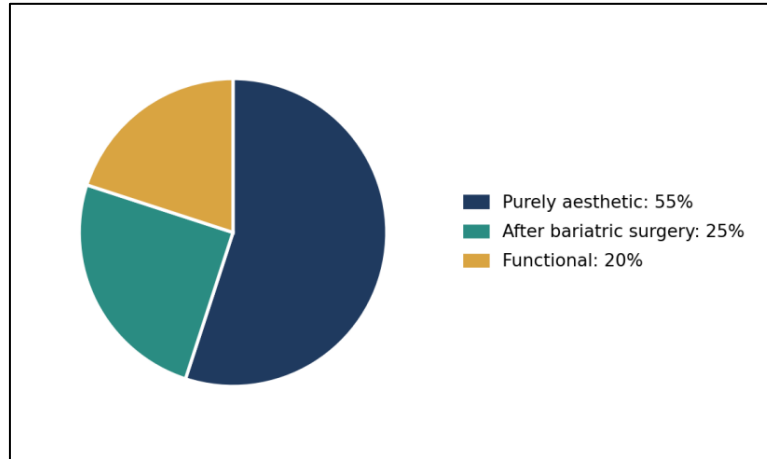


Figure 6: Distribution of dissatisfied patients according to the initial motivation for surgery

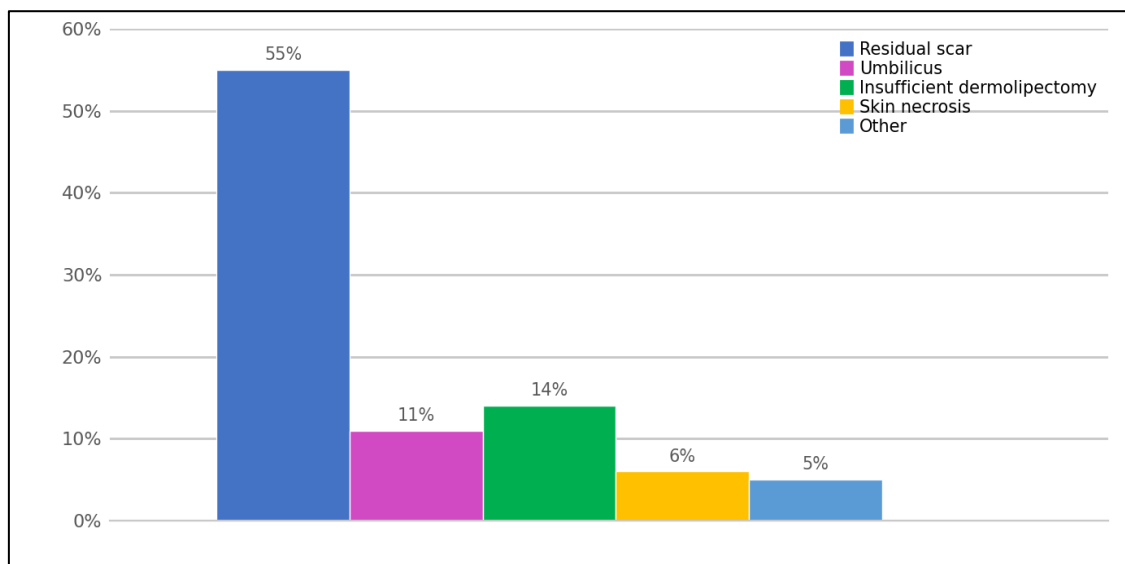


Figure 7: Distribution of reasons for dissatisfaction (percentage of dissatisfied patients)

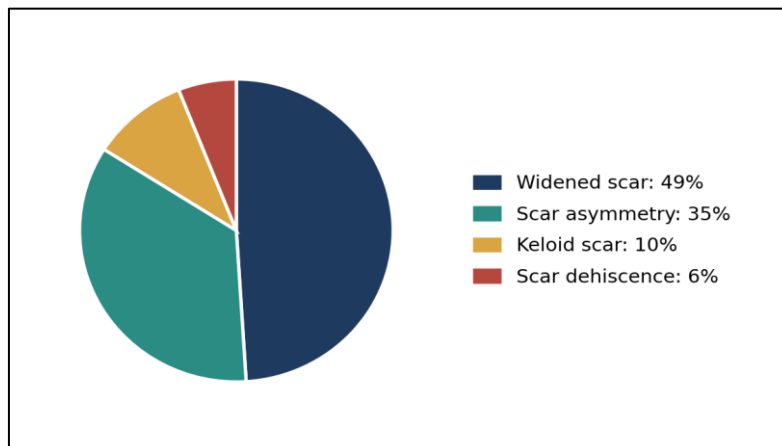


Figure 8: Distribution of unsatisfactory scars

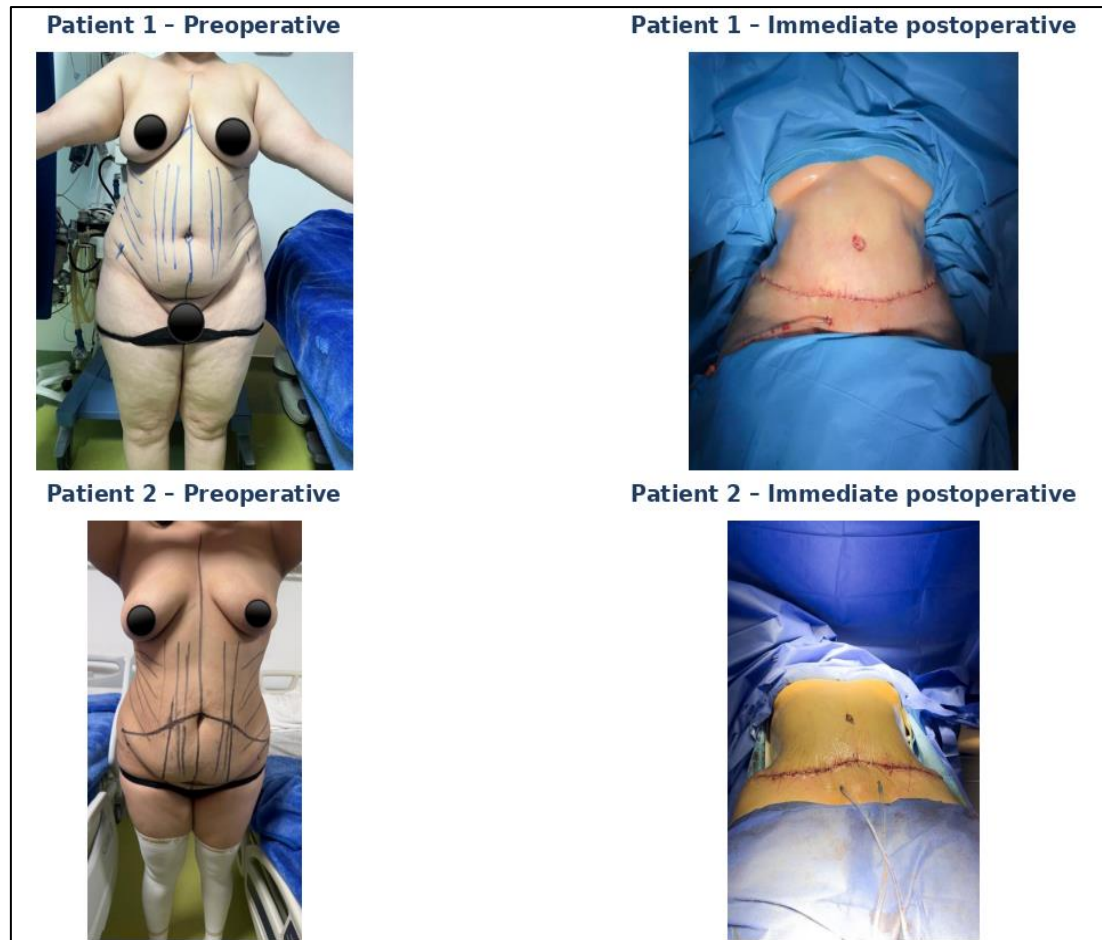


Figure 9: Preoperative and immediate postoperative results in two patients of the series

DISCUSSION

Main findings

This series of 323 abdominoplasties combined with liposuction, performed using a uniform technique, shows a high satisfaction rate (89%), together with a low rate of severe complications and a functional and psychological benefit reported by the patients. This satisfaction rate is consistent with the literature, which generally reports high rates, such as the 86% of satisfied patients in the consecutive series of 199 abdominoplasties by Hensel *et al.*, [10]. The improvements in body image, self-esteem and mental health described after abdominoplasty [2,3] are in line with our psychological findings, which, however, rely on a non-standardized, self-reported assessment.

Population profile

Our population, predominantly female (98.8%) and with a mean age of 40.5 years, reflects the classic profile of abdominoplasty candidates: repeated pregnancies cause progressive distension of the abdominal wall and promote rectus diastasis [4–6], which was found in two-thirds of our patients. The proportion of patients with a BMI between 25 and 29 kg/m² (72%) is notable. Obesity is classically associated with an increased risk of seroma and wound-healing

complications after abdominoplasty [11–13], which justifies requiring weight stability and preoperative optimisation of comorbidities [14]. Smoking (18.2% of our patients) is another recognised risk factor for wound-healing problems [15–17].

Complications

The complication rates in our series, compared with those of published series (Table 7), are overall low: 6% skin necrosis, 3.4% seroma, 4% infection, and no haematoma or thromboembolic complication. The absence of thromboembolic events may be related to the systematic prophylaxis combining low-molecular-weight heparin, compression and early mobilisation, in accordance with guidelines [18,19] and with data on thromboembolic risk in abdominal contouring surgery [20,21]. The low seroma rate may be partly explained by systematic suction drainage and prolonged compression; other strategies for dead-space reduction, such as progressive tension sutures or quilting, have been proposed [22–24]. These comparisons should be interpreted with caution, given the retrospective nature of our study, the risk of under-reporting of minor complications and the heterogeneity of definitions across series [10,13,25–27]. Lipoabdominoplasty, as performed in our series, has moreover been described as safe in several series [28,29].

Table 7: Comparison of complication rates (%) with series from the literature

Series	Year	N	Necrosis	Seroma	Infection	Haematoma	DVT/PE
Neaman <i>et al.</i> , [13]	2007	206	—	17.5	12.6	5.8	1
Hensel <i>et al.</i> , [10]	2001	199	—	—	6.5	1.5	—
Rodby <i>et al.</i> , [26]	2011	113	—	8.8	2.7	2.7	—
Momeni <i>et al.</i> , [27]	2009	139	—	—	7.2	—	—
Mejia <i>et al.</i> , [25]	2012	25	8	—	4	—	—
Present series	2026	323	6	3.4	4	0	0

DVT/PE: deep vein thrombosis / pulmonary embolism. —: data not reported.

Sources of dissatisfaction

In our series, the scar was the main reason for dissatisfaction (55% of dissatisfied patients); among the unsatisfactory scars, 49% were widened and 35% asymmetric. This finding underscores the importance of scar placement and management of skin tension; the high-lateral-tension technique with suspension of the superficial fascial system has been proposed to improve skin redraping and contour harmony [30]. Insufficient dermolipectomy was found in 14% of cases of dissatisfaction, which may reflect either technical undercorrection or high aesthetic expectations. The umbilicus (11%) is a reminder that its position, shape and inconspicuousness are an integral part of the result. Functional indications accounted for only 20% of the initial motivations of dissatisfied patients, whereas patients operated on for purely aesthetic reasons were the most represented (55%). In the absence of a denominator for each motivation group, our study cannot establish a higher rate of dissatisfaction in this group, but the finding is compatible with the hypothesis that preoperative expectations influence the perception of the result [3].

Functional benefits

A reduction in back pain was reported by 88.5% of patients and an improvement in digestive and respiratory function by 75%. These benefits are plausible in view of the biomechanical alterations induced by diastasis [6] and the postural changes observed after rectus plication [7]. These results are, however, based on patients' perception; confirmation with objective measurements would be desirable.

Clinical implications

Satisfaction depends as much on preoperative expectations as on the technical result. The preoperative consultation should therefore include an assessment of motivations and expectations, the presentation of photographs of favourable and unfavourable results, including scars, and advice on optimising wound healing. In Morocco, to our knowledge, there is no validated national patient information leaflet; the documents in use are inspired by the materials of foreign learned societies [31], which argues for the development of harmonised national documents. The success of the procedure thus rests on comprehensive care combining surgical technique, patient selection and communication.

Study limitations

This study has several limitations. Its retrospective, single-centre design limits the generalisability of the results and exposes it to selection bias and under-reporting of complications. The analysis is purely descriptive, without comparison or multivariable analysis of predictors of satisfaction. Satisfaction was assessed using a simple, non-validated three-level scale and collected at a distance from surgery, with potentially heterogeneous follow-up over a three-year inclusion period and a risk of social desirability bias when responses were collected. The use of a single technique precludes comparison of different approaches. Finally, the absence of a standardized patient-reported outcome measure (PROM), such as the BODY-Q, limits comparability with international studies.

Prospective multicentre studies using validated instruments and incorporating multivariable analysis would allow the determinants of satisfaction to be identified more precisely, and patient selection and information to be adapted accordingly.

CONCLUSION

In this series of 323 patients, abdominoplasty combined with liposuction effectively corrected the aesthetic and functional defects of the abdominal wall, with a satisfaction rate of 89%, a low rate of severe complications and a reported positive impact on self-confidence and body image. The scar remains the main factor limiting the perceived result. The quality of preoperative information, expectation management and rigorous selection of indications appear to be decisive. The use of standardized assessment tools in future prospective studies would allow a more objective and reproducible analysis of satisfaction.

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