

Dissection Technique for Abdominoplasty: A Prospective Study on Scalpel versus Diathermocoagulation (Coagulation Mode)

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Background: The purpose of this study was to evaluate the effect of the dissection technique on outcomes and complications after a full abdominoplasty, comparing 2 different techniques used to raise the abdominal flap: the steel scalpel and the diathermocoagulation device on coagulation mode.

Methods: A prospective study was performed at a single center from January 2009 to December 2011 of patients submitted to abdominoplasty with umbilical transposition. Two groups were identified: group A, abdominoplasty performed with steel scalpel/knife; and group B, abdominoplasty performed with diathermocoagulation on coagulation mode. Several variables were determined: general characteristics, time until drain removal, daily and total volume of drain output, length of hospital stay, operative time, readmission, reoperation, emergency department visits, and local and systemic complications.

Results: A total of 119 full abdominoplasties were performed in women (group A, 39 patients; group B, 80 patients). There were no statistically significant differences between groups with respect to general characteristics, except for body mass index, comorbidities, and weight of the surgical specimen; there were no differences for operative time, systemic complications, hematoma, and necrosis incidence. The scalpel group had a highly significant reduction of 54.56% on total drain output, and a 2.65 day reduction on time to drain removal and no reported cases of seroma or healing problems (difference of 81.25% and 90.00%, respectively, between the 2 groups).

Conclusions: Performing abdominal dissection with scalpel had a beneficial effect on patient recovery, as it reduced time requested for drain removal, total drain output, and incidence of seroma and wound healing problems. (*Plast Reconstr Surg Glob Open* 2015;3:e299; doi: 10.1097/GOX.0000000000000222; Published online 29 January 2015.)

Abdominoplasty is one of the most frequently performed plastic surgical procedures.¹ The surgeon should be aware of potential complications associated with abdominoplasty as they have

a high rate when compared with other aesthetic surgeries. Seroma is the most frequent, with reported incidence from 5% to 50%.²⁻⁶ Other complications are infection, hematoma, skin necrosis, delayed wound healing, fat necrosis, trauma of the lateral cutaneous nerve of the thigh, and general systemic complications.⁷⁻¹⁰ Multiple surgical strategies have been described to lower the complication rate, such as Scarpa fascia preservation,^{1,2,11-21} lipoabdominoplas-

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ty,^{22–24} selective undermining,^{23,25,26} internal fixation techniques,^{27–33} use of pressure dressings, and fibrin glue. The technique used to raise the abdominal flap (scalpel vs electrosurgery) has also been implicated, but there are few studies on the subject, none is prospective, and the results are contradictory.^{34,35} The majority of publications comparing the 2 techniques were mainly directed to the effects on the skin incision and not on the deep plane of dissection,^{36,37} despite some publications on the mastectomy field.^{38–40}

The purpose of this study was to prospectively evaluate the effect of the dissection technique on outcomes and complications after a full abdominoplasty, comparing 2 different techniques to raise the abdominal flap: the steel scalpel and the diathermocoagulation device on coagulation mode.

PATIENTS AND METHODS

A prospective study was performed including patients submitted to full abdominoplasty with umbilical transposition between January 2009 and December 2011 at the Department of Plastic, Reconstructive, Aesthetic and Maxillofacial Surgery, Centro Hospitalar São João/Porto University Medical School.

The patients included women who presented with abdominal deformities marked by excess abdominal skin and adipose tissue with muscle laxity and who met the criteria for a full abdominoplasty with umbilical transposition (Psillakis types III and IV and Matarasso types III and IV).^{41,42} Exclusion criteria were significantly elevated operative health risks, bariatric patients without weight stabilization for at least 6 months, patients who anticipate future pregnancy, and patients with a body mass index (BMI) over 30 kg/m², except for the ones with previous bariatric surgery.

The patients were allocated to each surgeon according to the department policy of patient distribution: sequential distribution, which involved all patients presenting for a plastic surgery consultation. So, there was no random distribution or randomized process of patient selection.

Two patient groups were identified: group A, patients who underwent a classic abdominoplasty with scalpel/knife dissection, and group B, patients who underwent a similar type of abdominoplasty except for the dissection technique, which was performed with monopolar diathermocoagulation on coagulation mode.

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Two surgical teams were involved in the study, 1 surgeon in the group A and 4 surgeons in the group B. All the surgeons were fully trained. The 2 groups were representative of 2 different surgical teams whose standard approach to the abdominal procedure differed only with respect of the dissection technique.

This study was approved by the Ethical Committee of Centro Hospitalar de São João/Porto University Medical School. All patients who accepted to enroll in this study signed informed consent documents.

Surgical Methods

All the patients included in this study were submitted to a full abdominoplasty with umbilical transposition and rectus abdominis muscle plication. Enoxaparin (40 mg/d subcutaneously during the hospital stay, starting at least 2 hours before surgery) and preoperative broad-spectrum intravenous antibiotics were administered routinely to all patients.

The preoperative markings and the surgical technique of the abdominoplasty are well described elsewhere and are well known.⁴³ The surgical technique began with preparing and draping the patient under general anesthesia. In both groups, the skin incision was done with steel scalpel and the abdominal flap was dissected in a preaponeurotic (premuscular) plane as traditionally described, sharply just above the aponeurosis, not preserving areolar tissue, to the level of the subcostal margin. The majority of patients were submitted to liposuction limited to the flanks, in both groups. No infiltration solution, abdominal liposuction, or quilting sutures were used. In group A, the dissection was performed with a conventional no. 24 scalpel, and in group B the dissection was performed with a diathermocoagulation device on coagulation mode (Erbe Icc 350 Electrosurgical Unit, Erbe, Germany; average voltage of 40–60 V; regular tip). In both groups, hemostasis was performed with monopolar diathermocoagulation on coagulation mode.

Two closed-suction drains were used in all patients, both located on the lower abdomen and flanks, one in each side. The intraoperative and postoperative care was the same in both groups. The patients were motivated to ambulate on the first postoperative day and were only discharged after drain removal. Compression garments were routinely applied in the operating room and used for at least 6 weeks; strenuous activity was avoided.

Outcomes

The outcomes measured in this study included time to drain removal, daily and total volume of drain output, operative time, length of hospital stay,

incidence of systemic complications, incidence of local complications, emergency department visit, second admission to the hospital, and secondary surgical procedures (excluding scar revision). Drain output volume was registered daily at the same time by a nurse (7 AM), who was not aware of the type of dissection performed.

The complications were designated as local or systemic. Systemic complications were defined as need for blood transfusion, pulmonary fat embolus syndrome, thromboembolic complications (deep vein thrombosis/pulmonary thromboembolism), and death. Local complications included seroma, hematoma/bleeding, wound infection, healing problems/wound dehiscence without necrosis, and skin necrosis. Seroma was defined clinically as a subcutaneous abdominal wall fluid collection evident on physical examination after drain removal that was successfully aspirated at least once (non-hematic clear fluid). Hematoma was defined as a subcutaneous abdominal wall fluid collection evident on physical examination that was successfully aspirated at least once (hematic fluid). After hospital discharge, patients were observed by 1 of the 5 surgeons enrolled on the trial at 2 weeks, 1 month, and 6 months after surgery.

Statistical Analysis

Statistical analysis was performed using IBM SPSS v21.0 (SPSS, Inc., Chicago, Ill.). For continuous variables, parametric tests were used when verifying the follow assumptions: variance homogeneity according to Levene’s test and distribution normality according to histogram visual analysis. When one of these assumptions was not verified, the nonparametric tests were used. Mean ± SD and range were determined for continuous variables.

Chi-square test was used to analyze categorical variables, and Student’s *t* test, analysis of variance, or equivalent nonparametric tests (Mann-Whitney *U* test and Kruskal-Wallis test) were used when assessing significance upon continuous variables. Univariate and multivariate analyses were performed.

For the dependent variables (seroma, hematoma, healing problems and necrosis rates, total drain output, and time to drain removal), the effect of the 2 independent variables (effect of the procedure and effect of the surgeon) was evaluated, using the chi-square test for local complications rates and the Kruskal-Wallis test for the total drain output and time to drain removal. For all of them, there were no statistical differences on outcomes by surgeon (among the 4 surgeons on diathermocoagulation group)—the surgeon’s effect was not statistically significant (*P* > 0.05).

RESULTS

A total of 119 full abdominoplasties were performed. All the patients were women: group A, 39 patients; group B, 80 patients. Patients in group A were operated on by 1 surgeon; in group B, each surgeon performed 20 abdominoplasties.

Patient characteristics are summarized in Table 1. In group A, the average BMI was significantly higher than that in group B (27.74 ± 2.92 kg/m² vs 25.38 ± 2.93 kg/m²; *P* < 0.0001); the presence of comorbidities was also significantly different in both groups, 47.37% in group A and 21.25% in group B (*P* = 0.004). The mean specimen weight was also higher in group A (1366.14 ± 667.77 g) than in group B (1087.47 ± 500.44 g; *P* = 0.033). There was no statistical difference regarding smoking (a patient was considered a “nonsmoker” if she had never smoked or had stopped smoking 4 weeks before surgery) and

Table 1. General Characteristics of Both Groups (n = 119)*

	Group A	Group B	<i>P</i>
Age, y			NS
Mean ± SD	41.03 ± 8.07	38.50 ± 9.27	
Range	24.00–59.00	23.00–68.00	
BMI, kg/m ²			<0.0001
Mean ± SD	27.74 ± 2.92	25.38 ± 2.93	
Range	22.10–34.90	19.10–33.70	
Smoker, total <i>n</i> (%)	2 (5.26)	5 (6.25)	NS
Previous abdominal operations, total <i>n</i> (%)	31 (81.58)	56 (70.00)	NS
Previous bariatric surgery, total <i>n</i> (%)	9 (23.68)	12 (15.00)	NS
Medical comorbidities, total <i>n</i> (%)	18 (47.37)	17 (21.30)	<0.05
Weight specimen, g			<0.05
Mean ± SD	1366.14 ± 667.77	1087.47 ± 500.44	
Range	250.00–2850.00	330.00–2700.00	

The incidence of previous operations, previous bariatric surgery, smoking habits, and comorbid medical conditions was compared between both groups using the chi-square test. The other variables were compared using the *t* test.

*Group A, scalpel dissection (*n* = 39); group B, diathermocoagulation device on coagulation mode dissection (*n* = 80).

NS, not significant (*P* > 0.05).

previous abdominal operations (previous abdominal surgeries included bariatric surgery, cesarean section, hysterectomy, tubal ligation and other gynecological surgery, and appendectomy).

The outcomes are summarized in Table 2. There was a statistically significant difference between group A and group B concerning the time to drain removal (2.65-day reduction in group A) (Fig. 1), the total volume of drain output (54.56% reduction in group A), and the duration of hospital stay (1.90-day reduction in group A). In group A, no patient had to use drains for more than 6 days, whereas in group B the maximum period with drains was 21 days. Concerning operative time, the 2 groups did not present statistical differences.

The daily evolution of drain output is presented in Figure 2. The daily drain outputs were significantly lower when the scalpel was used, and this difference was statistically significant on postoperative day 2 (mean \pm SD, 90.53 \pm 48.98 mL vs 138.0 \pm 79.70 mL; $P=0.001$) and day 3 (mean \pm SD, 65.76 \pm 46.69 mL vs 110.13 \pm 73.07 mL; $P<0.001$).

The complications of both groups are presented in Table 3. In group A, 10.26% of the patients presented local complications versus 26.25% of the patients in group B, difference with statistical significance ($P<0.05$; Table 3).

Concerning local complications, there were no cases of seroma (reduction from 15 occurrences to none) and no healing problems (reduction from 8 occurrences to none) in group A. These differences had statistical significance ($P<0.05$; Table 3). Despite no statistical significance, there was a trend to higher infection incidence in the diathermocoagulation group, with no reports in group A, and a trend to higher necrosis in group A. The other variables,

including hematoma/bleeding, did not differ significantly between groups.

In a multivariate analysis, using multiple linear regression for continuous outcomes (total drain output and time to drain removal) and logistic regression for categorical/binary outcomes (seroma and wound healing problems rates), only the dissection technique (scalpel vs diathermocoagulation) had statistical impact in all outcomes ($P<0.05$) (Table 4).

Comparing systemic complications incidence, there was need of blood transfusion in a patient in group B; there were no other systemic complications in both groups, including fat embolism, thromboembolic complications (deep vein thrombosis/pulmonary thromboembolism), and death.

There were no reported cases of emergency department visits, readmissions, and reoperations in group A, despite these differences did not have statistical significance among the 2 groups (Table 2). A single case of reoperation occurred in group B, corresponding to an infected seroma. Two patients from group B had to be readmitted to the hospital with seromas; in the same group, 5 patients needed unscheduled visits (4 patients because of seroma and 1 patient for infection).

DISCUSSION

Due to its popularity and high complication rate, abdominoplasty techniques have undergone a continuous process of evolution over the last years to provide better and safer results.

Two different dissection techniques are currently available to raise the abdominal flap: diathermocoagulation or steel scalpel/knife. The surgeon's preference has been the basis for deciding which one to use

Table 2. Outcomes of Both Groups ($n = 119$)*

	Group A	Group B	<i>P</i>
Time until drain removal, d			<0.0001
Mean \pm SD	3.59 \pm 2.01	6.24 \pm 3.44	
Range	2.00–6.00	2.00–21.00	
Drain output, mL			<0.0001
Mean \pm SD	276.84 \pm 130.65	609.25 \pm 460.21	
Range	90.00–685.00	90.00–2925.00	
Operative time, min			NS
Mean \pm SD	87.16 \pm 24.11	89.97 \pm 17.56	
Range	45.00–150.00	48.00–149.00	
Hospital stay, d			<0.001
Mean \pm SD	4.79 \pm 2.07	6.69 \pm 3.19	
Range	3.00–7.00	2.00–20.00	
Emergency department visit, total <i>n</i> (%)	0 (0)	5 (6.3)	NS
Readmission, total <i>n</i> (%)	0 (0)	2 (2.5)	NS
Reoperation, total <i>n</i> (%)	0 (0)	1 (1.3)	NS

The time until drain removal, operative time, and hospital stay were compared between both groups using the Mann-Whitney *U* test. The drain output was compared using the *t* test. The other variables were compared using the chi-square test.

*Group A, scalpel dissection ($n = 39$); group B, diathermocoagulation device on coagulation mode dissection ($n = 80$).

NS, not significant ($P>0.05$).

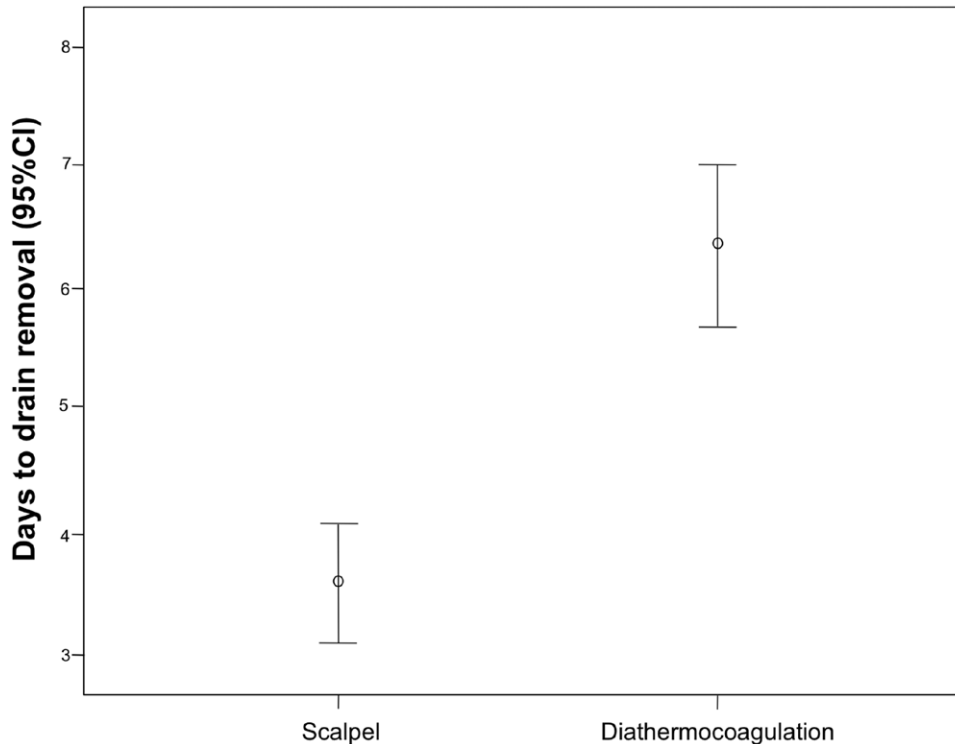


Fig. 1. Time to drain removal (days) in both groups: scalpel and diathermocoagulation device on coagulation mode; 95% confidence interval. There was a significant reduction on time until drain removal in scalpel group ($P < 0.0001$, Mann-Whitney U test).

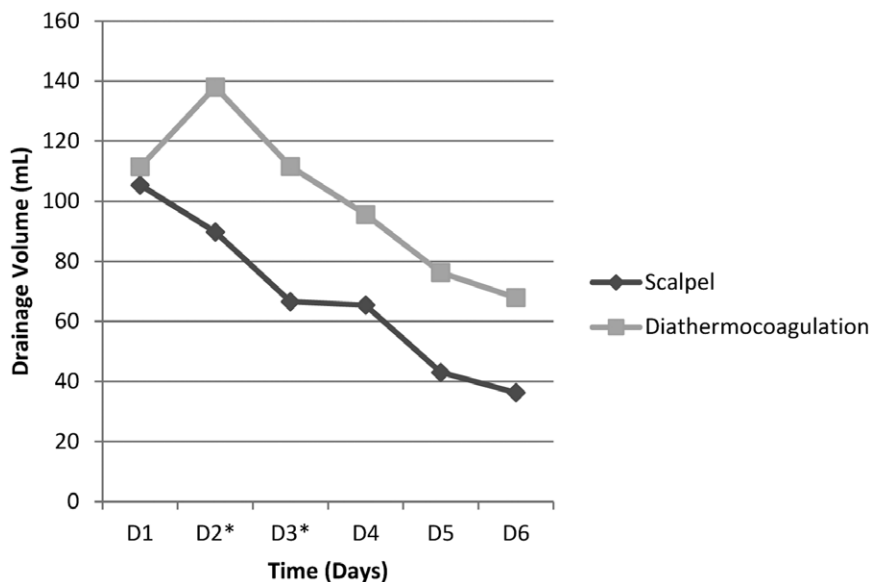


Fig. 2. Average daily drain output (mean \pm SD) from group A (scalpel dissection, $n = 39$) and group B (diathermocoagulation on coagulation mode, $n = 80$). Drain outputs were significantly lower in group A on postoperative days 2 and 3 ($P < 0.05$, t test).

as there are no solid scientific data to substantiate the supremacy of one technique over the other. There are some potential advantages and disadvantages of both techniques. The scalpel/knife is supposed to give a more precise surgical dissection⁴⁴ and to reduce the

thermal injury produced by the diathermocoagulation by limiting its use to the control of hemostasis.³⁵ On the other hand, diathermocoagulation is expected to provide a bloodless dissection, a potential shorter operative time and lower risk of hematoma.^{34,35}

Table 3. Outcomes: Local and Systemic Complications of Both Groups (n = 119)*

	Group A	Group B	P
No. patients	39	80	
Local complications, total n (%)	4 (10.26)	21 (26.25)	<0.05
Seroma	0 (0)	15 (18.75)	<0.05
Hematoma/bleeding	2 (5.13)	5 (6.25)	NS
Infection	0 (0)	6 (7.50)	NS
Healing problems without necrosis	0 (0)	8 (10.00)	<0.05
Necrosis	2 (5.13)	0 (0)	NS
Systemic complications, total n (%)	0 (0)	1 (1.25)	NS
Blood transfusion	0 (0)	1 (1.25)	NS
Fat embolism	0 (0)	0 (0)	NS
Deep venous thrombosis/pulmonary thromboembolism	0 (0)	0 (0)	NS
Death	0 (0)	0 (0)	NS

The variables were compared between both groups using the chi-square test.

*Group A, scalpel dissection (n = 39); group B, diathermocoagulation device on coagulation mode dissection (n = 80).

NS, not significant (P > 0.05).

Table 4. Multivariate Analysis of the Outcomes

	Multiple Linear Regression		Logistic Regression	
	Drain Output, mL	Time until Drain Removal, d	Seroma (%)	Healing Problems (%)
	P		P	
Age, y	0.737	0.351	0.280	0.177
BMI, kg/m ²	0.695	0.062	0.115	0.046*
Smoking, total n (%)	0.506	0.579	0.295	0.437
Previous abdominal operations, total n (%)	0.513	0.051	0.987	0.456
Previous bariatric surgery, total n (%)	0.190	0.710	0.679	0.190
Medical comorbidities, total n (%)	0.345	0.319	0.108	0.757
Weight specimen, g	0.137	0.053	0.102	0.308
Dissection technique	0.027*	0.041*	0.005*	0.042*

Multiple linear regression for continuous variables; logistic regression for categorical variables; 95% confidence interval.

*Statistical significance (P < 0.05).

The diathermocoagulation can be used to dissect on 2 different modes: coagulation or cutting. The first one differs from the second because it is an interrupted modulated and damped current that begins with a high pulse that quickly dissipates, originating lower thermal injury and possible lower postoperative collections including seromas; the cutting mode relies on a continuous unmodulated and nondamped sine waveform.³⁴ There are still no prospective studies comparing coagulation and cutting modes when performing an abdominoplasty.³⁴ On the other hand, there are some experimental studies on skin incision comparing conventional devices (scalpel/knife and electrosurgery) and PEAK PlasmaBlade (PEAK Surgical, Inc., Palo Alto, Calif.), which is a radiofrequency system, which allows cutting and coagulating, in a way that modulates tissue destruction, diminishing the thermal injury associated with conventional electrosurgery. Despite these improvements, the quality of scar incision was better with the scalpel/knife, due to no thermal injury.^{44,45}

The present study provides evidence that raising the abdominal flap with the steel scalpel/knife has clinically and statistically significant advantages,

when compared with diathermocoagulation (coagulation mode):

Drain output is reduced (55% reduction).

Suction drains can be safely removed earlier (2.7 days earlier).

There are no long drainers (patients with > 6 days with drains).

Seroma incidence is reduced (no reported cases vs 18.8%).

Healing problems incidence is reduced (no reported cases vs 10.0%).

Interestingly, the operative time was not prolonged and no increase on hematoma/bleeding incidence was observed when the scalpel was used.

When raising the abdominal flap by either of these techniques, inflammation of underlying tissues will follow.⁴⁴ More inflammation of underlying tissues produces higher volumes of serous fluid due to its exudative nature.⁴⁶ This fluid collection, if not controlled, for example, by suction drainage or quilting sutures, leads to an increase of tissue pressure until the small vessels of the dermis become compressed,

reducing local tissue perfusion, which will eventually delay wound healing and carry a risk of flap necrosis and wound infection.³³ This process is more evident when the diathermocoagulation is used, due to its associated thermal injury.^{44,45} This difference could be an explanation for the results presented, namely lower fluid production, less fluid collections, and healing problems with the steel scalpel/knife.

Another possible explanation for our results is that the potential thermal injury of diathermocoagulation to adjacent structures, like small vessels and lymphatics, could be responsible for worsening the lymphatic drainage and consequently for a higher fluid accumulation, higher volumes collected in suction drains, and higher seroma incidence when comparing the 2 groups. These results are in accordance with the ones from Rousseau et al (Table 5).³⁴ In a retrospective study with 647 patients submitted to abdominoplasty, the dissection technique was compared, scalpel versus diathermocoagulation (cutting mode). These authors found a significant reduction of noninfectious collections (hematoma and seroma) and drain output when the scalpel was used. It is important to notice that the same study also showed a significant increase on operative time with the steel scalpel/knife. Our findings are different and show that identical times can be obtained with both techniques of dissection. Proper familiarity with the blade dissection (used without vasoconstrictive solutions) allows a bloodless dissection, proving that a coordinate effort can exist among the surgeon, the assistant, and the nurse assistant so that adequate monopolar hemostasis is performed expeditiously. Identical surgical times can thus be achieved.

Araco et al³⁵ (Table 5) retrospectively compared the 2 dissection techniques (scalpel vs diathermocoagulation) in a postbariatric population ($n = 137$) and verified a significant increase on hematoma incidence when the steel scalpel was used (1.10% vs 12.8%) and no difference on the incidence of seroma or wound healing problems. In this study, the group dissected with the scalpel had the abdomen infiltrated with Klein solution. It is important to remember that electrosurgery does not work as well in tumescent tissue. In our study, there was no increased incidence of hematoma/bleeding with the scalpel, and it is important to recall that no Klein solution was used to infiltrate the abdomen. We think this is an important aspect to achieve an efficient hemostasis of the surgical field as potential bleeders are not concealed by a temporary vasoconstriction. Infiltration with the Klein solution makes the identification of blood vessels, hidden within the swollen and moist tissues, more challenging. As we have already pointed out, a coordinated effort among all the members of the surgical team for a timely and efficiently hemostasis with the monopolar diathermocoagulation is of the utmost importance. This will result in shorter operative time and identical incidence of bleeding complications when compared with electrosurgery.

Concerning the patient discharge, it is important to notice that our standard management was to discharge only if the collection per day is <30 mL per drain. We are aware that it differs in other centers, namely in other countries, where patients are discharged the day after surgery and drains are removed at the office. On the other hand, keeping patients in the hospital makes the study more accurate,

Table 5. Studies on Dissection Technique (Scalpel vs Diathermocoagulation) and Abdominoplasty

	Araco et al ³⁵	Rousseau et al ³⁴	Present Study
Type of study	Retrospective	Retrospective	Prospective
Total no. patients	137	647	119
No. patients submitted to abdominoplasty with scalpel	47	320	39
No. patients submitted to abdominoplasty with electrocautery	90	327	80
Diathermocoagulation mode	NA	Cutting	Coagulation
Drain volume reduction	NA	22% decrease with scalpel†	55% decrease with scalpel*†
Earlier drain removal	NA	1 d	2 d*†
Operative time	NA	Increase with scalpel†	NS
Seroma	NS	Decrease with scalpel†	0 cases with scalpel (81% decrease)
Hematoma/bleeding	Increase with scalpel (1.1% vs 12.8%)	Decrease with scalpel†	NS
Wound healing problems	NS	NS	0 cases with scalpel (90% decrease)

* $P < 0.0001$.

†Noninfectious collections (hematoma and seroma) were reduced in 42.85% with scalpel dissection.

‡The criteria for drain removal were 15 mL/24-hour period per drain in the study by Rousseau et al³⁴ and 30 mL/24-hour period in the present study.

NA, not available; NS, not significant ($P > 0.05$).

because drain output is accurately and professionally measured.

Obesity and the presence of comorbidities, like hypertension or diabetes mellitus, are known risk factors for complications after abdominoplasty. Many studies have reported higher incidence of seroma, hematoma, and wound infection in those situations.^{5,35,47,48} In this study, the 2 groups had statistical differences concerning BMI, presence of comorbidities, and surgical specimen weight, with higher values in the scalpel group. Poor outcomes were expectable for the scalpel group, especially concerning local complications. It is of true relevance to point that in spite of these differences, the scalpel dissection still presented significantly better outcomes.

In an era of diminishing the costs and morbidity, it is important to highlight all the strategies that could improve the outcomes and complications of a full abdominoplasty.

The ideal dissection technique is the one that gives a bloodless and precise dissection, causing minimal complications, including seroma and hematoma incidence. The scalpel has proved to have real benefits. To the authors' knowledge, this is the first prospective study that compares the 2 main techniques of raising an abdominal flap during a full abdominoplasty, showing better outcomes with scalpel dissection.

Creating a study that eliminates all the independent variables is desirable but often impossible. Despite the results of statistical analysis, different surgical teams could be a factor that influenced the results of our study. As was stated before, the patients were allocated according to the department's policy, that is, they were sequentially distributed according to the list of patients presenting for a plastic surgery consultation and respecting all the exclusion criteria. So, the fact of being a nonrandomized study could also be a limitation. Notwithstanding this limitation, we think these data are interesting and deserve to be shared among the plastic surgeons.

This study could have clinical and experimental implications. Further clinical studies are needed to evaluate the benefits of combining dissection with scalpel and other abdominoplasty tips/techniques, namely Scarpa fascia preservation or internal fixation techniques. The benefits of the steel scalpel that were demonstrated in this study could also be a base for experimental trials to improve the specifications of the dissection tool, namely reduction of the thermal injury that is still observed with electro-surgery.

CONCLUSIONS

This prospective study shows real advantages of performing dissection with scalpel in a full abdominoplasty, namely a significant reduction of

the time required for suction drains removal, reduction of the total drain output, and reduction of seroma rate and wound healing problems, when compared with diathermocoagulation dissection on coagulation mode.

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